Public Health England

Protecting and improving the nation's health

Cost-effective commissioning of end of life care

User guide for the end of life economic analysis tool

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. We do this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health, and are a distinct delivery organisation with operational autonomy to advise and support government, local authorities and the NHS in a professionally independent manner.

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Published February 2017
PHE publications gateway number: 2016582

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Context and general information

This document provides a step-by-step guide to the end of life economic tool developed for Public Health England (PHE) by Optimity Advisors.

The creation of this tool was commissioned by PHE and has been shaped by the recommendations of the steering group and the availability of data and evidence to populate the model. It is aimed at end of life care programme leads and commissioners who are interested in health and social care interventions for patients at the end of their lives.

After presenting a literature review to the steering group, it was agreed that the economic tool would explore the trade-offs associated with shifting care from an acute setting to a primary, community and/or social care setting, due to the uncertainty around the costs and impacts of alternative interventions and services for patients at the end of their lives. The interventions do not have complete information on effect or cost saving and only two interventions have some incomplete information available. The tool is therefore not designed to provide commissioners with a definitive answer regarding which interventions should be commissioned or is the tool designed to assess the practicality of implementing given interventions; elements such as other existing policies, capacity, process and people must also be considered. Instead, it presents the user with an assessment of the potential net financial implication of such shift in activities.

It is of great importance for decision-makers to consider the potential improvement, or indeed the potential decline, in the quality and safety of care, and patient experience, in conjunction with the net financial implication, when considering the implemention of interventions. A neutral or positive net financial implication alone should not be the only determinant. Moreover, it is essential for decision-makers to consider whether or not the current capacity of care provision can adequately cope with a potential influx of primary, community and social care activities.

There are several reasons for using this end of life economic tool when considering whether or not to commission given interventions. This tool provides the opportunity to assess the net financial implication to each organisation that will be affected when the interventions are implemented, whilst taking into account the funding arrangements of the services, thereby providing the opportunity to assess the financial feasibility of co-financing arrangements for several primary, community and social care services. This may be useful when considering co-commissioning opportunities and incentives across organisational boundaries. Measures such as current expenditure from the number of days spent in hospitals arising from emergency and non-emergency admissions, the number of deaths, and the percentage of deaths in hospital provide context.

Furthermore, this tool provides information on the magnitudes of potential increases in primary, community and social care demands and costs, which give an indication of whether

existing infrastructure or other resources can manage such increases in activities. The potential financial implication for patients and/or their families has also been incorporated, illustrating how the actions of service providers (NHS England, CCGs, local authorities, and voluntary organisations) can impact on patients and/or their families. This aspect emphasises the importance of considering wider incentives rather than purely focusing on financial incentives for public sector organisations alone.

Introduction

A literature review has been conducted regarding interventions related to end of life care. There are two major parts in the tool: a summary (Intervention Summary) that has been developed so the user can select an intervention from a drop-down menu and view the evidence gathered via the literature review and the summary of which will appear on the page, and an analysis on cost-shifting from secondary care to primary, community and social care.

In several cases, the aims of the interventions are to improve patient experience by reducing secondary care utilisation. Secondary care is likely to be more costly when compared to primary, community and social care. However, a reduction in secondary care utilisation is likely to result in increases in the use of primary, community and social care services. Hence, the second part of the tool is designed to estimate the net financial implications of the interventions, given an expected reduction in secondary care utilisation, the interventions' investment costs, and any subsequent increase in primary, community and social care utilisation. It is important to note that, when assessing the financial implications, this tool does not consider the means and practicality of implementing interventions in a local context.

For the purposes of this tool, the primary, community and social care services considered are:

- residential home care
- nursing home care
- hospice care
- GP consultations
- out-of-hours GP consultations (urgent and emergency)
- district nurse visits
- home care
- informal care (spouse/family, etc)
- community palliative nurse visits (eg as provided by Marie Curie)
- specialist community palliative care contact team visits (community-based hospice care)
- voluntary care from a third sector organisation

This list is not exhaustive. However, it includes a broad range of alternatives to secondary care services for end of life care, with a similarly broad range of costs.

The results generated by the activity and cost-shifting analysis are displayed in the cost-shifting analysis results tabs. These need to be carefully interpreted and with caution: whether the potential savings can be turned into genuine financial savings depends on factors such as local operational decisions. For example, some fixed (and/or variable) costs may not be reduced immediately: the interventions may result in decreased secondary care activities, which will not necessarily lead to cash release due to fixed costs (building, facilities etc).

In the **introduction** tab of the spreadsheet, the user selects a geographical area (eg a CCG or England as a whole) and an illness category from the drop-down menus (cells C11 and C12 respectively). The selections of geographical area and illness category will allow the tool to use area- and illness-specific information when conducting calculations.

The illness categories are, for the purpose of this tool, the following:

- Cancer (ICD10 C00-C97)
- circulatory disease including heart disease and stroke (ICD10 I00-I99)
- Alzheimers disease and dementia (ICD10 F01, G30, R54)
- respiratory disease (ICD10 J00-J99)
- external Causes (ICD10 V00-Y89 and U509)
- all others (Neo-natal deaths were excluded for the data)
- all of the above

Figure 1: Select a CCG

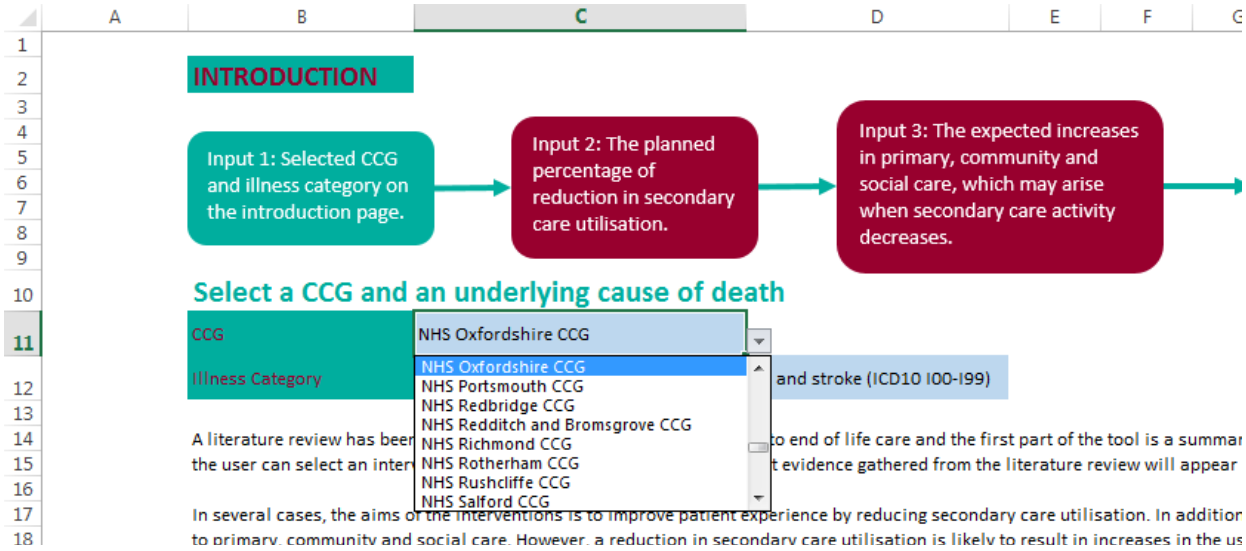
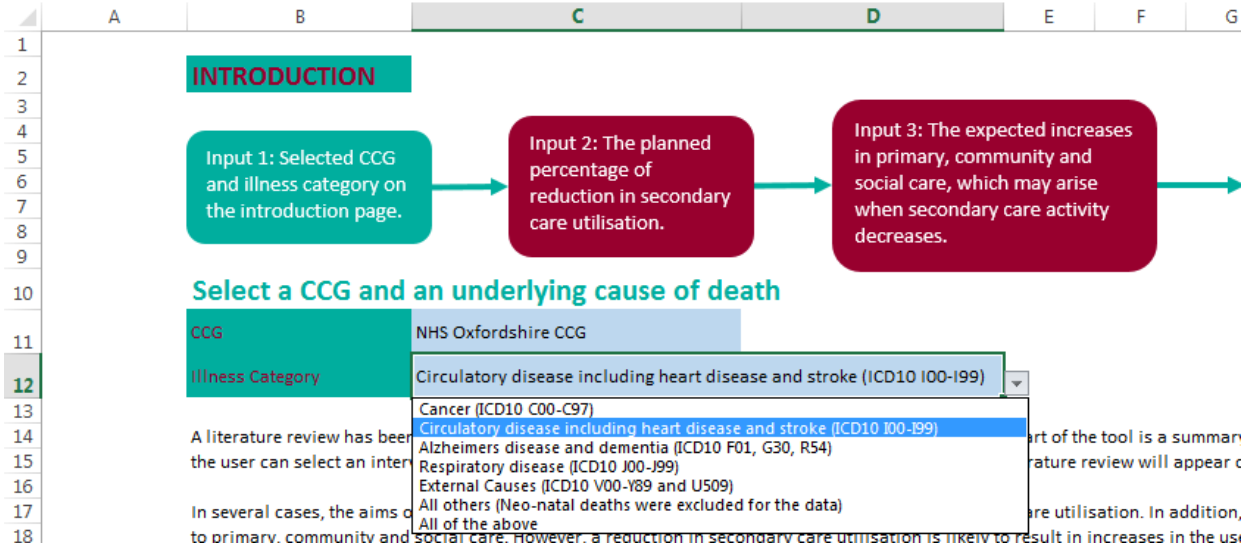


Figure 2: Select an illness category



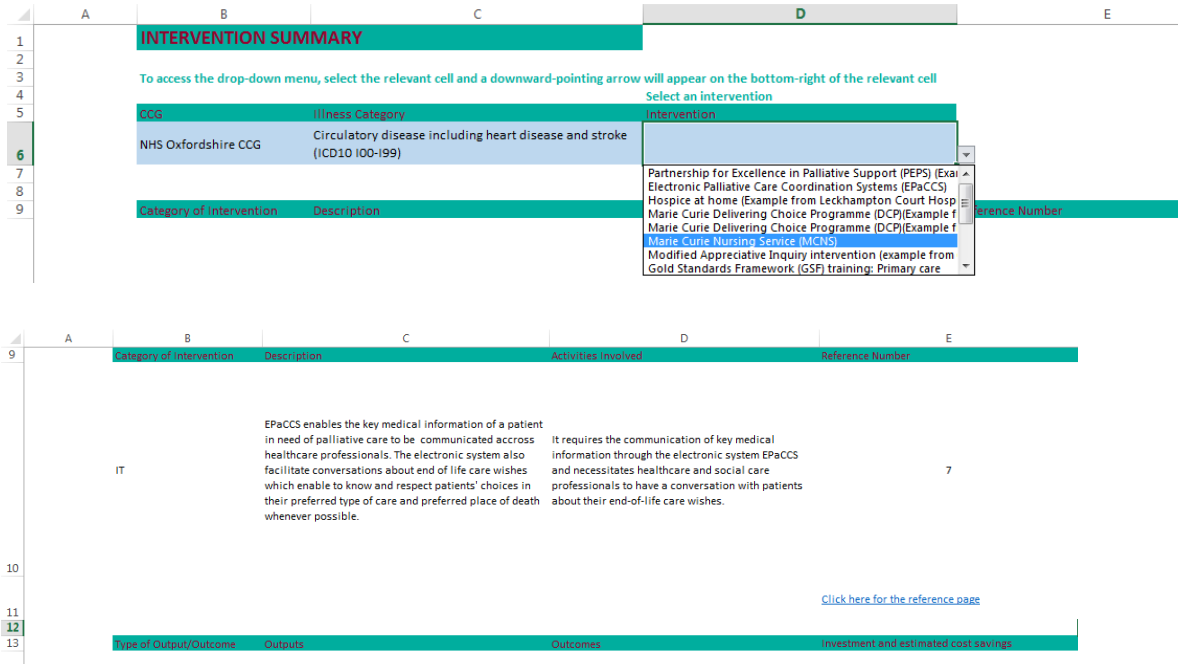
Intervention summary

This MS Excel tab provides a summary of the relevant information extracted from the studies included in the literature review. The information provided from the selected interventions are:

- category of the selected intervention (eg IT, training, etc)
- a description of the intervention
- the activities associated with the intervention
- reference number(s) of the intervention (a list of references is on a separate tab)
- type of output and outcomes
- quantification of the output
- characteristics of the outcome
- necessary investment and estimated cost-savings

From the drop-down menu of the **Intervention summary** tab (cell D6), the user selects an intervention. Once the intervention has been selected, a summary of the selected intervention from the literature will appear on the page. This information can be used either as standalone information, to develop the commissioner's understanding of the costs and impacts of the interventions, or it can be used to help inform and contextualise the information generated by the remainder of the tool, i.e. the economic analysis tool.

Figure 3: Select an intervention



Cost-shifting analysis input

In the **Cost-shifting analysis input** tab, where the inputs of the activity and cost-shifting analysis are located, the user is required to enter the expected percentage(s) of reduction in secondary care utilisation. This is done by selecting, from the 'interventions that reduced secondary care utilisation' drop-down menu (cell D27), either an intervention that has a documented percentage reduction (The Partnership for Excellence in Palliative Support (PEPS) or Marie Curie DCP (Delivering Choice Programme), Somerset) or the 'User to enter values' option. If the user wishes to enter his or her own percentages of reduction, enter these in the corresponding cells in input 2.2 column E. Column D of input 2.2 shows the 2013-2014 statistics used within this model.

Figure 4: Select an intervention or choose to enter your own values

2. Expected Reduction in Secondary Care Utilisation

2.1	Please select an interventions for which data is available or enter your own values	User to Enter Values

If interventions are selected in cell D27, the reductions apply only to emergency admissions. To override the percentage reduction(s) for emergency and non-emergency admissions, enter indicative percentage reduction(s) in column E in table 2.2..

If "User to Enter Values" is selected in the cell D27's drop-down menu, enter a percentage of reduction you plan to achieve based on your understanding of the interventions and their logic models.

2.2	End-of-Life Secondary Care Utilisation	Average Annual Number of Activities from 2013 to 2015	Percentage of Yearly Reduction in Secondary Care Utilisation Based on a selected Intervention	User Input of Yearly Percentage Reduction
	Number of Emergency Admissions	8,333		10%
	Average Length of Inpatient Stay from Emergency Admissions (in Days)	11		10%
	Number of Non-Emergency Admissions	2,171		
	Average Length of Inpatient Stay from Non-Emergency Admissions (in Days)	18		

There may be a time lag between the start of interventions and the realisation of reductions in secondary care activities. Therefore the user is asked to enter in how many years' time the benefits are expected to come on stream (benefits-starting year) in input 2.3. The user is also expected to enter the number of years the interventions are expected to run (intervention-ending year) in input 2.4. These two values should be between 1 and 10 inclusive; the benefits-starting year must be less than or equal to the intervention-ending year. These inputs provide a time period during which the expected reductions in secondary care activities occur.

Figure 5: Indicate when the benefits of the intervention will come on stream and the planned duration of the intervention

2.3	In how many years do you expect the benefits to come on stream?	2	Default setting is 1 year (immediate impact) assuming now is year 0. If desired, enter the number of years after intervention that the benefits will come on stream
2.4	How long do you expect the project to span, in years?	4	No default setting. This must be between 1 and 10 inclusive.

Since patients are spending less time in secondary care, it is likely that they will be spending more time in other care settings (ie the interventions are likely to have been designed to divert activities away from presumably more costly inpatient secondary care). This tool allows the user to choose from the following alternative care setting options:

- home,
- residential home,
- nursing home, and
- inpatient stays in hospice.

The total number of secondary inpatient days reduced, at the end of the benefit-starting year, will be shown in cell D45. Based on this information and/or the interventions' logic model, the user is asked to enter what proportion of patients are expected to be in these alternative care settings or accommodation in input 3.1, in terms of population average.

Figure 6: Indicate the proportion of days in hospital averted that are spent in various accommodation

3. Activity Increases in Primary, Community and Social Care

Based on inputs from input 2 around the expected reduction in secondary care utilisation and at the year when the interventions' benefits are expected to come on stream.

Annual Total Number of Days in Hospital Averted at the Year When Benefits are Expected to Come On Stream Based on the 2013-2015 Data	17,773

What proportion of the days do patients spend at the below accommodation whilst out of hospital? Enter the proportion of days in percentages

3.1	Location of Patient Stays for Days in Hospital Averted	Proportion of Days	
	Home	50%	This option does not attract a residential cost but in input 3.2, there are options to increase their care received.
	Residential Home	30%	This option have a cost of care associated with them; the costs are documented on the Optional Input page)
	Nursing Home	20%	This option have a cost of care associated with them; the costs are documented on the Optional Input page)
	Inpatient Days in Hospice	0%	This option have a cost of care associated with them; the costs are documented on the Optional Input page)

The care and accommodation costs associated with residential home care, nursing home care and inpatient hospice care are known. However, for patients who would spend time at home, other primary, community and social care services may also be accessed.

If the proportion of patients who stay at home is not zero, the user is asked to enter the expected demand for primary, community and social care services for a 'typical' patient living at home (average activity per patient) for a given average 'extra' number of days out of hospital per patient. The extra number of days spent at home arising from avoided admissions per patient is shown in cell D57, and based on this number, the corresponding additional service utilisation should be entered in table 3.2. Table 3.2 relates to cell D57. When entering additional activities, the user should enter the utilisation in the unit given by the table headings.

Figure 7: For patients who avoided admission and staying at home, enter the expected primary, community and social care utilisation per patient, given the average number of days the patient will now spend at home instead of in a hospital.

For those who avoid admissions and stay at HOME, the average inpatient days avoided per patient is	5

3.2 For a Typical Patient Staying at HOME Who Avoided Admissions, the Additional Services to be Utilised during the 5 day(s)	Number of Visits	Number of Hours
GP Consultations	1	
Out-of-Hours GP Consultations (Urgent and Emergency)	2	
District Nurse		5
Care at Home provided by a Home Care Worker		10
Informal Care (Spouse/Family etc.)		2
Community Palliative Nursing Contact (e.g. as provided by Marie Curie)		2
Specialist Community Palliative Care Contact Team (Community-Based Hospice Care)		
Volunteer from a Third Sector Organisation		

Informal care hours accounts for the lost employment opportunity. For example, a person has to abandon employment in order to care for an end-of-life patient.

The time spent at home per patient arising from reduced average length of stay from hospital admissions are shown in cell D69, and based on this number, the corresponding additional service utilisation should be entered in table 3.3. Table 3.3 relates to cell D69. When entering additional activities, the user should enter the utilisation in the unit given by the table headings.

Figure 8: For patients who were admitted (with a reduced length of stay) and staying at home, enter the expected primary, community and social care utilisation per patient, given the average number of days the patient will now spend at home instead of in a hospital.

For those who has reduced average length of stay (still admitted), the average inpatient days avoided per patient is	0

3.3 For a Typical Patient Staying at HOME, the Additional Services to be Utilised during the 0 day(s)	Number of Visits	Number of Hours
GP Consultations		
Out-of-Hours GP Consultations (Urgent and Emergency)		
District Nurse		
Care at Home provided by a Home Care Worker		
Informal Care (Spouse/Family etc.)		
Community Palliative Nursing Contact (e.g. as provided by Marie Curie)		
Specialist Community Palliative Care Contact Team (Community-Based Hospice Care)		
Volunteer from a Third Sector Organisation		

Informal care hours accounts for the lost employment opportunity. For example, a person has to abandon employment in order to care for an end-of-life patient.

Note that the units of the services shown differ and the column in which the user needs to enter the demand depends on the service.

In addition, due to the funding nature of residential and nursing homes and the number of patients who are eligible for state support in these two care settings, the user is asked to

consider the whether the default percentages of patients who receive state support and patients who do not receive state support reflect their local area in input 3.4. If the user decides that the default percentages do not reflect the selected local area, they can enter their own percentages in the corresponding cells in columns F and column G.

Figure 9: The proportion of patients who are eligible and not eligible for state support if they are to stay in residential and nursing homes.

	C	D	E	F	G
	Volunteer from a Third Sector Organisation				

Patients who stay in either a residential or nursing home are either self-funding their care, or local authorities and/or NHS England partially or wholly fund their care.
Due to the funding structures for residential and nursing homes, this table shows the proportion of people who are supported by Local Authorities and that of patients self-funding
To override the default proportions, the user can enter their own proportions in the corresponding cells

3.4	Location	Default Proportion of Patients Receiving Local Anuthority Support	Default Proportion of Patients Self-Funding	User-Input Proportion of Patients Receiving Local Anuthority Support	User-Input Proportion of Patients Self-Funding
	Residential Home	50%	50%		
	Nursing Home	50%	50%		

The user is then asked to enter any additional investment required to set up the intervention as well as an estimated extra yearly operational cost, if appropriate. The investment costs should be entered for each funding organisation in input 4.1 OR as an overall investment value in input 4.2, but NOT both.

If the investment is entered for each funding organisation in input 4.1, the change in financial position in the results for each organisation and across all organisations will incorporate this investment. However, if the investment is entered as an overall value in input 4.2, ONLY the change in financial position across all organisations will incorporate this investment, and NOT for each organisation.

Figure 10: Enter the investment by funding organisation as a one-off initial investment and a yearly operational cost in input 4.1. If the investment is not entered by organisation, enter into input 4.2 as an overall value. User must NOT enter investment in BOTH inputs. Note: Overall change in financial position of funding organisation will not be available if input 4.1 is blank.

4. Investment

Enter an investment value in the relevant cell in table 4.1 based on how much the interventions are expected to cost each organisation IF KNOWN, if NOT KNOWN, enter the total in the User-Input row in input 4.2 below and leave input 4.1 BLANK

4.1	Funding Organisations	Initial (One-Off) Investment Cost	Estimated Operational Cost per Year
	NHS England	£100,000	£50,000
	CCG	£100,000	£50,000
	Local Authority	£100,000	£50,000
	Voluntary Sector		

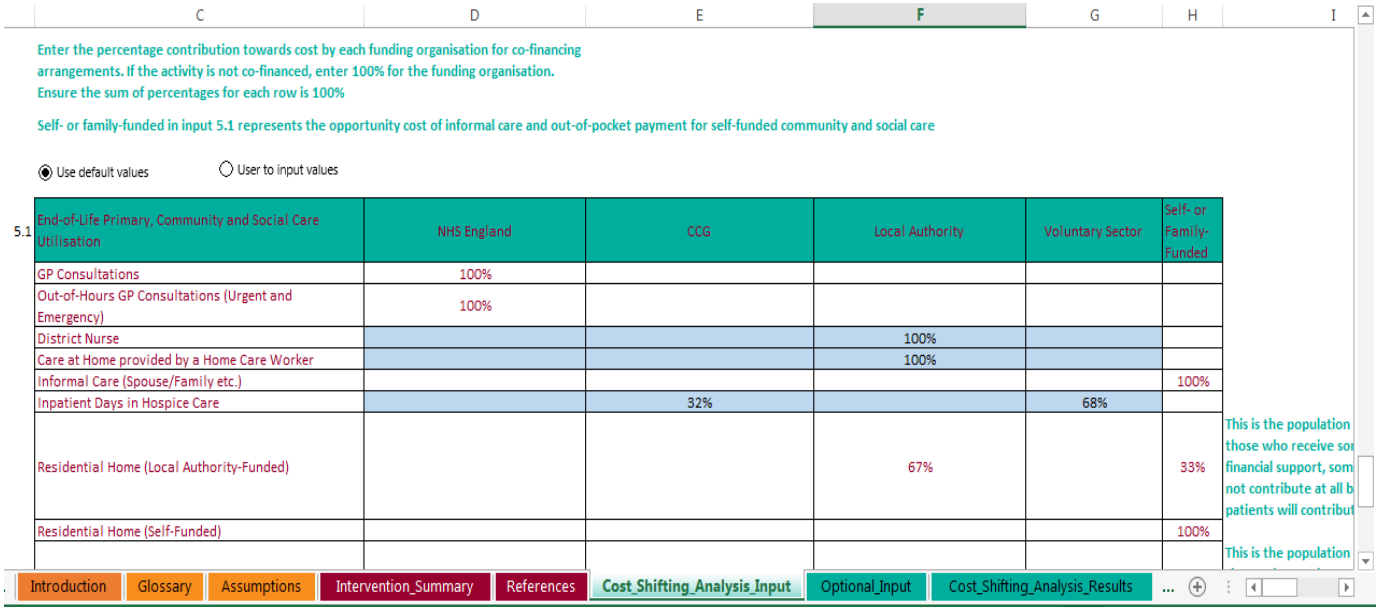
If the user has entered the investment by funding organisation in input 4.1, leave input 4.2 BLANK

4.2	Total investment	Initial (One-Off) Investment Cost	Estimated Operational Cost per Year
	Based on the Values Entered Above	£300,000	£150,000
	User Input if Funding Organisations are Unknown		

Furthermore, there is an option for the user to consider the possibility for the primary, community and social care services to be co-financed by different organisations (input 5.1). There are default values, which reflect or close describe normal funding arrangements

However, if the user wishes to use his or her own values, they should click on the option button named ‘User to input values’ in cell C111, and enter the percentages in the relevant cells, although not all funding arrangements can be overridden. If the user wishes to revert to the default values, simply click on the option button named ‘Use default values’ in cell C111. For example, the cost of nursing homes (local authority- and NHS England-funded) is funded by local authorities (46%), NHS England (23%) and patients or their families (31%). If the user does not wish the activities concerned to be co-funded, simply enter 100% for the relevant funding organisation.

Figure 11: Opportunity to set the funding contribution of activities by funding organisation.



Enter the percentage contribution towards cost by each funding organisation for co-financing arrangements. If the activity is not co-financed, enter 100% for the funding organisation.
Ensure the sum of percentages for each row is 100%

Self- or family-funded in input 5.1 represents the opportunity cost of informal care and out-of-pocket payment for self-funded community and social care

◉ Use default values ○ User to input values

5.1 End-of-Life Primary, Community and Social Care Utilisation	NHS England	CCG	Local Authority	Voluntary Sector	Self- or Family-Funded
GP Consultations	100%				
Out-of-Hours GP Consultations (Urgent and Emergency)	100%				
District Nurse			100%		
Care at Home provided by a Home Care Worker			100%		
Informal Care (Spouse/Family etc.)					100%
Inpatient Days in Hospice Care		32%		68%	
Residential Home (Local Authority-Funded)			67%		33%
Residential Home (Self-Funded)					100%

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Introduction | Glossary | Assumptions | Intervention_Summary | References | Cost_Shifting_Analysis_Input | Optional_Input | Cost_Shifting_Analysis_Results

The model comes pre-populated with the standard unit costs of the different services, discount rate and an assumption about the annual increase in service demand. However, these can be overridden in the **Optional input** page by entering the user’s own unit costs into column D. If the user does not wish to override the default unit costs, discount rate and annual service demand growth rate, leave BLANK.

It should be noted that the user must enter a unit cost for the unit cost of the Specialist community palliative nursing contact team (Community-Based Hospice Care). This is on the advice of specialist experts in the field. However, in the absence of local data, users might wish to use the unit costs associated with the community specialist palliative nursing care (eg as provided by Marie Curie) option, which, based on evidence from Marie Curie Cancer Care, is £77 per hour.

Figure 12: Override the default cost if you wish to. The activity labelled 'Specialist community palliative nursing contact team (Community-Based Hospice Care)' MUST be assigned a unit cost if the expected increase in activity is non-zero.

For both cost-shifting analysis

Enter a unit cost if you wish to override the default value

Cost of Services	Default Unit Cost	User Input Unit Cost	Source	Comments
Inpatient Day in End-of-Life Emergency Admission	£253.91		PSSRU 2015 in conjunction with end-of-life care data provided by PHE (summary HES, Mortality Statistics by CCG 2013-2015 PHE Data Lake: Linked Hospital Episode Statistics-ONS Mortality Data and ONS Mortality Database)	
Inpatient Day in End-of-Life Non-Emergency Admission	£307.35		PSSRU 2015 in conjunction with end-of-life care data provided by PHE (summary HES, Mortality Statistics by CCG 2013-2015 PHE Data Lake: Linked Hospital Episode Statistics-ONS Mortality Data and ONS Mortality Database)	
GP Consultation	£44.00		PSSRU 2015	The unit cost for a GP consultation varies depending on duration and mode. The default unit cost is for a GP contact (not telephone contact) lasting 11.7 minutes (with qualifications and including direct care staff costs).
Out-of-Hours GP Consultation (Urgent and Emergency)	£68.97		Adapted from Out-of-hours GP services in England, National Audit Office (2014)	Based on the cost of out-of-hours GP services and the number cases handled
Hourly cost of District Nurse Contact	£78.00		Understanding the cost of end of life care in different settings (2012), Marie Curie Cancer Care PSSRU 2010, p. 159	
				As the PSS EX1 return (Personal Social Services:

The above selections will allow the results to be populated, and by understanding the results, the user can iteratively re-analyse different scenarios.

Cost-shifting analysis results

The **Cost-shifting analysis results** tab (where the results of the activity and cost-shifting analysis are located) is populated based on the selections made in the Introduction, Cost-shifting analysis input and Optional input pages. The number of deaths, percentage of death in hospital, and the current annual cost of number of days spent in hospitals arising from emergency and non-emergency admissions, shown in Table 1, are based on the activity data provided by PHE, linked to the selected CCG and illness category, and unit costs for a day in emergency and non-emergency admissions, either derived from PSSRU 2015 or entered by the user.

Figure 13: Information regarding the number of deaths, percentage of deaths in hospital, and average annual cost of number of days spent in hospital arising from emergency and non-emergency admissions based on data from 2013-2014.

B C D E

The potential "costs" and "savings" generated in this analysis are the monetary values of the activities; calculated using reference costs. How these savings, if any, are realised is a matter of local operational decision.

1. Selected CCG and illness category

CCG	NHS Oxfordshire CCG
Illness Category	All of the above

The number of deaths in 2013-2014 based on the selected CCG and illness category. Source: PHE.

Number of Deaths	Percentage of Deaths in Hospital	Current Annual Cost of Number of Days Spent in Hospitals Arising from Emergency and Non-Emergency Admissions
5,283	44%	£34,073,279

Once the reductions in secondary care utilisation start to come on stream, primary, community and social care utilisation will increase. Table 2 shows the expected activity and cost increases in primary, community and social care based on the inputs indicated by the user in input 2 and input 3.

Figure 14: The expected in utilisation in primary, community and social care.

2. The expected increase in primary, community and social care activities

The table below shows the expected increase in activity level in primary, community and social care.

Primary, Community and Social Care Service	Comment	Expected average monthly activity increase for all patients in the 4 years during which the intervention(s) will be implemented	Expected average annual activity increase for all patients in the 4 years during which the intervention(s) will be implemented	Expected total increase in activity (cumulative) for all patients in the 4 years during which the intervention(s) will be implemented	Total increase in cost (cumulative) for all patients in the 4 years after the implementation of intervention(s)
Home	Number of weeks at home	109	1,308	3,924	£0
Residential Home (Local Authority-Funded)	Number of weeks in residential home	33	392	1,177	£550,526
Residential Home (Self-Funded)	Number of weeks in residential home	33	392	1,177	£712,566
Nursing Home (Local Authority- and NHS England-Funded)	Number of weeks in nursing home	22	262	785	£477,582
Nursing Home (NHS England- and Self-Funded)	Number of weeks in nursing home	22	262	785	£585,609
Inpatient Days in Hospice Care	Number of days in hospice care	0	0	0	£0
GP Consultations	Number of GP consultations	76	911	2,733	£108,410
Out-of-Hours GP Consultations (Urgent and Emergency)	Number of out-of-hours consultations	152	1,822	5,465	£339,843
District Nurses	Number of hours of district nursing care	380	4,554	13,663	£960,907
Care at Home provided by a Home Care Worker	Number of hours of care at home	759	9,108	27,325	£591,327

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As the interventions have the potential to shift activities from secondary care into primary, community and social care, some organisations will see an increase in costs, whilst others will see a reduction. The aim of this tool is to demonstrate the potential financial implications on these organisations.

Table 3 shows the overall change in financial position of various funding organisations, taking into consideration their initial investment (if entered in input 4.1 and not input 4.2) and each of their financial contributions to primary, community and social care activities, at the intervention-ending year (input 2.4). Negative values denote potential additional expenditure and positive values denote potential additional savings.

Figure 15: The net change in financial position of the parties involved, the public sector, and the system as a whole.

B C D E

3. The overall change in financial position of funding organisations

WARNING: If the investment on the cost-shifting-analysis-input page was NOT entered by funding organisation but as a **TOTAL** investment, the investment cost will **NOT** be included in the change in financial position for each organisation (3.1 and 3.2), but they will include the investment by organisation if the investments were entered by organisation. **HOWEVER**, the overall investment value will be included in the net-present-value box 3.3 below, whether or not the investment values were entered in input 4.1 or 4.2.

Positive values denote potential savings

3.1	Net Present Value of Public Sector organisations 4 years after implementing interventions	£8,791,467

At the intervention-ending year, 4 years after the implementation of interventions

	Funding Organisations	Change in Financial Position from Start of Intervention to Expected Break-Even Year	Average Annual Change in Financial Position from Start of Intervention to Expected Break-Even Year
3.2	NHS England	-£952,893	-£238,223
	CCG	£12,171,612	£3,042,903
	Local Authority	-£2,427,251	-£606,813
	Voluntary Sector	-£258,016	-£64,504
	Self- or Family-Funded	-£1,549,412	-£387,353

A negative net present value means that it has a negative net cost implication for the discount rate and assumptions applied.

3.3	Net Present Value 4 years after implementing the interventions	£6,984,039

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Chart 1 displays the net financial position across all stated funding organisations. Beyond the intervention-ending year, a projection is made based on the expected yearly reduction secondary care activities, investment made and the expected increase in primary, community and social care utilisation.

Figure 16: The projected overall cost, from the system's perspective, if the intervention run beyond its planned duration.

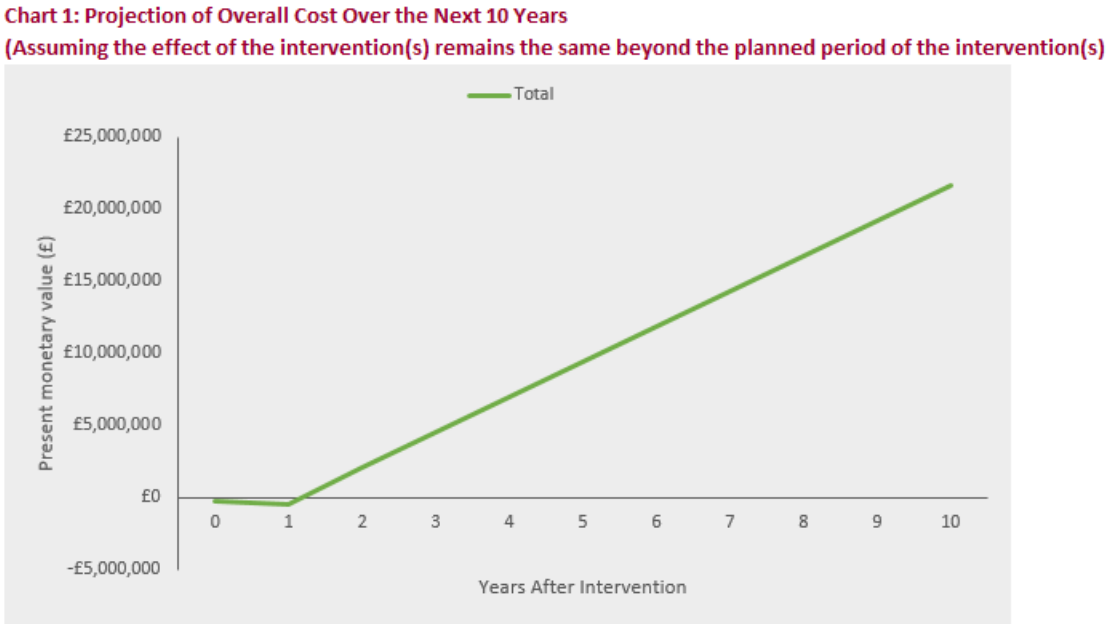
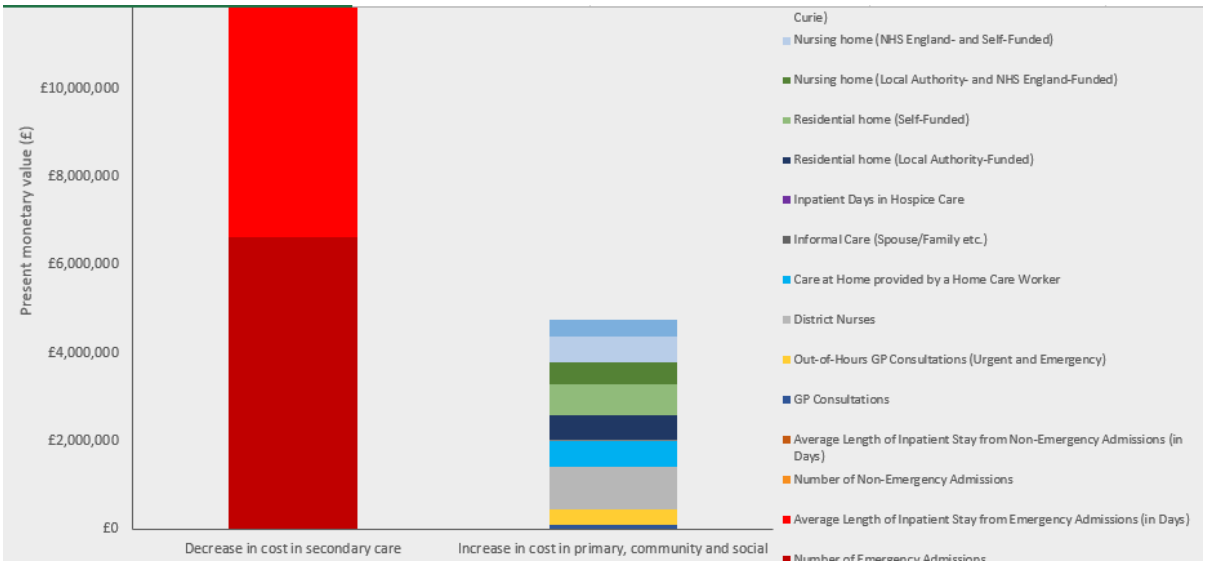


Chart 2 displays the expected total decrease in cost of secondary care and the expected total increase in cost of primary, community and social care from when the intervention is implemented until the intervention-ending year.

Figure 17: The decrease in cost and the increase in cost at the end of the intervention's planned duration.



It is important to note that the potential savings from reduced secondary care utilisation and increases in primary, community and social care utilisation are calculated using the monetary value of the reduction or increase in the number of activities. These monetary values are calculated based on how much it costs to deliver an activity. Whether these changes in monetary value can be turned into genuine financial savings depends on various external factors such as the ability of local organisations to reduce capacity, including fixed costs such as building costs.

Activity and cost-shifting analysis assumptions

Input page

1. For funding default values, nursing homes are made up of residential homes plus nursing services. The residential part of nursing homes is paid for by local authorities and the nursing part are paid for by NHS England.
2. For each activity reduced, the potential saving is what it costs to deliver this activity, known as monetary value of the activity in this tool.
3. The savings obtained as a result of reduced secondary care utilisation are directly transferable for spending in primary, community and social care.

Optional inputs

1. Unit costs for emergency and non-emergency admissions are on a per death basis with a sample of 73,243. In order to convert them into per activity or time basis, the per-death values are multiplied by the number of deaths nationally and divided by the number of activities or days nationally.
2. A discount rate of 3.5% is used as the default value for time-related monetary calculations; this is the standard treasury rate.
3. An annual activity growth rate of 3% is used as the default value. This can be amended to reflect local demographic conditions.

Intervention References

Reference Number	Reference Name	Intervention Discussed in Paper
33	Deloitte. 2012. The economic impact of care in the home services; A report commissioned by the British Red Cross. British Red Cross	British Red Cross Schemes
23	Noble, B., King, N., Hughes, P., Winslow, M., Melvin, J., Brooks, J., Bravington, A., Ingleton, C., Bath, P. 2012. Evaluation of the Midhurst Macmillan Specialist Palliative Care Service (Real Choice Project): A community consultant-led palliative care service.	Consultant led multi-disciplinary team (Example from Midhurst)
47	NHS Improving Quality. 2013. Economic Evaluation of the Electronic Palliative Care Coordination System (EPaCCS) Early Implementer Sites. NHS Improving Quality	Electronic Palliative Care Co-ordination Systems (EPaCCS)
24	GSF - Overview of the work of the National GSF Centre in End of Life care.	Gold Standards Framework (GSF) training: All 10 existing programmes
21	Stobbart-Rowlands, 2015. Bradford, Airedale and Craven GSF Care Homes Training Programme Evaluation Report.	Gold Standards Framework (GSF) training: Care Home (example from Bradford, Airedal and Craven)
20	Clifford, C., Thomas, K., Armstrong-Wilson,J. End of Life Care in Primary Care: The Gold Standards Framework, Going for Gold service improvement programme and Accreditation process (Paper currently in publication).	Gold Standards Framework (GSF) training: Primary care
36	Wood C, Salter J. 2013. A time and a place; what people want at the end of life. Sue Ryder	Hospice at home (Example from Leckhampton Court Hospice at home service)
28	Addicott R, Dewar S. 2008. Improving choice at end of life; A descriptive analysis of the impact and cost of the Marie Curie Delivering Choice programme in Lincolnshire. King's Fund	Marie Curie Delivering Choice Programme (DCP) (Example from Lincolnshire)

26	Wye L, Lasseter G, Percival J, Simmonds B, Duncan L, Purdy S. 2012. Independent Evaluation of the Marie Curie Cancer Care Delivering Choice Programme in Somerset and North Somerset. University of Bristol	Marie Curie Delivering Choice Programme (DCP) (Example from Somerset)
40	Georghiou T, Bardsley M. 2014. Exploring the cost of care at the end of life; Research report. Nuffield Trust	Marie Curie Nursing Service (MCNS)
27	Chitnis X, Goerghiou T, Steventon A, Bardsley M. 2012. The impact of the Marie Curie Nursing Service on place of death and hospital use at the end of life; Research report. Nuffield Trust	Marie Curie Nursing Service (MCNS)
19	Amador, S., Goodman, C., King, D., Ng, Y.T., Elmore, N., Mathie, E., Machen, I., Knapp, M., 2014. Exploring resource use and associated costs in end of life care for older people with dementia in residential care homes. Int J Geriatr Psychiatry 29, 758–766.	Modified Appreciative Inquiry intervention (example from 6 residential care homes in the East of England)
15	Higginson I, McCrone P, Hart SR, Burman R, Silber E, Edmonds PM. 2009. Is Short-Term Palliative Care Cost-Effective in Multiple Sclerosis? A Randomized Phase II Trial. Journal of Pain and Symptom Management; 38:6: 816-826	Multi-professional palliative care team (PCT) for people with multiple sclerosis (Example from South East London)
17	Sue Ryder. 2013. Partnership for Excellence in Palliative Support (PEPS). Evaluation of pilot. Sue Ryder Evaluation Series: Report No. 2	Partnership for Excellence in Palliative Support (PEPS)
36	Wood C, Salter J. 2013. A time and a place; what people want at the end of life. Sue Ryder	Partnership for Excellence in Palliative Support (PEPS) (Example from initiative led by Sue Ryder and NHS Bedfordshire)
18	York Health Economic Consortium, 2016. Economic Evaluation of the Gold Line: Health Foundation Shared Purpose project, Airedale NHS Foundation Trust	The Gold Line (Example from Airedale, Wharfedale and Craven CCG area).

Cost-shifting analysis cost data sources

Service	Default Unit Cost	Source	Comment
Inpatient Day in End of Life Emergency Admission	£253.91	PSSRU 2015 in conjunction with end of life care data provided by PHE (summary HES, Mortality Statistics by CCG 2013-2015 PHE Data Lake: Linked Hospital Episode Statistics-ONS Mortality Data and ONS Mortality Database)	
Inpatient Day in End of Life Non-Emergency Admission	£307.35	PSSRU 2015 in conjunction with end of life care data provided by PHE (summary HES, Mortality Statistics by CCG 2013-2015 PHE Data Lake: Linked Hospital Episode Statistics-ONS Mortality Data and ONS Mortality Database)	
GP Consultation	£44.00	PSSRU 2015	
Out-of-Hours GP Consultation (Urgent and Emergency)	£68.97	Adapted from Out-of-hours GP services in England, National Audit Office (2014)	Based on the cost of out-of-hours GP services and the number cases handled
Hourly cost of District Nurse Contact	£78.00	Understanding the cost of end of life care in different settings (2012), Marie Curie Cancer Care PSSRU 2010, p. 159	
Hourly cost of Care at Home provided by a Home Care Worker	£24.00	PSSRU 2015, p.117	
Hourly cost of Informal Care (Spouse/Family etc.)	£7.20	https://www.gov.uk/national-minimum-wage-rates, accessed on 16th November, 2016	The national minimum wage per hour
Inpatient Day in Hospice Care	£425.00	Understanding the cost of end of life care in different settings, Marie Curie Cancer Care (2012)	

Week in Residential Home (Local Authority-Funded)	£518.67	Adapted from PSSRU 2015 and data provided by the Department of Health	
Week in Residential Home (Self-Funded)	£671.33	Adapted from PSSRU 2015 and data provided by the Department of Health	
Nursing Care Cost per Week: the nursing care aspect of the cost of a Nursing Home	£156.25	"Review of the Agency Cost Element of NHS Funded Nursing Care in England, 27 May 2016, Mazars LLP http://www.mazars.co.uk/Home/Our-Sectors/Public-Services/Health/NHS-Funded-Nursing-Care-Review"	Nursing home cost is assumed to be the combination nursing care cost and residential home cost
Week in Nursing Home (Local Authority- and NHS England-Funded)	£674.92	Adapted from PSSRU 2015 and data provided by the Department of Health	
Week in Nursing Home (NHS England- and Self-Funded)	£827.58	Adapted from PSSRU 2015 and data provided by the Department of Health	
Hourly cost of Community Palliative Nursing Contact (e.g. as provided by Marie Curie)	£77.00	Understanding the cost of end of life care in different settings, Marie Curie Cancer Care (2012)	
Specialist Community Palliative Care Contact Team (Community-Based Hospice Care)	Must be entered by the user	MUST be entered by the user as per visit	

Hourly cost of a Volunteer from a Third Sector Organisation	£7.20	https://www.gov.uk/national-minimum-wage-rates, accessed on 16th November, 2016	The national minimum wage per hour