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NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE (NICE)

Indoor Air Quality at Home Economic Model Report

Final Report

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31 May 2019

INVESTORS IN PEOPLE

Contents

Executive Summary

1. INTRODUCTION

NICE was asked by the Department of Health and Social Care (DHSC) to develop a public health guideline on exposure to indoor air pollution at home. The guideline will be aimed at local authority staff, private and social landlords, housing associations, people working in the voluntary housing sector and non-governmental organisations, health and social care professionals and facilities managers in housing and residential settings.

Indoor air pollutants come from building materials, furnishings, consumer products and activities such as cooking and smoking. They also come from biological sources, for example, mould, house dust mites, bacteria, pests or pet dander. Individuals spend approximately 90% of their time indoors and 60% of that time is spent at home. Children and people with respiratory conditions are susceptible to health problems caused by exposure to indoor air pollutants. Therefore, it is important to develop this guideline to reduce exposure to indoor air pollutants.

2. OBJECTIVES

The economic model outlined in this report will contribute towards the achievement of the objectives set out in the NICE scope. The key issues and questions included in the final scope were as follows:

1. Exposure to pollutants:
    - What risk factors increase the likelihood of a person being exposed to indoor air pollutants?
    - How is that risk stratified by different populations, different types of dwelling and different pollutants?
2. Signs and symptoms, and referral by health and social care professionals:
    - What signs and symptoms should prompt healthcare professionals to consider exposure to an indoor air pollutant in people presenting to health care services?
    - When is onward referral for environmental assessment appropriate?
3. Material and structural interventions:
    - What are the most effective material and structural interventions for preventing or reducing the health impacts of indoor air pollution?

4. Interventions to change people's knowledge, attitude and behaviour in relation to actions that can reduce their exposure to indoor air pollution:
    - What are the most effective strategies for raising awareness of the risks of indoor air pollution, particularly in those at most risk?
    - What are the most effective interventions to reduce exposure to indoor air pollution?
    - How can people balance the need for energy efficiency and ventilation to manage indoor air pollution exposure?

The cost-effectiveness model was developed with the aim to address questions three and four, in particular, with the remaining questions addressed within the effectiveness systematic reviews conducted by NICE.

3. METHODS

3.1 Model Structure

A de novo economic model was built within Microsoft Excel to estimate the incremental costs (health care and intervention) and health outcomes associated with before and after the implementation of an intervention designed to reduce exposure to indoor air pollution within dwellings.

The model flow was as follows (with all sources outlined in the relevant sections of the report):

- The baseline proportion of the population was estimated, stratified by the tenure of home ownership.
- The baseline prevalence of each symptomatic health condition was applied to the population.
- An increased risk of prevalence was applied to each condition, dependent upon physical building (e.g. damp homes), and non-building factors (e.g. fuel poverty), to estimate the overall baseline rate pre-intervention.
- The proportion of households with the condition specific baseline rates was then estimated.
- It was assumed that a proportion of dwellings with the overall risk profile will implement the intervention.
- An expected relative reduction in symptoms of each health condition was applied to estimate the number of people within the population, pre-intervention, that have each condition.
- The costs and utility decrements associated with each condition were then applied to the number of inhabitants with the condition pre and post-intervention.
- Furthermore, the upfront and annual cost of the intervention was applied to the dwellings in which it was implemented.

The model also estimated both the cost and health-related quality of life impact that a home based intervention might have if the number of children with asthma was reduced. The annual cost and disutility associated with asthma was attributed to the prevalence of paediatric asthma pre and post-intervention to estimate the lifetime costs and health-related quality life of children with asthma. This is presented within the results as a standalone outcome measure.

3.2 Model Inputs

Due to a lack of quantitative evidence no specific interventions were included in the model. Instead, a range of unit cost values were included in the model to cover probable scenarios. For example, the cost of an intervention was varied between £0 and £250 per dwelling. The model estimated the reduction in number of symptomatic cases of each health condition following the implementation of an intervention, which was translated into a reduction in health care costs over a five-year time horizon.

Data on current home occupancy within England were sourced from the English Housing Survey (2016) and dwellings were classified by the following types of tenure:

- Owner occupied
- Private rented
- Local authority
- Housing association

A small number of dwellings were considered to have a high physical risk profile which could increase the likelihood of exposure to indoor air pollution. One of the following mutually exclusive dwelling-related physical risk factors could be selected in the model to be applied in the analysis. Each of these were identified from the English Housing Survey:

- Non-decent homes
- Usable floor area <90m^2
- Any damp problem

Data were sourced on the number of dwellings with each physical risk factor, stratified by tenure, to estimate the number of inhabitants at increased risk of exposure to indoor air pollution. The baseline rate of symptomatic health conditions, obtained from literature, could also be increased by a multiplier based on the presence of an excess risk profile designed to encompass many other factors that may increase the risk of an inhabitant being exposed to indoor air pollution e.g. poverty or frailty. The effect of the aforementioned risk factors on the rate of symptomatic health conditions was based on assumptions.

The following health conditions were included in the model because the PHAC committee considered them to be the most relevant to indoor air pollution:

- Asthma
- Chronic obstructive pulmonary disease (COPD)
- Allergic rhinitis
- Generalised anxiety disorder (GAD)

The baseline rate of each health condition and the associated costs, resource use and disutilities were extracted from published sources.

4. RESULTS

Due to the scarcity of data with which to populate the model, and the uncertainties in the current inputs, the results presented are predominantly sensitivity analyses. The model could be used as an interactive 'calculator' aimed to inform guidance on implementing home based interventions, for example, the installation of extractor fans or insulation, to reduce exposure to indoor air pollution.

During an extra committee meeting in January 2019, the committee were mindful to recommend an intensive intervention involving in-home environmental assessments, education, support for behaviour change, and the provision of resources to reduce exposure to triggers of asthma. However, they were concerned that it may not be cost-effective. A US study by Krieger *et al*., (2005) [1] assessed similar interventions and was, therefore, considered useful for illustrative purposes and as an attempt to answer the committee's concerns. Sections 3.1.2 to Sections 3.1.5 outline the methods used to run this intervention through the model and the subsequent cost-effectiveness results.

Results are also presented as a two-way sensitivity analysis varying the upfront intervention cost and the effectiveness of the intervention in reducing health condition associated symptoms simultaneously to determine the impact on incremental total cost. This analysis demonstrates that as the risk profile of a dwelling increases the greater the capacity to benefit. This type of threshold analysis can help a stakeholder make the decision as to whether to implement an intervention to reduce exposure to indoor air pollution.

5. DISCUSSION

The results show that, with the inputs outlined in Section 3.2, the key drivers of cost savings to the NHS were the excess risk profile of dwellings and upfront costs and effectiveness of the intervention. However, the inputs for the impact of living in a dwelling with an excess risk profile are based upon assumptions. Therefore, this is an important data gap in the model. The method of presenting model results using a 'what-if?' sensitivity analysis was deemed to be the most appropriate based on the data that were available. This approach has some limitations which include no definitive answer being given as to whether a specific intervention is cost saving. However, it does allow the analysis to be directly relevant to a larger group of stakeholders because it does not address one specific decision problem. The model is designed as a flexible interactive 'cost calculator' so that it can be tailored to different types of dwellings and to a specific intervention.

Acknowledgements

The authors would like to thank members of the PHAC for their valuable contributions in developing the economic model.

Abbreviations

COPD	Chronic obstructive pulmonary disease
DHSC	Department of Health and Social Care
GAD	Generalised anxiety disorder
GP	General practitioner
HRQoL	Health-related quality of life
ICER	Incremental cost-effectiveness ratio
ICU	Intensive care unit
NHS	National Health Service
NICE	National Institute for Health and Care Excellence
PHAC	Public Health Advisory Committee
PSSRU	Personal Social Services Research Unit
QALY	Quality-adjusted life year
VOC	Volatile organic compound
YHEC	York Health Economics Consortium

Section 1: Introduction

Indoor air pollutants come from building materials, furnishings, consumer products and activities such as cooking and smoking. They also come from biological sources, for example, mould, house dust mites, bacteria, pests or pet dander. Individuals spend approximately 90% of their time indoors and 60% of that time is spent at home [2]. Children and people with respiratory conditions are most susceptible to health problems caused by exposure to indoor air pollutants [2].

As outlined in the final scope published on the National Institute for Health and Care Excellence (NICE) website [2], NICE was asked by the Department of Health and Social Care (DHSC) to develop a public health guideline on exposure to indoor air pollution at home. The guideline was aimed at local authority staff, private and social landlords, housing associations, people working in the voluntary housing sector and non-governmental organisations, health and social care professionals and facilities managers in housing and residential settings.

The economic model outlined in this report will contribute towards the achievement of the objectives set out in the NICE scope [2]. The key issues and questions included in the final scope were as follows:

1. Exposure to pollutants:
    - What risk factors increase the likelihood of a person being exposed to indoor air pollutants?
    - How is that risk stratified by different populations, different types of dwelling and different pollutants?
2. Signs and symptoms, and referral by health and social care professionals:
    - What signs and symptoms should prompt healthcare professionals to consider exposure to an indoor air pollutant in people presenting to health care services?
    - When is onward referral for environmental assessment appropriate?
3. Material and structural interventions:
    - What are the most effective material and structural interventions for preventing or reducing the health impacts of indoor air pollution?
4. Interventions to change people's knowledge, attitude and behaviour in relation to actions that can reduce their exposure to indoor air pollution:
    - What are the most effective strategies for raising awareness of the risks of indoor air pollution, particularly in those at most risk?
    - What are the most effective interventions to reduce exposure to indoor air pollution?
    - How can people balance the need for energy efficiency and ventilation to manage indoor air pollution exposure?

The cost-effectiveness model was developed with the aim to address questions three and four, in particular, with the remaining questions addressed within the effectiveness systematic reviews conducted by NICE. The evidence identified during the cost-effectiveness review was very limited, hence, the benefit of a *de novo* economic model. The expected outcomes from the NICE scope comprised the following:

- Health-related outcomes from exposure to indoor air pollutants
- Levels and concentrations of indoor air pollutants within dwellings
- Individual changes in behaviour to reduce indoor air pollutants within dwellings
- Levels and concentrations of environmental tobacco smoke and levels of vapour that come from e-cigarettes
- Economic outcomes
- Health-related quality of life

Due to a lack of available data it was not possible to explicitly include all of the outcomes outlined within the NICE scope in the economic modelling. The model focused upon health conditions associated with exposure to indoor air pollution, estimating both health-related quality of life and economic outcomes for each condition. The model also estimated clinical outcomes associated with interventions to reduce exposure to indoor air pollution, such as a reduction in health care professional contact, hospital admissions and condition exacerbations.

The NICE scope outlined the expected outcomes of the economic modelling to include 'cost per quality-adjusted life year (QALY)' (p.10, NICE Final Scope [2]). Using costs and QALYs to calculate incremental cost-effectiveness ratios (ICER) is the approach usually taken in economic evaluations for NICE, if the data allow for this type of analysis. This approach allows decision makers to determine whether an intervention is an efficient allocation of National Health Service (NHS) resources. NICE has never identified an ICER above which interventions should not be recommended and below which they should. However, in general, interventions with an ICER of less than £20,000 per QALY gained are typically considered to be cost-effective [3].

However, this approach was not considered appropriate for the current economic analysis. Using QALYs as a primary outcome would not be relevant to private/social landlords, housing associations, both governmental and non-governmental organisations and those working in the voluntary housing sector. From the point of view of these people, although the health-related quality of life (HRQoL) of their inhabitants may be important, HRQoL alone does not have a monetary value in any sense that could be used, and nor does it capture other types of benefits. Increasing inhabitants' HRQoL will be captured through cost savings to the NHS. However, the impact to the home owner will be captured through the cost spend on the intervention alone, without consideration of QALYs. A QALY-based ICER would not have any meaning in terms of representing opportunity costs because the opportunity cost in that sector would include spending on areas outside healthcare.

The opportunity cost of an intervention is what is foregone as a consequence of adopting a new intervention. In a fixed budget health care system, where increased costs will displace other health care services already provided, the opportunity cost is measured as the health lost as a result of the displacement of activities to fund the selected intervention.

Therefore, whilst QALYs were reported, rather than calculating an ICER, the primary outcomes from the model showed whether or not an intervention is cost-increasing or cost-saving.

The following document outlines the modelling approach used to estimate the cost-effectiveness of interventions designed to reduce exposure to indoor air pollution within dwellings, and the corresponding results. A *de novo* model was developed and sensitivity analysis reported to provide decision-makers with information on how cost-effective an intervention will be, given its levels of cost and efficacy in reducing exposure to indoor air pollution.

The document is structured as follows: Section 2 outlines the methods used when developing the model including the model inputs, Section 3 provides a summary of the model results and Section 4 includes a discussion of the model outputs.

Section 2: Methods

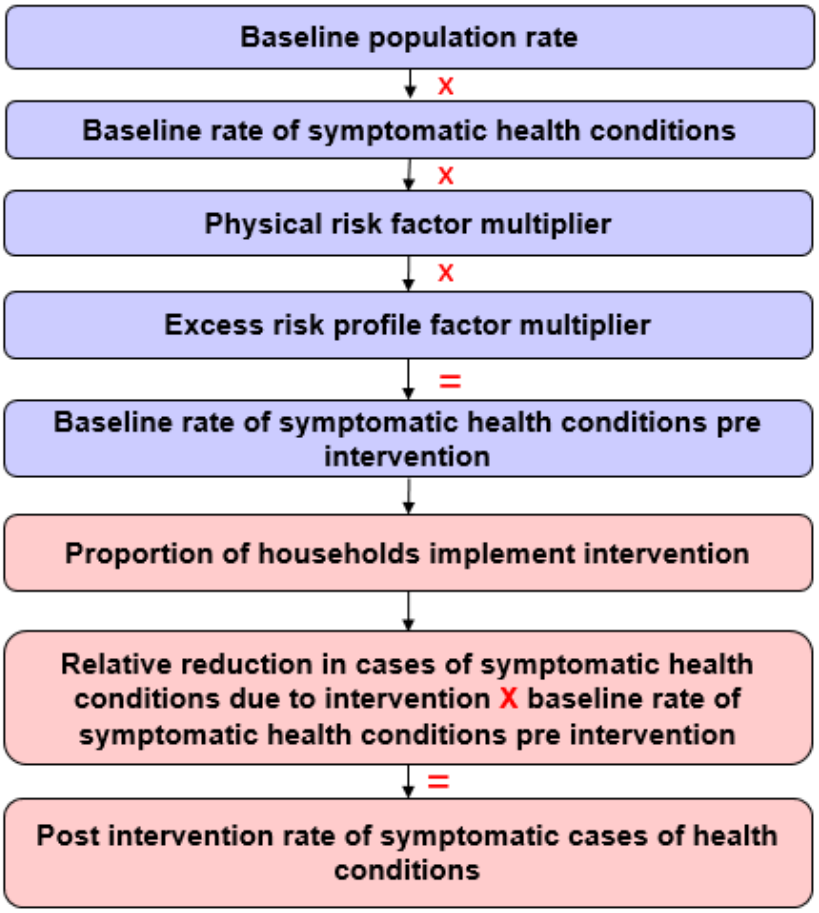
2.1 MODEL STRUCTURE

A *de novo* economic model was built within Microsoft Excel to estimate the incremental costs and health outcomes pre- and post- implementation of an intervention designed to reduce exposure to indoor air pollution. The basic structure of the model used to estimate outcomes associated with a reduction in exposure to indoor air pollution is outlined in Figure 2.1. The model flow describes how the number of people with pre-specified health conditions were estimated pre- and post-intervention implementation over a five-year time period.

The model flow is as follows (with all sources outlined in the relevant sections of the report):

- The baseline proportion of the population was estimated, stratified by the tenure of home ownership, as reported by the English Housing Survey (2016) [4].
- The baseline prevalence of each symptomatic health condition was applied to the population regardless of home ownership modality.
- An increased risk of prevalence was applied to each condition, dependent upon physical building, (for example, damp homes), and non-building factors (for example the elderly or people with comorbidities) to estimate the overall baseline rate pre-intervention.
- The proportion of households with the condition specific baseline rates was then estimated.
- It was assumed that a proportion of dwellings with the overall risk profile (a combination of baseline risk, building characteristics and non-building characteristics) will implement the intervention.
- An expected relative reduction in symptoms of each health condition was applied to estimate the number of people within the population, pre-intervention, that have each condition.
- The costs and utility decrements associated with each condition were then applied to the number of inhabitants with the condition pre and post-intervention.
- Furthermore, the upfront and annual cost of the intervention were applied to the dwellings in which it was implemented.

Figure 2.1: Model structure



A five-year discount rate of 0.93462 (see Table 2.1 for derivation of this value) was applied to the future healthcare cost savings associated with each health condition. This discount rate was based on a rate of 3.5% per year in alignment with the NICE guides to the methods of technology appraisal [3]. A discount rate was not applied to intervention costs because it was assumed that all costs would be upfront.

Table 2.1: Derivation of five-year discount rate

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
No discounting	1.00000	1.00000	1.00000	1.00000	1.00000	**5.00000**
Discounting	1.00000	0.96618	0.93351	0.90194	0.87144	**4.67308**
Ratio						**0.93462**

The National Health Service (NHS) would experience cost savings due to fewer cases of symptomatic health conditions following an anticipated reduction in exposure to indoor air quality. However, the funder of the intervention was expected to be dependent upon the tenure of each dwelling. Therefore, the costs of interventions were stratified by dwelling tenure whilst health condition related costs were presented from the perspective of the NHS and personal social services.

Due to the lack of data and uncertainties in the model inputs, producing one single result would be of limited usefulness. Furthermore, it would not be applicable to all possible variations in the model, such as type of home tenure and type of intervention. Therefore, the results were reported in a series of two-way sensitivity analyses. Two-way sensitivity analysis allows for two parameters to be varied at one time in order to observe the effect that this has on the model results. Details of the presentation of results are discussed in Section 2.3.

2.1.1 Paediatric Asthma

The Public Health Advisory Committee (PHAC) discussed the importance of capturing both the cost and health-related quality of life (HRQoL) impact that a home based intervention may have if the number of children with asthma was reduced, because they anticipated interventions may lead to substantial cost savings and HRQoL gains. The annual cost and disutility (a loss of utility) associated with asthma was attributed to the prevalence of paediatric asthma pre and post-intervention to estimate the lifetime costs and health-related quality life of children with asthma. General all-cause mortality was included in the model to capture the number of deaths, based on life tables for the United Kingdom [5]. For simplicity, no additional mortality risk associated with paediatric asthma was included. Age and gender stratified rates were used and it was assumed that children entered the model at birth, with 44.2% of these assumed to be females [6]. Both the annual costs and disutility associated with asthma were discounted at a rate of 3.5% per year in alignment with the NICE process and methods manual for guideline development [3]. To prevent double-counting the lifetime costs and disutility associated with paediatric asthma, pre- and post-intervention, were reported as a standalone outcome measure.

2.2 MODEL INPUTS

As previously mentioned, there was a lack of quantitative evidence around the implementation of home based interventions that were targeted specifically at reducing exposure to indoor air pollution. There were many factors that could affect the costs and effectiveness of a home based intervention. These included the age of inhabitants, co-morbidities, the quality of the home pre-intervention, the type of intervention and personal financial situations. As defined in the NICE scope, there were a wide range of interventions including:

- Removing indoor sources of pollution, (for example, hazardous building materials).
- Using construction materials and consumer products with low volatile organic compound (VOC) emissions.
- Installing extractor fans.
- Reducing high humidity levels (using dehumidifiers) to prevent mould and house dust mites.
- Interventions to change people's knowledge, attitude and behaviour in relation to a range of actions to reduce their exposure to indoor air pollution.

In addition, the systematic and targeted literature reviews did not identify any intervention studies that had the quantitative data necessary to populate the model. As such, rather than determining a single base case input for use in the economic model, a range of plausible values were estimated. Wide input ranges were used in the model to try and cover the most probable scenarios. The information used to determine these ranges is outlined in the following sections. The inputs included in this iteration of the model and report can be refined at a later stage if better data sources are identified. However, the best available inputs that were identified to-date were included and this can be used as a starting point for discussion.

The model estimated the effects of an intervention over a five-year time period. If the effects of the intervention lasted less than five years, then it is likely this model overestimated the benefits. If the effects of the intervention lasted longer than five years this model may not have captured all of the benefits and any ongoing costs associated with the intervention.

This section outlines the data that were used to populate the economic model and also highlights any areas in which there were thought to be gaps in the evidence.

2.2.1 Home Occupancy

Dwellings in England were classified by the following types of tenure:

- Owner occupied
- Private rented
- Local authority
- Housing association

The English Housing Survey (2016) [4] was used to determine the total number of dwellings in England that fall into each type of tenure (Table 2.2). This was judged an appropriate measure because it is a national survey that collects information about people's housing circumstances and the condition of housing in England. The average number of inhabitants per dwelling in the United Kingdom (2.3) [7] was then multiplied by the number of dwellings in each tenure category to estimate the total number of inhabitants within the baseline population. Data on tenure from the United Kingdom were used as a proxy for English data because it was not reported for England only. For simplicity, we have assumed that the average number of inhabitants per dwelling was independent of dwelling type.

The economic model generated results for the UK as a whole, and as such the English housing survey data represented the best estimates of the distribution across each housing type. The average number of inhabitants and distribution of home occupancy by tenure was independent of building type. Therefore, these inputs were subject to a high degree of uncertainty. Due to the high level of assumptions used in the model, as outlined throughout the report, we have not presented any analyses of the impact of this uncertainty on the outcomes from the model. Although these inputs were associated with such uncertainty these were not expected to be the key determinants of the cost or efficacy of an intervention and, therefore, sensitivity analysis around them was not included within the model.

Table 2.2: Home occupancy by tenure (2017) (a combination of English and UK data)

Tenure	Percentage	Number of houses	Total number of inhabitants
Owner occupied	62.4%	14,809,164	34,061,078
Private rented	20.5%	4,865,190	11,189,937
Local authority	6.8%	1,613,819	3,711,784
Housing association	10.3%	2,444,461	5,622,261
Total	100%	23,732,635	54,585,061

2.2.2 Physical Risk Factors

Following discussion with the committee, it was assumed that the physical risk profile of certain dwellings could increase the likelihood of exposure to indoor air pollution. It was possible for one of the following dwelling-related physical risk factors to be selected and applied in the analysis, each of which were identified from the English Housing Survey [4]:

- Non-decent homes (for a home to be considered 'decent' it must: meet the current minimum standard for housing set out in law, be in a reasonable state of repair, have reasonably modern facilities and services and have effective insulation and heating).
- Usable floor area <90m^2 (this is based on the recorded dwelling floor area and includes the categories: 90 to 109 square metres and 110 or more square metres).
- Any damp problem (a home with a damp problem is one with any of the following: rising damp, penetrating damp or serious condensation or mould in any room of the dwelling).

Data were sourced from the English Housing Survey [4] on the number of dwellings with each physical risk factor, stratified by tenure, to estimate the number of inhabitants at increased risk of exposure to indoor air pollution. A physical risk factor multiplier (an assumption to be determined on a case by case basis) was then applied to the baseline rate of each symptomatic health condition and applied to inhabitants living in dwellings with the physical risk factor. Because there was a lack of evidence regarding the effect of the aforementioned risk factors on the rate of the included health conditions a range of values were reported as a threshold analysis within the results to capture multiple scenarios.

For the purpose of the economic analysis, it was assumed that the physical risk factors associated with dwellings were mutually exclusive due to a lack of data availability regarding the likelihood of a dwelling having more than one physical risk factor.

Table 2.3: Proportion of homes with each physical risk factor

Tenure	Non-decent homes	Usable floor area <90m2	"Any damp problem"
Owner occupied	19.7%	46.7%	2.7%
Private rented	26.8%	75.8%	8.2%
Local authority	12.6%	91.2%	6.0%
Housing association	12.6%	88.5%	3.9%

2.2.3 Excess Risk Factor

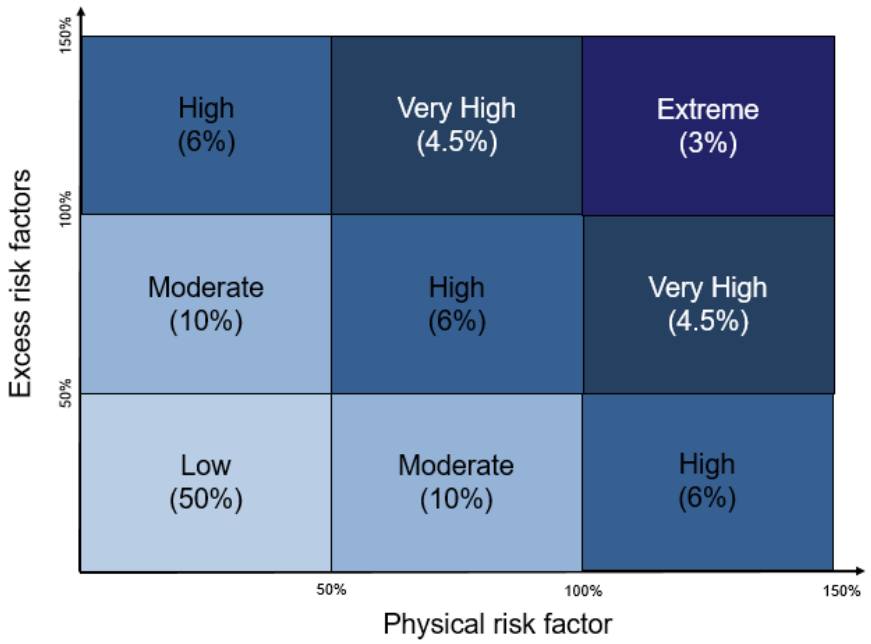
The baseline rate of symptomatic health conditions could also be increased by a multiplier based on the presence of an excess risk profile which was also an assumption-based input which could be determined on a case by case basis. This additional excess risk profile was applied multiplicatively to the physical risk profile and was designed to encompass many other factors that may increase the risk of an inhabitant being exposure to indoor air pollution. For example, a 50% increase in both risk factors would result in a 125% increase overall (1.5 x 1.5 = 2.25). Factors that may be incorporated into this risk profile could include, but was not limited to, the following:

- Crowded homes
- Comorbidities
- Elderly people
- Socioeconomic factors
- Frailty
- Poverty

2.2.4 Risk Profile of Homes in England

The physical and excess risk factors were combined to allocate a risk profile to each dwelling within England. It was assumed that the majority of dwellings would have a minimal excess risk profile whilst a very low number of dwellings would have a very high excess risk profile. The risk profile of a dwelling could be used by decision makers to determine the type of intervention that would be most applicable. For example, for dwellings with a very high physical risk factor but low excess risk factor an intervention that would improve the structural properties of the home would be more appropriate. The assumed distribution of and increased risk associated with both excess risk and a physical risk factors within dwellings is presented in Figure 2.2 (with the mid-point of each box used in the analysis). It was assumed that dwellings without a physical risk factor would not have any excess risk, nor implement the intervention. However, these assumptions could be manually changed in the model.

Figure 2.2: Distribution of dwellings with physical risk factor by risk multiplier



2.2.5 Intervention Cost

The specific cost of an intervention was difficult to determine owing to the huge range of interventions that were available. As discussed by the PHAC and identified in the literature reviews, interventions for indoor air quality could range from ventilation systems to encouraging adults to spend less time in the house [2]. Furthermore, both the upfront and maintenance costs associated with interventions could vary substantially from the installation of a ventilation system to the delivery of environmental modules by an environmental counsellor.

The definition of 'intervention cost' was flexible in order to allow all scenarios to be assessed. It could include only the upfront price of the intervention or it could also incorporate the upfront price of the intervention plus the annual maintenance cost of the intervention. The upfront cost of the intervention was varied in threshold analyses presented in Section 3.2, with the arbitrary range varied between £0 and £250 per dwelling. Although there was variation between the costs of potential interventions, results were presented using this range of costs in order to present the committee with the threshold at which the intervention will no longer be cost-saving.

For certain interventions, such as the installation of ventilation system, implementation and use would be mandatory. For other interventions, such as opening a window regularly, this assumption could not be made. To overcome this, an implementation input was included in the model which was stratified by housing tenure and physical risk factor characteristics. The cost of the intervention was only applied to the dwellings that were assumed to have implemented the intervention and, as aforementioned, the source of the funding was dependent upon the tenure of the dwelling. The proportion of dwellings implementing the intervention was varied within the results.

The effectiveness of the intervention was assumed to be constant over the five-year time horizon over which it was estimated.

2.2.6 Health Condition Baseline Prevalence (pre-intervention)

The health conditions considered by the PHAC to be most relevant to exposure to indoor air pollution were:

- Asthma
- Chronic obstructive pulmonary disease (COPD)
- Allergic rhinitis
- Generalised anxiety disorder (GAD)

Asthma, COPD and allergic rhinitis were included in the model because they were directly relevant to exposure to indoor air pollution. However, the PHAC expressed an interest in the effects that exposure to indoor air pollution could have on the mental health of inhabitants both directly and indirectly. Firstly, evidence has shown a direct link between poor housing conditions and poor mental health. Secondly, the PHAC believed that housing conditions leading to indoor air pollution could indirectly affect mental health. Poor housing conditions (for example, with damp and mould) may further contribute to poorer mental health because embarrassment can lead to a lack of social interactions within dwellings. Furthermore, tenants are likely to suffer poor mental health due to a lack over control over their own home environment, especially if they are unable to improve the indoor air quality without permission from their landlord. The PHAC considered GAD to be an appropriate proxy to incorporate a range of aspects regarding mental health.

The baseline prevalence of each health condition in England, before the implementation of an intervention and prior to the consideration of both the physical and excess risk factors, was sourced from published literature. It was assumed that the baseline prevalence represented symptomatic cases of each health condition. The values included in the model and their sources are presented in Table 2.4.

The impact of uncertainty in the base case prevalence values was not explored in the economic evaluation but could be altered if an alternative data source was preferred.

Because these values were sourced from the literature it was not necessary for ranges to be applied.

Table 2.4: Baseline prevalence

Condition	Prevalence	Source
Asthma	8.9%	Asthma UK: Asthma facts and statistics [8]
Asthma (paediatrics)	9.7%	Asthma UK: Asthma data visualisations [6]
COPD	2.0%	British Lung Foundation: Chronic obstructive pulmonary disease (COPD) statistics [9]
Allergic rhinitis	10%	Allergy UK: Statistics [10]
Generalised anxiety disorder	4.4%	National Clinical Guideline Number 113: Generalised Anxiety Disorder in Adults [11]

2.2.7 Intervention Efficacy

The efficacy of the intervention in the model was determined by a relative reduction in the number of symptomatic cases of each health condition in dwellings in which the intervention was implemented. As aforementioned, due to a scarcity of data and a wide range of interventions, a specific input for the efficacy of a particular intervention in any specific patient group would have been difficult to determine. If a relevant intervention was identified from the literature reviews, and sufficient efficacy data were available for a particular health condition, this could be inputted into the model.

The efficacy input was, therefore, flexible and separate values could be inputted for each health condition. Furthermore, the efficacy of the intervention could also be different for dwellings with and without a physical risk factor. For the threshold analysis, the relative reduction in symptomatic cases of each health condition was varied between 0% and 10% over five years (with a constant effectiveness value applied over the five-year period). It was assumed that all dwellings with an excess risk factor implemented the intervention and those without the overall excess risk factor did not. It was also assumed that the effectiveness of the intervention remained constant over the five-year time horizon of the model.

2.2.8 Health Condition Costs

An annual unit cost was estimated for each health condition (Table 2.5). The health care condition costs pre-intervention were subtracted from the health care condition costs post-intervention in the first year. This result was multiplied by five to estimate the cost impact of the intervention over a five-year time horizon. The sources of these values are detailed below.

As with the epidemiological parameters, we did not explore the impact of uncertainty in these values in the economic evaluation, but the values in question could be overridden if an alternative data source was preferred.

Table 2.5: Health condition unit costs

Health outcome	Annual cost
Asthma	£672
COPD	£1,382
Allergic rhinitis	£373
Generalised anxiety disorder	£911

Asthma

The weekly cost of asthma was sourced from a NICE technology appraisal for eosinophilic asthma (TA479) [12]. No data were identified on the number of weeks in a year an individual with asthma will spend in each health state so this was based on assumptions. The duration of a severe or moderate exacerbation was sourced from the NICE appraisal (TA479) [12]. The average number of exacerbations an individual with asthma will have in a year was sourced from the literature (0.11) [13]. However, the source did not include the proportion of these exacerbations that were moderate or severe. It was assumed that the majority of exacerbations would be moderate (0.1) and only a small proportion would be severe (0.01). The resources associated with a moderate or severe exacerbation are outlined in Section 2.2.9. It was assumed that for the remainder of weeks, in which an individual was not experiencing a severe or moderate exacerbation, they were either in the controlled or uncontrolled asthma health state. The number of weeks in a year spent in each health state was multiplied by the weekly unit cost to generate an annual unit cost per person with asthma of £672.

Table 2.6: Asthma weekly costs

Health state	Unit costs (weekly)	Number of exacerbations	Duration of exacerbation (weeks)	Number of weeks (in a year) in each health state
Controlled asthma	£12.23	N/A	N/A	51.38
Uncontrolled asthma	£46.61	N/A	N/A	0.50
Moderate exacerbation	£72.57	0.10	1	0.10
Severe exacerbation	£669.95	0.01	2	0.02

COPD

The proportion of people with COPD at each level of disease severity was sourced from a study on a large database of primary care COPD patients in the United Kingdom [14]. The monthly cost associated with being in each stage of severity was extracted from a cost-utility study of COPD in the UK [15]. Because the study did not include a cost for people with mild COPD it was assumed that the cost would be equal to the monthly cost for people with moderate COPD. Similarly, the non-severe and severe exacerbation rates were identified for people with moderate to very severe COPD and the exacerbation rates for people with mild COPD were assumed to be equal to those with moderate COPD. The costs for severe (£4,071) and non-severe (£128.92) exacerbations were sourced from the cost-utility study [15]. The monthly costs of exacerbations and managing COPD were multiplied by 12 to generate annual costs. Furthermore, a weighted average of these costs based on the proportion of people with COPD at each level of disease severity was calculated to generate an annual unit cost per person with COPD of £1,382.

Table 2.7: COPD severity proportions

Disease severity	Prevalence	Monthly cost
Mild	17.1%	£43.15
Moderate	52.2%	£43.15
Severe	25.5%	£90.55
Very severe	5.2%	£149.53

Table 2.8: COPD exacerbation rates

Disease severity	Non-severe exacerbation rate (monthly)	Severe exacerbation rate (monthly)
Mild	0.05	0.01
Moderate	0.05	0.01
Severe	0.06	0.02
Very severe	0.07	0.03

Allergic Rhinitis

An annual cost for people with allergic rhinitis was sourced from a cost-effectiveness study evaluating immunotherapy in the UK [16]. This was inflated from 2005 to 2017 using the PSSRU index to generate a unit cost of £372.76.

Generalised Anxiety Disorder

An annual cost for people with GAD was identified from a NICE guideline on the management of GAD in primary, secondary and community care [11] (£910.73).

2.2.9 Resource Use

As described in detail below, resource use was sourced for each health condition included in the model in order to generate an estimate of the potential resource savings as a result of an intervention. However, these resource use values were not linked to the calculation of health condition costs.

Asthma

The resource use data for asthma (Table 2.9) were sourced from the NICE technology appraisal for eosinophilic asthma (TA479) [12]. The NICE guideline contained weekly resource use for each included asthma health state. This was multiplied by the number of weeks that an individual was estimated to be in the health state each year (Table 2.6).

Table 2.9: Annual resource use for asthma (per patient)

		Controlled asthma	Uncontrolled asthma	Moderate exacerbation	Severe exacerbation	Weighted average
Outpatient	Visit to GP	1.7983	0.0700	0.0600	0.0126	1.9409
	Visit to Nurse	3.0314	0.0800	0.0430	0.0103	3.1647
	Visit to specialist	1.2485	0.0470	0.0094	0.0058	1.3107
Home visit	Visit from GP	0.2605	0.0125	0.0003	0.0038	0.2772
	Visit from nurse	0	0	0	0.0001	0.0001
Hospitalisation	Severe exacerbation related hospitalisation	0	0	0	0.0005	0.0005
	A&E visit	0	0	0	0.0004	0.0004
	A&E visit + hospitalisation	0	0	0	0.0005	0.0005
	Ambulance + hospitalisation	0	0	0	0.00003	0.00003
	Ambulance + A+E + Hospitalisation	0	0	0	0.0001	0.0001
	Hospitalisation including ICU stay	0	0	0	0.0002	0.0002

COPD

The annual resource data for people with COPD (Table 2.10) were sourced from a cost-utility study of COPD in the UK [15]. A weighted average of these values was calculated based on the proportion of people with COPD at each level of disease severity (Table 2.7).

Table 2.10: Annual resource use for COPD

		Mild	Moderate	Severe	Very severe	Weighted average
Primary health care professional visit	GP practice visits	0.87	0.87	1.72	1.72	**1.13**
	Primary Care Nurse visit	0.90	0.90	1.70	1.70	**1.14**
	GP home visit	0.09	0.09	0.48	0.48	**0.21**
Secondary health care professional visit	Hospital Outpatients visit	0.20	0.20	0.64	0.64	**0.33**
	Hospital Outreach Nurse-led visit	0.01	0.01	0.16	0.16	**0.06**

Allergic Rhinitis

The annual resource use data for allergic rhinitis were sourced from a cost-effectiveness study evaluating immunotherapy in the UK [16].

Table 2.11: Annual resource use for allergic rhinitis

Resource	Events per person during pollen season*
Physician visit	2.4
Extra GP/specialist visit	0.127
Acute ward visit	0.016

* Assuming one pollen season per year.

Generalised Anxiety Disorder

The resource use data for GAD were sourced from a NICE guideline on the management of GAD in primary, secondary and community care [11].

Table 2.12: Annual resource use for GAD

Primary health care professional visits	% of people with GAD receiving care annually	Time spent on each service annually	Time spent on each service annually per person
Inpatient care (days)	4%	22.4	0.90
Outpatient visit	32%	2.00	0.64
Psychiatrist (visit)	6%	2.00	0.12
Psychologist (visit)	4%	8.00	0.32
Mental health nurse (visit)	5%	6.00	0.30
Social worker (visit)	5%	6.00	0.30
GP visit	52%	1.00	0.52
Community day care centre (session)	9%	100	9.00

2.2.10 Disutilities

An annual disutility for each health condition was determined by calculating the difference between the annual utility associated with each health condition and the relevant baseline utility (Table 2.13). Baseline utilities for allergic rhinitis and GAD were determined using Kind *et al*. UK population norms for EQ-5D [17]. These were based on the average age, and weighted based on gender, of the participants included in the relevant utility elicitation studies (Table 2.13). The sources for all utility values are described in detail below. On the basis of the approach used in a recently published standardisation assessment of models in COPD and asthma, a baseline utility of one was chosen for the purpose of deriving all health state decrements [18, 19].

Table 2.13: Health condition disutilities

Health outcome	Annual utility value	Baseline (Age / % female)	Annual disutility
Asthma	0.92	1.00	0.08
COPD	0.78	1.00	0.22
Allergic rhinitis	0.84	0.87 (46.20/51%)	0.03
Generalised anxiety disorder	0.68	0.86 (47.60/72%)	0.18

Asthma

The utility value for each asthma-related health state was sourced from a NICE technology appraisal for eosinophilic asthma (TA479, Table 2.14) [12]. A weighted average value of 0.92 was calculated based on the number of weeks an individual with asthma would spend in each health state in a year (assumption).

Table 2.14: Asthma utility values

Disease status	Utility value	Number of weeks (in a year) in each health state
Controlled asthma	0.92	51.38
Uncontrolled asthma	0.73	0.5
Moderate exacerbation	0.57	0.1
Severe exacerbation	0.33	0.02

Chronic Obstructive Pulmonary Disease (COPD)

The utility values for moderate to very severe COPD were sourced from a study on a large database of primary care COPD patients in the United Kingdom (Table 2.15) [15]. The utility value for mild COPD was sourced from a systematic review and meta-analysis [20]. A weighted average value of 0.78 was calculated based on the proportion of people with COPD at each level of disease severity (Table 2.7).

Table 2.15: COPD utility values

Disease severity	Utility value	Source
Mild	0.82	[20]
Moderate	0.79	[15]
Severe	0.75	
Very severe	0.65	

Allergic Rhinitis

The utility value for allergic rhinitis was sourced from a utility elicitation study in adults and children [21].

Generalised Anxiety Disorder (GAD)

The utility value for GAD was sourced from a cost-effectiveness analysis of mobile and traditional cognitive behavioural therapy for GAD [22]. The utility value for moderate anxiety was used as a proxy for GAD. It must be noted that this study was based upon a small pilot program of 89 individuals from one large national employer. Furthermore this study was based in the United States. Therefore, the generalisability of the results to the UK population is limited.

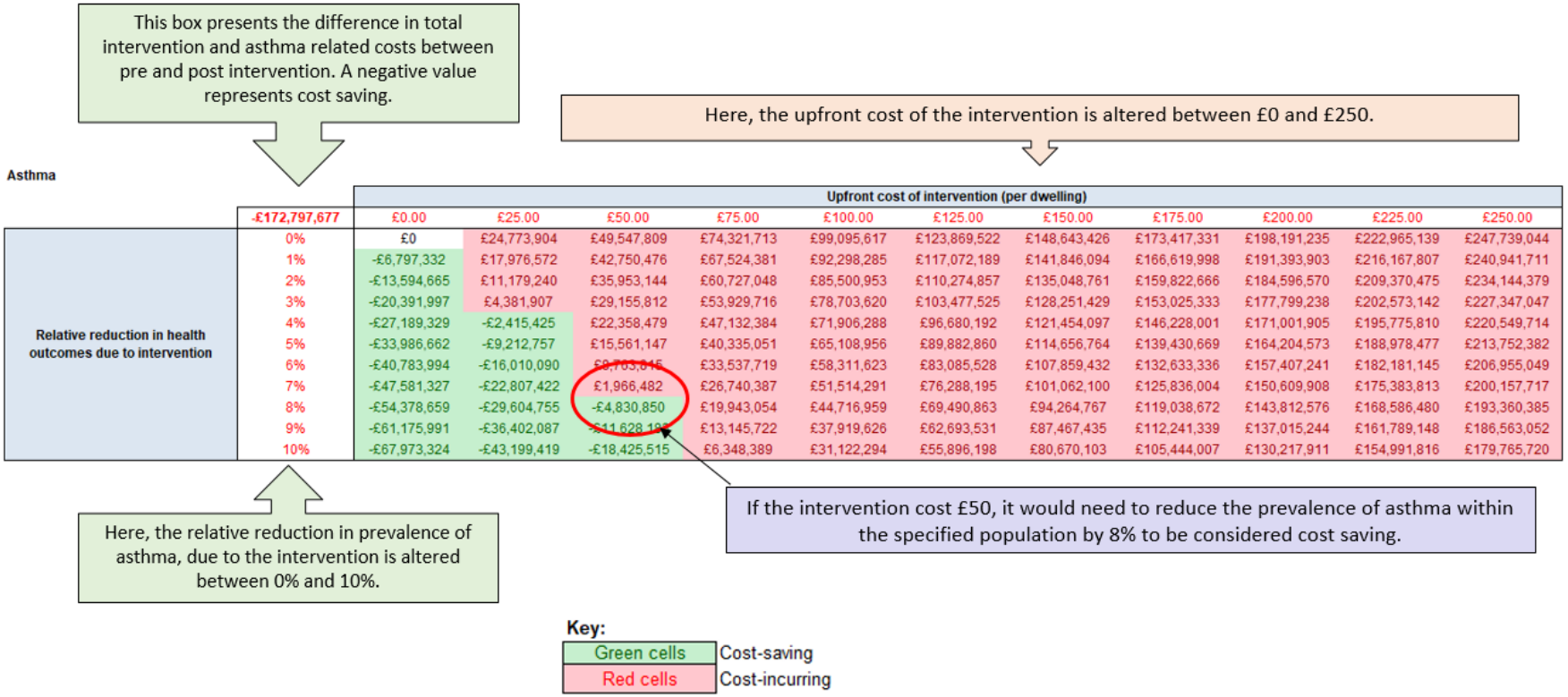
2.3 PRESENTATION OF RESULTS

Due to the scarcity of data with which to populate the model and the uncertainties in the current inputs, the results have been presented mainly as a sensitivity analysis. When the data populating a model is poor or scarce, it is often more useful for the model user to have a range of inputs displayed, rather than a single set of results which are calculated from the base case inputs. The results presented within the following section begin with an illustrative example, and then cover many different permutations of scenarios and settings, such as an intervention that is likely to lead to a 10% reduction in symptomatic cases of asthma in dwellings with a low excess risk function, or an intervention that is likely to lead to a 50% reduction in cases of symptomatic COPD in dwellings with a high excess risk function.

The model was built in Microsoft Excel. It takes the form of an interactive 'calculator' which provides access to a full range of input sheets. This allows various scenarios to be run by choosing from the options provided in the set-up, inputs and results sheet. Assigning specific values to inputs enables results specific to particular dwelling characterises to be generated on a case by case basis.

Two way sensitivity analysis is a technique used in economic evaluation to assess the robustness of the overall result when simultaneously varying the values of two key input variables. In this model, the upfront cost of the intervention was varied simultaneously with the potential relative reduction in symptomatic cases of each health condition. Presenting the results as a two-way analysis allows identification of the most relevant tables for their dwelling risk profiles. The tables allow the user to establish the point at which an intervention becomes cost-saving. Figure 2.3 gives an overview of how to interpret two-way sensitivity analysis. For example, if the intervention costs £50 per dwelling, it would need to reduce the prevalence of asthma within the specified population by 8% to be considered cost-saving to the NHS. It is worth noting that as the results presented were based on a number of assumptions, the focus should be on the colourings, and the distance of the parameter combination from the threshold, rather than on the particular numbers reported.

Figure 2.3: Example of two-way sensitivity analysis



Asthma

Relative reduction in health outcomes due to intervention	Upfront cost of intervention (per dwelling)											
	-£172,797,677	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
	0%	£0	£24,773,904	£49,547,809	£74,321,713	£99,095,617	£123,869,522	£148,643,426	£173,417,331	£198,191,235	£222,965,139	£247,739,044
	1%	-£6,797,332	£17,976,572	£42,750,476	£67,524,381	£92,298,285	£117,072,189	£141,846,094	£166,619,998	£191,393,903	£216,167,807	£240,941,711
	2%	-£13,594,665	£11,179,240	£35,953,144	£60,727,048	£85,500,953	£110,274,857	£135,048,761	£159,822,666	£184,596,570	£209,370,475	£234,144,379
	3%	-£20,391,997	£4,381,907	£29,155,812	£53,929,716	£78,703,620	£103,477,525	£128,251,429	£153,025,333	£177,799,238	£202,573,142	£227,347,047
	4%	-£27,189,329	-£2,415,425	£22,358,479	£47,132,384	£71,906,288	£96,680,192	£121,454,097	£146,228,001	£171,001,905	£195,775,810	£220,549,714
	5%	-£33,986,662	-£9,212,757	£15,561,147	£40,335,051	£65,108,956	£89,882,860	£114,656,764	£139,430,669	£164,204,573	£188,978,477	£213,752,382
	6%	-£40,783,994	-£16,010,090	[illegible]	£33,537,719	£58,311,623	£83,085,528	£107,859,432	£132,633,336	£157,407,241	£182,181,145	£206,955,049
	7%	-£47,581,327	-£22,807,422	£1,966,482	£26,740,387	£51,514,291	£76,288,195	£101,062,100	£125,836,004	£150,609,908	£175,383,813	£200,157,717
	8%	-£54,378,659	-£29,604,755	-£4,830,850	£19,943,054	£44,716,959	£69,490,863	£94,264,767	£119,038,672	£143,812,576	£168,586,480	£193,360,385
	9%	-£61,175,991	-£36,402,087	[illegible]	£13,145,722	£37,919,626	£62,693,531	£87,467,435	£112,241,339	£137,015,244	£161,789,148	£186,563,052
	10%	-£67,973,324	-£43,199,419	-£18,425,515	£6,348,389	£31,122,294	£55,896,198	£80,670,103	£105,444,007	£130,217,911	£154,991,816	£179,765,720

Section 3: Results

3.1 COMMUNITY HEALTH WORKER INTERVENTION (Illustrative Example)

3.1.1 Background

During an extra committee meeting in January 2019, the committee were mindful to recommend an intensive intervention involving in-home environmental assessments, education, support for behaviour change, and the provision of resources to reduce exposure to triggers of asthma. However, they were concerned that it may not be cost-effective. A US study by Krieger *et al*., (2005) [1] assessed similar interventions and was, therefore, considered useful for illustrative purposes and as an attempt to answer the committee's concerns. Section 3.1.2 to Section 3.1.5 outline the methods used to run this intervention through the model and the subsequent cost-effectiveness results.

3.1.2 Methods

Both interventions assessed by Krieger *et al*., (2005) [1] consisted of a structured home environmental assessment by a community health worker, delivered over the time period of one year. Those in the high intensity group received additional visits from the health worker to encourage the completion of any action plans, provide education and social support, deliver resources to reduce exposures, offer assistance with cockroach and rodent eradication and advocate for improved housing conditions.

It is currently unclear if a role equivalent to that of a US community health worker currently exists in the United Kingdom. Although, it is expected to combine elements of the role of an environmental health officer and that of a health care professional. To overcome this uncertainty, the results below have been presented for three scenarios that assume the deliverer of such a service is an:

- Environmental health worker
- Home care worker
- Support and outreach worker

Because the mean visit length within the high-intensity group was an hour in the Krieger *et al*., (2005) study, it was assumed that the mean visit length within the United Kingdom would also be one hour per property. Therefore, the hourly unit cost for each healthcare professional has been provided in Table 3.1. Because of the lack of generalisability between the study location and the United Kingdom, and the extremely varied range of interventions recommended by the community health worker (ranging from allergy-controlled pillows to smoking cessation counselling), the costs associated with the provision of additional materials following an environmental assessment have not been accounted for within this analysis. Furthermore, the proportion of households receiving each intervention was not reported in the paper. Therefore, it is likely that the cost of the intervention has been underestimated.

Table 3.1: Hourly unit cost of intervention deliverers

Occupation of deliverer	Unit cost (hourly)	Source
Environmental health worker	£11.58	[23]
Home care worker	£27.00	PSSRU 2018 [24]
Support and outreach worker	£23.00	PSSRU 2018 [24]

Within the Krieger *et al*., (2005) study, the high-intensity intervention resulted in a 60% decrease in days with symptoms/ 2 weeks and a 64% reduction in the use of urgent health service use / 2 months. It has been assumed that the reduction in the use of urgent health services occurred due to a reduction in symptomatic cases of asthma and that the high-intensity intervention would lead to a 64% relative reduction in health condition associated symptoms within the relevant population. The patient population included in the Krieger *et al*., (2005) study was children aged 4 to 12 years with persistent asthma. For simplicity, whilst incorporating the whole UK population, individuals within the model were not separated into different age groups or by health condition severity. Therefore, it was not possible to apply this efficacy value to specifically children with asthma, or those with uncontrolled asthma only. As described in Section 2.2.8, asthma has been modelled as a case mix throughout the year, assuming that on average, every person (of any age) with asthma is uncontrolled for 0.5 weeks a year (approximately one percent of the 52 weeks of the year). It has, therefore, been assumed that the population treatment efficacy of this high intensity intervention is 1% of 64%. To align with these values, the efficacy of the intervention has been varied between 0% and 10% in the two-way analysis tables presented below.

A household was eligible for the Krieger *et al*., (2005) study if its income was below 200% of the 1996 federal poverty threshold. Therefore, it was assumed that if the intervention were implemented in the United Kingdom, it would only be offered to households that classified under the “extreme risk” category, as presented in Figure 2.2. Therefore, results have only been presented for this category. Furthermore, as the study only focussed upon indoor asthma triggers, only the cost savings associated with the health condition of asthma have been considered within the results presented below in Sections 3.1.3 to 3.1.5. Due to a lack of data, the cost-savings of the intervention associated with the alternative health conditions included in the economic model (chronic obstructive pulmonary disease, allergic rhinitis and generalised anxiety disorder) have not been presented within this section.

With the exception of the intervention costs and relative reduction in health condition associated symptoms due to the implementation of the intervention, all other model inputs are equal to those used in the two-way sensitivity analysis described in Section 3.2.

The results are presented as a set of two-way analyses which allow the reader to identify the most relevant tables for their dwelling physical risk characteristics. The tables allow the reader to establish the point at which an intervention becomes cost saving, under varying numbers of annual visits from the intervention provider. To align with the Krieger et al., (2005) study, it has been assumed that health care professionals made a mean number of seven visits to each participant in the base case analysis, which has been highlighted in the midpoint of the black square in each two-way table. Within the results it has also been assumed that 100% of households with an excess risk profile had implemented the intervention.

3.1.3 Results: Environmental Health Worker

Figure 3.1 to Figure 3.3 demonstrate that as the level of effectiveness increases, the number of annual visits per dwelling can be higher and the intervention remain cost saving. The same relationship was visible throughout all types of dwellings, whether non-decent, a usable floor area <90m^2 or with a damp problem. For example, if the intervention had a six percent efficacy rate, a maximum of 16 visits from an environmental health worker a year could be provided and be cost saving for an extreme risk dwelling. However, this would fall to four visits if the intervention had a two percent efficacy rate. Within the base-case analysis (which has been highlighted in the midpoint of the black square in each two-way table), it can be seen that the intervention is unlikely to be cost saving for any households with any risk profile characteristics, despite the fact that the cost of the intervention has been underestimated. Conversely, because the economic model takes the perspective of the NHS, the potential benefits of this intervention are restricted to health care savings, whilst it non-health care benefits are also expected.

Figure 3.1: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (non-decent homes) (discounted)

		Number of visits per household (annually)										
	-£34,567,461	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,289,132	£6,578,264	£9,867,395	£13,156,527	£16,445,659	£19,734,791	£23,023,922	£26,313,054	£29,602,186	£32,891,318
	1%	-£4,607,942	-£1,318,810	£1,970,321	£5,259,453	£8,548,585	£11,837,717	£15,126,848	£18,415,980	£21,705,112	£24,994,244	£28,283,376
	2%	-£9,215,884	-£5,926,753	-£2,637,621	£651,511	£3,940,643	£7,229,774	£10,518,906	£13,808,038	£17,097,170	£20,386,302	£23,675,433
	3%	-£13,823,827	-£10,534,695	-£7,245,563	-£3,956,431	-£667,300	£2,621,832	£5,910,964	£9,200,096	£12,489,228	£15,778,359	£19,067,491
	4%	-£18,431,769	-£15,142,637	-£11,853,505	-£8,564,374	-£5,275,242	-£1,986,110	£1,303,022	£4,592,154	£7,881,285	£11,170,417	£14,459,549
	5%	-£23,039,711	-£19,750,579	-£16,461,447	-£13,172,316	-£9,883,184	-£6,594,052	-£3,304,920	-£15,789	£3,273,343	£6,562,475	£9,851,607
	6%	-£27,647,653	-£24,358,521	-£21,069,390	-£17,780,258	-£14,491,126	-£11,201,994	-£7,912,863	-£4,623,731	-£1,334,599	£1,954,533	£5,243,665
	7%	-£32,255,595	-£28,966,464	-£25,677,332	-£22,388,200	-£19,099,068	-£15,809,937	-£12,520,805	-£9,231,673	-£5,942,541	-£2,653,409	£635,722
	8%	-£36,863,538	-£33,574,406	-£30,285,274	-£26,996,142	-£23,707,011	-£20,417,879	-£17,128,747	-£13,839,615	-£10,550,483	-£7,261,352	-£3,972,220
	9%	-£41,471,480	-£38,182,348	-£34,893,216	-£31,604,085	-£28,314,953	-£25,025,821	-£21,736,689	-£18,447,557	-£15,158,426	-£11,869,294	-£8,580,162
	10%	-£46,079,422	-£42,790,290	-£39,501,159	-£36,212,027	-£32,922,895	-£29,633,763	-£26,344,631	-£23,055,500	-£19,766,368	-£16,477,236	-£13,188,104

Figure 3.2: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (usable floor area <90m^2) (discounted)

		Number of visits per household (annually)										
	-£52,000,875	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,947,940	£9,895,880	£14,843,821	£19,791,761	£24,739,701	£29,687,641	£34,635,582	£39,583,522	£44,531,462	£49,479,402
	1%	-£6,931,867	-£1,983,926	£2,964,014	£7,911,954	£12,859,894	£17,807,835	£22,755,775	£27,703,715	£32,651,655	£37,599,595	£42,547,536
	2%	-£13,863,733	-£8,915,793	-£3,967,853	£980,088	£5,928,028	£10,875,968	£15,823,908	£20,771,848	£25,719,789	£30,667,729	£35,615,669
	3%	-£20,795,600	-£15,847,659	-£10,899,719	-£5,951,779	-£1,003,839	£3,944,101	£8,892,042	£13,839,982	£18,787,922	£23,735,862	£28,683,803
	4%	-£27,727,466	-£22,779,526	-£17,831,586	-£12,883,646	-£7,935,705	-£2,987,765	£1,960,175	£6,908,115	£11,856,056	£16,803,996	£21,751,936
	5%	-£34,659,333	-£29,711,393	-£24,763,452	-£19,815,512	-£14,867,572	-£9,919,632	-£4,971,692	-£23,751	£4,924,189	£9,872,129	£14,820,069
	6%	-£41,591,199	-£36,643,259	-£31,695,319	-£26,747,379	-£21,799,439	-£16,851,498	-£11,903,558	-£6,955,618	-£2,007,678	£2,940,263	£7,888,203
	7%	-£48,523,066	-£43,575,126	-£38,627,186	-£33,679,245	-£28,731,305	-£23,783,365	-£18,835,425	-£13,887,484	-£8,939,544	-£3,991,604	£956,336
	8%	-£55,454,933	-£50,506,992	-£45,559,052	-£40,611,112	-£35,663,172	-£30,715,231	-£25,767,291	-£20,819,351	-£15,871,411	-£10,923,471	-£5,975,530
	9%	-£62,386,799	-£57,438,859	-£52,490,919	-£47,542,978	-£42,595,038	-£37,647,098	-£32,699,158	-£27,751,218	-£22,803,277	-£17,855,337	-£12,907,397
	10%	-£69,318,666	-£64,370,725	-£59,422,785	-£54,474,845	-£49,526,905	-£44,578,965	-£39,631,024	-£34,683,084	-£29,735,144	-£24,787,204	-£19,839,263

Figure 3.3: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (any damp problem) (discounted)

		Number of visits per household (annually)										
	-£7,238,029	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£688,706	£1,377,413	£2,066,119	£2,754,826	£3,443,532	£4,132,238	£4,820,945	£5,509,651	£6,198,358	£6,887,064
	1%	-£964,850	-£276,144	£412,563	£1,101,269	£1,789,975	£2,478,682	£3,167,388	£3,856,095	£4,544,801	£5,233,507	£5,922,214
	2%	-£1,929,700	-£1,240,994	-£552,287	£136,419	£825,125	£1,513,832	£2,202,538	£2,891,244	£3,579,951	£4,268,657	£4,957,364
	3%	-£2,894,550	-£2,205,844	-£1,517,138	-£828,431	-£139,725	£548,982	£1,237,688	£1,926,394	£2,615,101	£3,303,807	£3,992,514
	4%	-£3,859,401	-£3,170,694	-£2,481,988	-£1,793,281	-£1,104,575	-£415,869	£272,838	£961,544	£1,650,251	£2,338,957	£3,027,663
	5%	-£4,824,251	-£4,135,544	-£3,446,838	-£2,758,132	-£2,069,425	-£1,380,719	-£692,012	-£3,306	£685,400	£1,374,107	£2,062,813
	6%	-£5,789,101	-£5,100,394	-£4,411,688	-£3,722,982	-£3,034,275	-£2,345,569	-£1,656,862	-£968,156	-£279,450	£409,257	£1,097,963
	7%	-£6,753,951	-£6,065,245	-£5,376,538	-£4,687,832	-£3,999,125	-£3,310,419	-£2,621,713	-£1,933,006	-£1,244,300	-£555,593	£133,113
	8%	-£7,718,801	-£7,030,095	-£6,341,388	-£5,652,682	-£4,963,976	-£4,275,269	-£3,586,563	-£2,897,856	-£2,209,150	-£1,520,444	-£831,737
	9%	-£8,683,651	-£7,994,945	-£7,306,239	-£6,617,532	-£5,928,826	-£5,240,119	-£4,551,413	-£3,862,707	-£3,174,000	-£2,485,294	-£1,796,587
	10%	-£9,648,501	-£8,959,795	-£8,271,089	-£7,582,382	-£6,893,676	-£6,204,969	-£5,516,263	-£4,827,557	-£4,138,850	-£3,450,144	-£2,761,437

3.1.4 Results: Home Care Worker

Figure 3.4 to Figure 3.6 demonstrate that at as the level of effectiveness increases, the number of annual visits per dwelling can be higher and remain cost saving. The same relationship was visible throughout all types of dwellings, whether non-decent, a usable floor area <90m^2 or with a damp problem. For example, if the intervention had a six percent efficacy rate, a maximum of six visits from a home care worker a year could be provided and be cost saving for an extreme risk dwelling. Furthermore, this would fall to two visits if the intervention had a two percent efficacy. However, it is worth noting that there may be a relationship between the number of visits and efficacy such that a higher number of visits per year is associated with greater efficacy. Therefore, it is not unreasonable to assume that a high number of visits will have a large impact on the reduction of symptomatic cases of asthma. Within the base-case analysis (which has been highlighted with a black square in each two-way table), it can be seen that the intervention is unlikely to be cost saving for households with any risk profile characteristics, despite the fact that the cost of the intervention has been underestimated.

Figure 3.4: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (non-decent homes) (discounted)

		Number of visits per household (annually)										
	-£19,245,469	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£7,666,844	£15,333,688	£23,000,532	£30,667,375	£38,334,219	£46,001,063	£53,667,907	£61,334,751	£69,001,595	£76,668,439
	1%	-£4,607,942	£3,058,902	£10,725,746	£18,392,589	£26,059,433	£33,726,277	£41,393,121	£49,059,965	£56,726,809	£64,393,653	£72,060,497
	2%	-£9,215,884	-£1,549,041	£6,117,803	£13,784,647	£21,451,491	£29,118,335	£36,785,179	£44,452,023	£52,118,867	£59,785,710	£67,452,554
	3%	-£13,823,827	-£6,156,983	£1,509,861	£9,176,705	£16,843,549	£24,510,393	£32,177,237	£39,844,080	£47,510,924	£55,177,768	£62,844,612
	4%	-£18,431,769	-£10,764,925	-£3,098,081	£4,568,763	£12,235,607	£19,902,451	£27,569,294	£35,236,138	£42,902,982	£50,569,826	£58,236,670
	5%	-£23,039,711	-£15,372,867	-£7,706,023	-£39,179	£7,627,664	£15,294,508	£22,961,352	£30,628,196	£38,295,040	£45,961,884	£53,628,728
	6%	-£27,647,653	-£19,980,809	-£12,313,966	-£4,647,122	£3,019,722	£10,686,566	£18,353,410	£26,020,254	£33,687,098	£41,353,942	£49,020,785
	7%	-£32,255,595	-£24,588,752	-£16,921,908	-£9,255,064	-£1,588,220	£6,078,624	£13,745,468	£21,412,312	£29,079,156	£36,745,999	£44,412,843
	8%	-£36,863,538	-£29,196,694	-£21,529,850	-£13,863,006	-£6,196,162	£1,470,682	£9,137,526	£16,804,369	£24,471,213	£32,138,057	£39,804,901
	9%	-£41,471,480	-£33,804,636	-£26,137,792	-£18,470,948	-£10,804,104	-£3,137,261	£4,529,583	£12,196,427	£19,863,271	£27,530,115	£35,196,959
	10%	-£46,079,422	-£38,412,578	-£30,745,734	-£23,078,890	-£15,412,047	-£7,745,203	-£78,359	£7,588,485	£15,255,329	£22,922,173	£30,589,017

Figure 3.5: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (usable floor area <90m^2) (discounted)

		Number of visits per household (annually)										
	-£28,951,539	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£11,533,465	£23,066,929	£34,600,394	£46,133,859	£57,667,323	£69,200,788	£80,734,253	£92,267,717	£103,801,182	£115,334,647
	1%	-£6,931,867	£4,601,598	£16,135,063	£27,668,527	£39,201,992	£50,735,457	£62,268,922	£73,802,386	£85,335,851	£96,869,316	£108,402,780
	2%	-£13,863,733	-£2,330,268	£9,203,196	£20,736,661	£32,270,126	£43,803,590	£55,337,055	£66,870,520	£78,403,984	£89,937,449	£101,470,914
	3%	-£20,795,600	-£9,262,135	£2,271,330	£13,804,794	£25,338,259	£36,871,724	£48,405,188	£59,938,653	£71,472,118	£83,005,582	£94,539,047
	4%	-£27,727,466	-£16,194,002	-£4,660,537	£6,872,928	£18,406,392	£29,939,857	£41,473,322	£53,006,787	£64,540,251	£76,073,716	£87,607,181
	5%	-£34,659,333	-£23,125,868	-£11,592,403	-£58,939	£11,474,526	£23,007,991	£34,541,455	£46,074,920	£57,608,385	£69,141,849	£80,675,314
	6%	-£41,591,199	-£30,057,735	-£18,524,270	-£6,990,805	£4,542,659	£16,076,124	£27,609,589	£39,143,053	£50,676,518	£62,209,983	£73,743,447
	7%	-£48,523,066	-£36,989,601	-£25,456,137	-£13,922,672	-£2,389,207	£9,144,257	£20,677,722	£32,211,187	£43,744,651	£55,278,116	£66,811,581
	8%	-£55,454,933	-£43,921,468	-£32,388,003	-£20,854,538	-£9,321,074	£2,212,391	£13,745,856	£25,279,320	£36,812,785	£48,346,250	£59,879,714
	9%	-£62,386,799	-£50,853,334	-£39,319,870	-£27,786,405	-£16,252,940	-£4,719,476	£6,813,989	£18,347,454	£29,880,918	£41,414,383	£52,947,848
	10%	-£69,318,666	-£57,785,201	-£46,251,736	-£34,718,272	-£23,184,807	-£11,651,342	-£117,878	£11,415,587	£22,949,052	£34,482,516	£46,015,981

Figure 3.6: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (any damp problem) (discounted)

		Number of visits per household (annually)										
	-£4,029,780	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£1,605,349	£3,210,698	£4,816,047	£6,421,396	£8,026,745	£9,632,094	£11,237,443	£12,842,792	£14,448,141	£16,053,490
	1%	-£964,850	£640,499	£2,245,848	£3,851,197	£5,456,546	£7,061,895	£8,667,244	£10,272,593	£11,877,942	£13,483,291	£15,088,640
	2%	-£1,929,700	-£324,351	£1,280,998	£2,886,347	£4,491,696	£6,097,045	£7,702,394	£9,307,743	£10,913,092	£12,518,441	£14,123,790
	3%	-£2,894,550	-£1,289,201	£316,148	£1,921,497	£3,526,846	£5,132,195	£6,737,544	£8,342,893	£9,948,242	£11,553,591	£13,158,940
	4%	-£3,859,401	-£2,254,052	-£648,703	£956,646	£2,561,995	£4,167,344	£5,772,693	£7,378,042	£8,983,391	£10,588,740	£12,194,089
	5%	-£4,824,251	-£3,218,902	-£1,613,553	-£8,204	£1,597,145	£3,202,494	£4,807,843	£6,413,192	£8,018,541	£9,623,890	£11,229,239
	6%	-£5,789,101	-£4,183,752	-£2,578,403	-£973,054	£632,295	£2,237,644	£3,842,993	£5,448,342	£7,053,691	£8,659,040	£10,264,389
	7%	-£6,753,951	-£5,148,602	-£3,543,253	-£1,937,904	-£332,555	£1,272,794	£2,878,143	£4,483,492	£6,088,841	£7,694,190	£9,299,539
	8%	-£7,718,801	-£6,113,452	-£4,508,103	-£2,902,754	-£1,297,405	£307,944	£1,913,293	£3,518,642	£5,123,991	£6,729,340	£8,334,689
	9%	-£8,683,651	-£7,078,302	-£5,472,953	-£3,867,604	-£2,262,255	-£656,906	£948,443	£2,553,792	£4,159,141	£5,764,490	£7,369,839
	10%	-£9,648,501	-£8,043,152	-£6,437,803	-£4,832,454	-£3,227,105	-£1,621,756	-£16,407	£1,588,942	£3,194,291	£4,799,640	£6,404,989

3.1.5 Results: Support and Outreach Worker

Figure 3.7 to Figure 3.9 demonstrate that as the level of effectiveness increases, the number of annual visits per dwelling can be higher and remain cost saving. The same relationship was visible throughout all types of dwellings, whether non-decent, a usable floor area <90m^2 or with a damp problem. For example, if the intervention had a six percent efficacy rate, a maximum of eight visits from a support and outreach worker a year could be provided and be cost saving for an extreme risk dwelling. Furthermore, this would fall to two visits if the intervention had a two percent efficacy. Within the base-case analysis (which has been highlighted with a black square in each two-way table), it can be seen that the intervention is unlikely to be cost saving for households with any risk profile characteristics, despite the fact that the cost of the intervention has been underestimated.

Figure 3.7: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (non-decent homes) (discounted)

		Number of visits per household (annually)										
	-£23,220,869	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£6,531,015	£13,062,030	£19,593,045	£26,124,061	£32,655,076	£39,186,091	£45,717,106	£52,248,121	£58,779,136	£65,310,152
	1%	-£4,607,942	£1,923,073	£8,454,088	£14,985,103	£21,516,118	£28,047,134	£34,578,149	£41,109,164	£47,640,179	£54,171,194	£60,702,209
	2%	-£9,215,884	-£2,684,869	£3,846,146	£10,377,161	£16,908,176	£23,439,191	£29,970,206	£36,501,222	£43,032,237	£49,563,252	£56,094,267
	3%	-£13,823,827	-£7,292,811	-£761,796	£5,769,219	£12,300,234	£18,831,249	£25,362,264	£31,893,279	£38,424,295	£44,955,310	£51,486,325
	4%	-£18,431,769	-£11,900,754	-£5,369,739	£1,161,277	£7,692,292	£14,223,307	£20,754,322	£27,285,337	£33,816,352	£40,347,368	£46,878,383
	5%	-£23,039,711	-£16,508,696	-£9,977,681	-£3,446,666	£3,084,350	£9,615,365	£16,146,380	£22,677,395	£29,208,410	£35,739,425	£42,270,440
	6%	-£27,647,653	-£21,116,638	-£14,585,623	-£8,054,608	-£1,523,593	£5,007,423	£11,538,438	£18,069,453	£24,600,468	£31,131,483	£37,662,498
	7%	-£32,255,595	-£25,724,580	-£19,193,565	-£12,662,550	-£6,131,535	£399,480	£6,930,495	£13,461,511	£19,992,526	£26,523,541	£33,054,556
	8%	-£36,863,538	-£30,332,523	-£23,801,507	-£17,270,492	-£10,739,477	-£4,208,462	£2,322,553	£8,853,568	£15,384,584	£21,915,599	£28,446,614
	9%	-£41,471,480	-£34,940,465	-£28,409,450	-£21,878,434	-£15,347,419	-£8,816,404	-£2,285,389	£4,245,626	£10,776,641	£17,307,656	£23,838,672
	10%	-£46,079,422	-£39,548,407	-£33,017,392	-£26,486,377	-£19,955,361	-£13,424,346	-£6,893,331	-£362,316	£6,168,699	£12,699,714	£19,230,729

Figure 3.8: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (usable floor area <90m^2) (discounted)

		Number of visits per household (annually)										
	-£34,931,854	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£9,824,803	£19,649,606	£29,474,410	£39,299,213	£49,124,016	£58,948,819	£68,773,623	£78,598,426	£88,423,229	£98,248,032
	1%	-£6,931,867	£2,892,937	£12,717,740	£22,542,543	£32,367,346	£42,192,150	£52,016,953	£61,841,756	£71,666,559	£81,491,363	£91,316,166
	2%	-£13,863,733	-£4,038,930	£5,785,873	£15,610,677	£25,435,480	£35,260,283	£45,085,086	£54,909,890	£64,734,693	£74,559,496	£84,384,299
	3%	-£20,795,600	-£10,970,796	-£1,145,993	£8,678,810	£18,503,613	£28,328,417	£38,153,220	£47,978,023	£57,802,826	£67,627,630	£77,452,433
	4%	-£27,727,466	-£17,902,663	-£8,077,860	£1,746,943	£11,571,747	£21,396,550	£31,221,353	£41,046,156	£50,870,960	£60,695,763	£70,520,566
	5%	-£34,659,333	-£24,834,530	-£15,009,726	-£5,184,923	£4,639,880	£14,464,683	£24,289,487	£34,114,290	£43,939,093	£53,763,896	£63,588,700
	6%	-£41,591,199	-£31,766,396	-£21,941,593	-£12,116,790	-£2,291,986	£7,532,817	£17,357,620	£27,182,423	£37,007,227	£46,832,030	£56,656,833
	7%	-£48,523,066	-£38,698,263	-£28,873,459	-£19,048,656	-£9,223,853	£600,950	£10,425,754	£20,250,557	£30,075,360	£39,900,163	£49,724,967
	8%	-£55,454,933	-£45,630,129	-£35,805,326	-£25,980,523	-£16,155,720	-£6,330,916	£3,493,887	£13,318,690	£23,143,493	£32,968,297	£42,793,100
	9%	-£62,386,799	-£52,561,996	-£42,737,193	-£32,912,389	-£23,087,586	-£13,262,783	-£3,437,980	£6,386,824	£16,211,627	£26,036,430	£35,861,233
	10%	-£69,318,666	-£59,493,862	-£49,669,059	-£39,844,256	-£30,019,453	-£20,194,649	-£10,369,846	-£545,043	£9,279,760	£19,104,564	£28,929,367

Figure 3.9: Incremental total cost varying the effectiveness and number of annual visits per household (asthma – extreme risk): 100% implementation rate (any damp problem) (discounted)

		Number of visits per household (annually)										
	-£4,862,183	0	2	4	6	8	10	12	14	16	18	20
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£1,367,520	£2,735,039	£4,102,559	£5,470,078	£6,837,598	£8,205,117	£9,572,637	£10,940,156	£12,307,676	£13,675,195
	1%	-£964,850	£402,669	£1,770,189	£3,137,708	£4,505,228	£5,872,747	£7,240,267	£8,607,786	£9,975,306	£11,342,826	£12,710,345
	2%	-£1,929,700	-£562,181	£805,339	£2,172,858	£3,540,378	£4,907,897	£6,275,417	£7,642,936	£9,010,456	£10,377,975	£11,745,495
	3%	-£2,894,550	-£1,527,031	-£159,511	£1,208,008	£2,575,528	£3,943,047	£5,310,567	£6,678,086	£8,045,606	£9,413,125	£10,780,645
	4%	-£3,859,401	-£2,491,881	-£1,124,362	£243,158	£1,610,677	£2,978,197	£4,345,717	£5,713,236	£7,080,756	£8,448,275	£9,815,795
	5%	-£4,824,251	-£3,456,731	-£2,089,212	-£721,692	£645,827	£2,013,347	£3,380,866	£4,748,386	£6,115,905	£7,483,425	£8,850,944
	6%	-£5,789,101	-£4,421,581	-£3,054,062	-£1,686,542	-£319,023	£1,048,497	£2,416,016	£3,783,536	£5,151,055	£6,518,575	£7,886,094
	7%	-£6,753,951	-£5,386,431	-£4,018,912	-£2,651,392	-£1,283,873	£83,647	£1,451,166	£2,818,686	£4,186,205	£5,553,725	£6,921,244
	8%	-£7,718,801	-£6,351,282	-£4,983,762	-£3,616,243	-£2,248,723	-£881,204	£486,316	£1,853,835	£3,221,355	£4,588,875	£5,956,394
	9%	-£8,683,651	-£7,316,132	-£5,948,612	-£4,581,093	-£3,213,573	-£1,846,054	-£478,534	£888,985	£2,256,505	£3,624,024	£4,991,544
	10%	-£9,648,501	-£8,280,982	-£6,913,462	-£5,545,943	-£4,178,423	-£2,810,904	-£1,443,384	-£75,865	£1,291,655	£2,659,174	£4,026,694

3.2 TWO-WAY SENSITIVITY ANALYSIS

Because there is such a wide range of interventions, physical risk factors and health conditions included in the model, it would not be particularly useful to the PHAC to focus results that were calculated using one set of model inputs. Results for a wide range of scenarios have been presented in the following section, and Appendices A to C, to allow show how the results change when the type of dwelling and/or intervention is changed in order for the results to be applicable and useful. These tables not only allow the stakeholder to see if an intervention is likely to result in cost savings but also to choose between interventions. When faced with a choice of home-based interventions to implement, they can allow the stakeholder to see the type of intervention that is most likely to result in cost savings.

The following inputs are used in the model to produce the results presented below and those in the appendices:

- Intervention cost per household: £100 (appendices only)
- Total number of houses in England: 23,732,635
- Physical risk factor: non-decent homes
- Proportion of population **with** physical risk factor, with additional excess risk factor (equal for all property tenure):
    - Low risk dwellings – 50%
    - Extreme risk dwellings – 3%
- Proportion of population **without** physical risk factor, with additional excess risk factor (equal for all property tenure):
    - Low risk dwellings – 0%
    - Extreme risk dwellings – 0%
- Increased prevalence due to both physical and excess risk factor (equal for all health conditions):
    - Low risk dwellings – 25%
    - Extreme risk factors – 125%
- Percentage of dwellings with excess risk profile implementing intervention (equal for all dwelling tenures) – 100%
- Relative reduction in health condition associated symptoms due to the implementation of the intervention – 10% (appendices only)

The physical risk factor ‘non-decent homes’ was included in the analysis because this factor prompted the most discussion at the PHAC meetings. The health condition ‘asthma’ was focussed on within the sensitivity analysis presented below for the same reason. Results for all physical risk factors and health conditions are presented in Appendices A to C.

The proportion of the population assigned to each risk profile, and the increased risk of a symptomatic health condition associated with each risk profile is aligned with the numbers presented in Figure 2.2.

Due to the uncertainty in the inputs, and the lack of data, the results have been presented as a threshold analysis, highlighting at which cost and/or efficacy an intervention would no longer be cost-saving. allows a stakeholder to pin point where the dwelling and intervention would be in the table, identify the likelihood of an intervention being cost-saving and to see where the uncertainty lies.

Figure 3.10 to Figure 3.14 demonstrate that, as the risk profile of a dwelling increases, the capacity to benefit also increases. At a given level of effectiveness, the cost of the intervention can be higher for a dwelling with a greater risk threshold, and remain cost-saving. An intervention with a 7% efficacy rate may cost up to £50 and be cost saving for a low risk dwelling (blue circle, Figure 3.10), whilst this can rise to approximately £225 for a dwelling with an extreme risk profile (purple circle, Figure 3.14). This type of threshold analysis could help a stakeholder make the decision as to whether to implement an intervention to reduce exposure to indoor air pollution. If a dwelling has a low risk profile, the stakeholder can be reasonably certain that an intervention priced at £100 is unlikely to result in cost-savings if it does not reduce symptomatic cases of asthma by 10% or more. As stated in Section 2.2.7, the plausible range of effectiveness was set from 0% to 10%, which is represented by the left column of the tables. Figure 3.15 to Figure 3.19 show the effect when the implementation rate is varied to 50%. All other factors are held constant as described in the base case. This graph would, therefore, look different if other inputs were changed.

Figure 3.10: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – low risk): 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£403,080	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£59,157,746	£118,315,492	£177,473,238	£236,630,984	£295,788,730	£354,946,476	£414,104,222	£473,261,968	£532,419,714	£591,577,459
	1%	-£23,703,406	£35,454,340	£94,612,085	£153,769,831	£212,927,577	£272,085,323	£331,243,069	£390,400,815	£449,558,561	£508,716,307	£567,874,053
	2%	-£47,406,813	£11,750,933	£70,908,679	£130,066,425	£189,224,171	£248,381,917	£307,539,663	£366,697,409	£425,855,155	£485,012,901	£544,170,647
	3%	-£71,110,219	-£11,952,473	£47,205,273	£106,363,019	£165,520,765	£224,678,510	£283,836,256	£342,994,002	£402,151,748	£461,309,494	£520,467,240
	4%	-£94,813,626	-£35,655,880	£23,501,866	£82,659,612	£141,817,358	£200,975,104	£260,132,850	£319,290,596	£378,448,342	£437,606,088	£496,763,834
	5%	-£118,517,032	-£59,359,286	-£201,540	£58,956,206	£118,113,952	£177,271,698	£236,429,444	£295,587,190	£354,744,935	£413,902,681	£473,060,427
	6%	-£142,220,439	-£83,062,693	-£23,904,947	£35,252,799	£94,410,545	£153,568,291	£212,726,037	£271,883,783	£331,041,529	£390,199,275	£449,357,021
	7%	-£165,923,845	-£106,766,099	-£47,608,353	£11,549,393	£70,707,139	£129,864,885	£189,022,631	£248,180,377	£307,338,123	£366,495,869	£425,653,614
	8%	-£189,627,251	-£130,469,505	[illegible]	-£12,154,014	£47,003,732	£106,161,478	£165,319,224	£224,476,970	£283,634,716	£342,792,462	£401,950,208
	9%	-£213,330,658	-£154,172,912	-£95,015,166	-£35,857,420	£23,300,326	£82,458,072	£141,615,818	£200,773,564	£259,931,310	£319,089,056	£378,246,802
	10%	-£237,034,064	-£177,876,318	-£118,718,572	-£59,560,826	-£403,080	£58,754,665	£117,912,411	£177,070,157	£236,227,903	£295,385,649	£354,543,395

Figure 3.11: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – moderate risk): 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£38,086,682	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£23,663,098	£47,326,197	£70,989,295	£94,652,394	£118,315,492	£141,978,590	£165,641,689	£189,304,787	£212,967,885	£236,630,984
	1%	-£13,273,908	£10,389,191	£34,052,289	£57,715,388	£81,378,486	£105,041,584	£128,704,683	£152,367,781	£176,030,879	£199,693,978	£223,357,076
	2%	-£26,547,815	-£2,884,717	£20,778,382	£44,441,480	£68,104,578	£91,767,677	£115,430,775	£139,093,873	£162,756,972	£186,420,070	£210,083,169
	3%	-£39,821,723	-£16,158,624	£7,504,474	£31,167,572	£54,830,671	£78,493,769	£102,156,867	£125,819,966	£149,483,064	£173,146,163	£196,809,261
	4%	-£53,095,630	-£29,432,532	-£5,769,434	£17,893,665	£41,556,763	£65,219,861	£88,882,960	£112,546,058	£136,209,157	£159,872,255	£183,535,353
	5%	-£66,369,538	-£42,706,440	-£19,043,341	£4,619,757	£28,282,856	£51,945,954	£75,609,052	£99,272,151	£122,935,249	£146,598,347	£170,261,446
	6%	-£79,643,446	-£55,980,347	-£32,317,249	-£8,654,150	£15,008,948	£38,672,046	£62,335,145	£85,998,243	£109,661,341	£133,324,440	£156,987,538
	7%	-£92,917,353	-£69,254,255	-£45,591,156	-£21,928,058	£1,735,040	£25,398,139	£49,061,237	£72,724,335	£96,387,434	£120,050,532	£143,713,631
	8%	-£106,191,261	-£82,528,162	-£58,865,064	-£35,201,966	-£11,538,867	£12,124,231	£35,787,329	£59,450,428	£83,113,526	£106,776,625	£130,439,723
	9%	-£119,465,168	-£95,802,070	-£72,138,972	-£48,475,873	-£24,812,775	-£1,149,676	£22,513,422	£46,176,520	£69,839,619	£93,502,717	£117,165,815
	10%	-£132,739,076	-£109,075,978	-£85,412,879	-£61,749,781	-£38,086,682	-£14,423,584	£9,239,514	£32,902,613	£56,565,711	£80,228,809	£103,891,908

Figure 3.12: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – high risk): 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£82,064,082	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£21,296,789	£42,593,577	£63,890,366	£85,187,154	£106,483,943	£127,780,731	£149,077,520	£170,374,308	£191,671,097	£212,967,885
	1%	-£16,725,124	£4,571,665	£25,868,454	£47,165,242	£68,462,031	£89,758,819	£111,055,608	£132,352,396	£153,649,185	£174,945,973	£196,242,762
	2%	-£33,450,247	-£12,153,459	£9,143,330	£30,440,118	£51,736,907	£73,033,696	£94,330,484	£115,627,273	£136,924,061	£158,220,850	£179,517,638
	3%	-£50,175,371	-£28,878,582	-£7,581,794	£13,714,995	£35,011,783	£56,308,572	£77,605,361	£98,902,149	£120,198,938	£141,495,726	£162,792,515
	4%	-£66,900,494	-£45,603,706	-£24,306,917	-£3,010,129	£18,286,660	£39,583,448	£60,880,237	£82,177,025	£103,473,814	£124,770,603	£146,067,391
	5%	-£83,625,618	-£62,328,829	-£41,032,041	-£19,735,252	£1,561,536	£22,858,325	£44,155,113	£65,451,902	£86,748,690	£108,045,479	£129,342,268
	6%	-£100,350,741	-£79,053,953	-£57,757,164	-£36,460,376	-£15,163,587	£6,133,201	£27,429,990	£48,726,778	£70,023,567	£91,320,355	£112,617,144
	7%	-£117,075,865	-£95,779,076	-£74,482,288	-£53,185,499	-£31,888,711	-£10,591,922	£10,704,866	£32,001,655	£53,298,443	£74,595,232	£95,892,020
	8%	-£133,800,989	-£112,504,200	-£91,207,412	-£69,910,623	-£48,613,834	-£27,317,046	-£6,020,257	£15,276,531	£36,573,320	£57,870,108	£79,166,897
	9%	-£150,526,112	-£129,229,324	-£107,932,535	-£86,635,747	-£65,338,958	-£44,042,169	-£22,745,381	-£1,448,592	£19,848,196	£41,144,985	£62,441,773
	10%	-£167,251,236	-£145,954,447	-£124,657,659	-£103,360,870	-£82,064,082	-£60,767,293	-£39,470,505	-£18,173,716	£3,123,073	£24,419,861	£45,716,650

Figure 3.13: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – very high risk): 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£64,925,074	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£10,648,394	£21,296,789	£31,945,183	£42,593,577	£53,241,971	£63,890,366	£74,538,760	£85,187,154	£95,835,548	£106,483,943
	1%	-£10,751,865	-£103,471	£10,544,923	£21,193,318	£31,841,712	£42,490,106	£53,138,500	£63,786,895	£74,435,289	£85,083,683	£95,732,078
	2%	-£21,503,730	-£10,855,336	-£206,942	£10,441,453	£21,089,847	£31,738,241	£42,386,635	£53,035,030	£63,683,424	£74,331,818	£84,980,212
	3%	-£32,255,595	-£21,607,201	-£10,958,807	-£310,413	£10,337,982	£20,986,376	£31,634,770	£42,283,164	£52,931,559	£63,579,953	£74,228,347
	4%	-£43,007,461	-£32,359,066	-£21,710,672	-£11,062,278	-£413,884	£10,234,511	£20,882,905	£31,531,299	£42,179,694	£52,828,088	£63,476,482
	5%	-£53,759,326	-£43,110,932	-£32,462,537	-£21,814,143	-£11,165,749	-£517,354	£10,131,040	£20,779,434	£31,427,828	£42,076,223	£52,724,617
	6%	-£64,511,191	-£53,862,797	-£43,214,402	-£32,566,008	-£21,917,614	-£11,269,220	-£620,825	£10,027,569	£20,675,963	£31,324,358	£41,972,752
	7%	-£75,263,056	-£64,614,662	-£53,966,268	-£43,317,873	-£32,669,479	-£22,021,085	-£11,372,690	-£724,296	£9,924,098	£20,572,492	£31,220,887
	8%	-£86,014,921	-£75,366,527	-£64,718,133	-£54,069,738	-£43,421,344	-£32,772,950	-£22,124,556	-£11,476,161	-£827,767	£9,820,627	£20,469,021
	9%	-£96,766,786	-£86,118,392	-£75,469,998	-£64,821,604	-£54,173,209	-£43,524,815	-£32,876,421	-£22,228,027	-£11,579,632	-£931,238	£9,717,156
	10%	-£107,518,652	-£96,870,257	-£86,221,863	-£75,573,469	-£64,925,074	-£54,276,680	-£43,628,286	-£32,979,892	-£22,331,497	-£11,683,103	-£1,034,709

Figure 3.14: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – extreme risk): 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£31,881,563	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,549,465	£7,098,930	£10,648,394	£14,197,859	£17,747,324	£21,296,789	£24,846,253	£28,395,718	£31,945,183	£35,494,648
	1%	-£4,607,942	-£1,058,477	£2,490,987	£6,040,452	£9,589,917	£13,139,382	£16,688,846	£20,238,311	£23,787,776	£27,337,241	£30,886,705
	2%	-£9,215,884	-£5,666,420	-£2,116,955	£1,432,510	£4,981,975	£8,531,439	£12,080,904	£15,630,369	£19,179,834	£22,729,298	£26,278,763
	3%	-£13,823,827	-£10,274,362	-£6,724,897	-£3,175,432	£374,032	£3,923,497	£7,472,962	£11,022,427	£14,571,891	£18,121,356	£21,670,821
	4%	-£18,431,769	-£14,882,304	-£11,332,839	-£7,783,375	-£4,233,910	-£684,445	£2,865,020	£6,414,484	£9,963,949	£13,513,414	£17,062,879
	5%	-£23,039,711	-£19,490,246	-£15,940,782	-£12,391,317	-£8,841,852	-£5,292,387	-£1,742,923	£1,806,542	£5,356,007	£8,905,472	£12,454,937
	6%	-£27,647,653	-£24,098,189	-£20,548,724	-£16,999,259	-£13,449,794	-£9,900,329	-£6,350,865	-£2,801,400	£748,065	[illegible]	£7,846,994
	7%	-£32,255,595	-£28,706,131	-£25,156,666	-£21,607,201	-£18,057,736	-£14,508,272	-£10,958,807	-£7,409,342	-£3,859,877	-£310,413	£3,239,052
	8%	-£36,863,538	-£33,314,073	-£29,764,608	-£26,215,143	-£22,665,679	-£19,116,214	-£15,566,749	-£12,017,284	-£8,467,820	[illegible]	-£1,368,890
	9%	-£41,471,480	-£37,922,015	-£34,372,550	-£30,823,086	-£27,273,621	-£23,724,156	-£20,174,691	-£16,625,227	-£13,075,762	-£9,526,297	-£5,976,832
	10%	-£46,079,422	-£42,529,957	-£38,980,493	-£35,431,028	-£31,881,563	-£28,332,098	-£24,782,634	-£21,233,169	-£17,683,704	-£14,134,239	-£10,584,775

Non-decent homes – 50% implementation rate

Figure 3.15: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – low risk): 50% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£201,540	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£29,578,873	£59,157,746	£88,736,619	£118,315,492	£147,894,365	£177,473,238	£207,052,111	£236,630,984	£266,209,857	£295,788,730
	1%	-£11,851,703	£17,727,170	£47,306,043	£76,884,916	£106,463,789	£136,042,662	£165,621,535	£195,200,408	£224,779,281	£254,358,154	£283,937,027
	2%	-£23,703,406	£5,875,467	£35,454,340	£65,033,212	£94,612,085	£124,190,958	£153,769,831	£183,348,704	£212,927,577	£242,506,450	£272,085,323
	3%	-£35,555,110	-£5,976,237	£23,602,636	£53,181,509	£82,760,382	£112,339,255	£141,918,128	£171,497,001	£201,075,874	£230,654,747	£260,233,620
	4%	-£47,406,813	-£17,827,940	£11,750,933	£41,329,806	£70,908,679	£100,487,552	£130,066,425	£159,645,298	£189,224,171	£218,803,044	£248,381,917
	5%	-£59,258,516	-£29,679,643	-£100,770	£29,478,103	£59,056,976	£88,635,849	£118,214,722	£147,793,595	£177,372,468	£206,951,341	£236,530,214
	6%	-£71,110,219	-£41,531,346	-£11,952,473	£17,626,400	£47,205,273	£76,784,146	£106,363,019	£135,941,892	£165,520,765	£195,099,637	£224,678,510
	7%	-£82,961,922	-£53,383,050	-£23,804,177	£5,774,696	£35,353,569	£64,932,442	£94,511,315	£124,090,188	£153,669,061	£183,247,934	£212,826,807
	8%	-£94,813,626	-£65,234,753	-£35,655,880	-£6,077,007	£23,501,866	£53,080,739	£82,659,612	£112,238,485	£141,817,358	£171,396,231	£200,975,104
	9%	-£106,665,329	-£77,086,456	-£47,507,583	-£17,928,710	£11,650,163	£41,229,036	£70,807,909	£100,386,782	£129,965,655	£159,544,528	£189,123,401
	10%	-£118,517,032	-£88,938,159	-£59,359,286	-£29,780,413	-£201,540	£29,377,333	£58,956,206	£88,535,079	£118,113,952	£147,692,825	£177,271,698

Figure 3.16: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – moderate risk): 50% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£19,043,341	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£11,831,549	£23,663,098	£35,494,648	£47,326,197	£59,157,746	£70,989,295	£82,820,844	£94,652,394	£106,483,943	£118,315,492
	1%	-£6,636,954	£5,194,595	£17,026,145	£28,857,694	£40,689,243	£52,520,792	£64,352,341	£76,183,891	£88,015,440	£99,846,989	£111,678,538
	2%	-£13,273,908	-£1,442,358	£10,389,191	£22,220,740	£34,052,289	£45,883,838	£57,715,388	£69,546,937	£81,378,486	£93,210,035	£105,041,584
	3%	-£19,910,861	-£8,079,312	£3,752,237	£15,583,786	£27,415,335	£39,246,885	£51,078,434	£62,909,983	£74,741,532	£86,573,081	£98,404,630
	4%	-£26,547,815	-£14,716,266	-£2,884,717	£8,946,832	£20,778,382	£32,609,931	£44,441,480	£56,273,029	£68,104,578	£79,936,128	£91,767,677
	5%	-£33,184,769	-£21,353,220	-£9,521,671	£2,309,879	£14,141,428	£25,972,977	£37,804,526	£49,636,075	£61,467,625	£73,299,174	£85,130,723
	6%	-£39,821,723	-£27,990,174	-£16,158,624	-£4,327,075	£7,504,474	£19,336,023	£31,167,572	£42,999,122	£54,830,671	£66,662,220	£78,493,769
	7%	-£46,458,677	-£34,627,127	-£22,795,578	-£10,964,029	£867,520	£12,699,069	£24,530,619	£36,362,168	£48,193,717	£60,025,266	£71,856,815
	8%	-£53,095,630	-£41,264,081	-£29,432,532	-£17,600,983	-£5,769,434	£6,062,116	£17,893,665	£29,725,214	£41,556,763	£53,388,312	£65,219,861
	9%	-£59,732,584	-£47,901,035	-£36,069,486	-£24,237,937	-£12,406,387	-£574,838	£11,256,711	£23,088,260	£34,919,809	£46,751,359	£58,582,908
	10%	-£66,369,538	-£54,537,989	-£42,706,440	-£30,874,890	-£19,043,341	-£7,211,792	£4,619,757	£16,451,306	£28,282,856	£40,114,405	£51,945,954

Figure 3.17: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – high risk): 50% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£41,032,041	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£10,648,394	£21,296,789	£31,945,183	£42,593,577	£53,241,971	£63,890,366	£74,538,760	£85,187,154	£95,835,548	£106,483,943
	1%	-£8,362,562	£2,285,832	£12,934,227	£23,582,621	£34,231,015	£44,879,410	£55,527,804	£66,176,198	£76,824,592	£87,472,987	£98,121,381
	2%	-£16,725,124	-£6,076,729	£4,571,665	£15,220,059	£25,868,454	£36,516,848	£47,165,242	£57,813,636	£68,462,031	£79,110,425	£89,758,819
	3%	-£25,087,685	-£14,439,291	-£3,790,897	£6,857,497	£17,505,892	£28,154,286	£38,802,680	£49,451,075	£60,099,469	£70,747,863	£81,396,257
	4%	-£33,450,247	-£22,801,853	-£12,153,459	-£1,505,064	£9,143,330	£19,791,724	£30,440,118	£41,088,513	£51,736,907	£62,385,301	£73,033,696
	5%	-£41,812,809	-£31,164,415	-£20,516,020	-£9,867,626	£780,768	£11,429,162	£22,077,557	£32,725,951	£43,374,345	£54,022,739	£64,671,134
	6%	-£50,175,371	-£39,526,976	-£28,878,582	-£18,230,188	-£7,581,794	£3,066,601	£13,714,995	£24,363,389	£35,011,783	£45,660,178	£56,308,572
	7%	-£58,537,933	-£47,889,538	-£37,241,144	-£26,592,750	-£15,944,355	-£5,295,961	£5,352,433	£16,000,827	£26,649,222	£37,297,616	£47,946,010
	8%	-£66,900,494	-£56,252,100	-£45,603,706	-£34,955,311	-£24,306,917	-£13,658,523	-£3,010,129	£7,638,266	£18,286,660	£28,935,054	£39,583,448
	9%	-£75,263,056	-£64,614,662	-£53,966,268	-£43,317,873	-£32,669,479	-£22,021,085	-£11,372,690	-£724,296	£9,924,098	£20,572,492	£31,220,887
	10%	-£83,625,618	-£72,977,224	-£62,328,829	-£51,680,435	-£41,032,041	-£30,383,647	-£19,735,252	-£9,086,858	£1,561,536	£12,209,931	£22,858,325

Figure 3.18: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – very high risk): 50% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£32,462,537	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£5,324,197	£10,648,394	£15,972,591	£21,296,789	£26,620,986	£31,945,183	£37,269,380	£42,593,577	£47,917,774	£53,241,971
	1%	-£5,375,933	-£51,735	£5,272,462	£10,596,659	£15,920,856	£21,245,053	£26,569,250	£31,893,447	£37,217,645	£42,541,842	£47,866,039
	2%	-£10,751,865	-£5,427,668	-£103,471	£5,220,726	£10,544,923	£15,869,121	£21,193,318	£26,517,515	£31,841,712	£37,165,909	£42,490,106
	3%	-£16,127,798	-£10,803,601	-£5,479,403	-£155,206	£5,168,991	£10,493,188	£15,817,385	£21,141,582	£26,465,779	£31,789,976	£37,114,174
	4%	-£21,503,730	-£16,179,533	-£10,855,336	-£5,531,139	-£206,942	£5,117,255	£10,441,453	£15,765,650	£21,089,847	£26,414,044	£31,738,241
	5%	-£26,879,663	-£21,555,466	-£16,231,269	-£10,907,071	-£5,582,874	-£258,677	£5,065,520	£10,389,717	£15,713,914	£21,038,111	£26,362,308
	6%	-£32,255,595	-£26,931,398	-£21,607,201	-£16,283,004	-£10,958,807	-£5,634,610	-£310,413	£5,013,784	£10,337,982	£15,662,179	£20,986,376
	7%	-£37,631,528	-£32,307,331	-£26,983,134	-£21,658,937	-£16,334,740	-£11,010,542	-£5,686,345	-£362,148	£4,962,049	£10,286,246	£15,610,443
	8%	-£43,007,461	-£37,683,263	-£32,359,066	-£27,034,869	-£21,710,672	-£16,386,475	-£11,062,278	-£5,738,081	-£413,884	£4,910,314	£10,234,511
	9%	-£48,383,393	-£43,059,196	-£37,734,999	-£32,410,802	-£27,086,605	-£21,762,408	-£16,438,210	-£11,114,013	-£5,789,816	-£465,619	£4,858,578
	10%	-£53,759,326	-£48,435,129	-£43,110,932	-£37,786,734	-£32,462,537	-£27,138,340	-£21,814,143	-£16,489,946	-£11,165,749	-£5,841,552	-£517,354

Figure 3.19: Incremental total cost varying the effectiveness and cost of the intervention (Asthma – extreme risk): 50% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£15,940,782	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,549,465	£7,098,930	£10,648,394	£14,197,859	£17,747,324	£21,296,789	£24,846,253	£28,395,718	£31,945,183	£35,494,648
	1%	-£4,607,942	-£1,058,477	£2,490,987	£6,040,452	£9,589,917	£13,139,382	£16,688,846	£20,238,311	£23,787,776	£27,337,241	£30,886,705
	2%	-£9,215,884	-£5,666,420	-£2,116,955	£1,432,510	£4,981,975	£8,531,439	£12,080,904	£15,630,369	£19,179,834	£22,729,298	£26,278,763
	3%	-£13,823,827	-£10,274,362	-£6,724,897	-£3,175,432	£374,032	£3,923,497	£7,472,962	£11,022,427	£14,571,891	£18,121,356	£21,670,821
	4%	-£18,431,769	-£14,882,304	-£11,332,839	-£7,783,375	-£4,233,910	-£684,445	£2,865,020	£6,414,484	£9,963,949	£13,513,414	£17,062,879
	5%	-£23,039,711	-£19,490,246	-£15,940,782	-£12,391,317	-£8,841,852	-£5,292,387	-£1,742,923	£1,806,542	£5,356,007	£8,905,472	£12,454,937
	6%	-£27,647,653	-£24,098,189	-£20,548,724	-£16,999,259	-£13,449,794	-£9,900,329	-£6,350,865	-£2,801,400	£748,065	£4,297,530	£7,846,994
	7%	-£32,255,595	-£28,706,131	-£25,156,666	-£21,607,201	-£18,057,736	-£14,508,272	-£10,958,807	-£7,409,342	-£3,859,877	-£310,413	£3,239,052
	8%	-£36,863,538	-£33,314,073	-£29,764,608	-£26,215,143	-£22,665,679	-£19,116,214	-£15,566,749	-£12,017,284	-£8,467,820	-£4,918,355	-£1,368,890
	9%	-£41,471,480	-£37,922,015	-£34,372,550	-£30,823,086	-£27,273,621	-£23,724,156	-£20,174,691	-£16,625,227	-£13,075,762	-£9,526,297	-£5,976,832
	10%	-£46,079,422	-£42,529,957	-£38,980,493	-£35,431,028	-£31,881,563	-£28,332,098	-£24,782,634	-£21,233,169	-£17,683,704	-£14,134,239	-£10,584,775

Section 4: Discussion

4.1 OVERALL

The model is predicated on a high level of assumption around a number of key variables. This notwithstanding the results show that, with the base case inputs (as listed in Section 3.2), the key drivers of the cost difference (and, by proxy, cost-effectiveness) are the excess risk profile of dwellings and upfront cost and effectiveness of the intervention. At a given efficacy the cost of an intervention can be higher, as the risk profile of a dwelling increased before it is no longer cost-saving to the NHS. However, the relative reduction in the number of symptomatic health conditions due to the implementation of an intervention is an assumption. Therefore, this is an important data gap in the model.

Regardless of the dwelling building characteristic, the cost of an intervention can be higher and still be cost saving for a dwelling with a high risk profile compared with one with a low risk profile for a given level of efficacy. For example, for a given efficacy of 5%, an intervention must not be greater than £50 in order to be cost-saving in a 'non decent' dwelling with a low risk profile (Figure 3.10). However, the intervention cost can cost up to £150 per 'non-decent' dwelling with a high-risk profile (Figure 3.14) and still be cost saving.

Due to a lack of data availability, the baseline prevalence of each symptomatic health condition was independent of the risk profile of dwellings with the baseline prevalence assumed to be equal across all risk profiles. The cost savings per person associated with the elimination of health care symptoms are, therefore, equal regardless of their risk profile. As stated in Section 2.2.4, it was expected that the majority of dwellings would have a minimal excess risk profile whilst a very low number of dwellings would have a very high excess risk profile. Therefore, although there is greater capacity for people at high risk to benefit from interventions that reduce exposure to indoor air pollution within homes, greater total cost savings accrue for those at low risk due to a higher number of people benefiting from the intervention.

The method of presenting model results using a 'what-if?' sensitivity analysis was deemed to be the most appropriate based on the data that were available. This approach has some limitations which include no definitive answer being given as to whether a specific intervention is cost saving. However, the inputs in the model are intended as a starting point for discussion and to give a general overview of the direction of results.

Carrying out the evaluation as a sensitivity analysis allows the model results to be relevant to a larger group of stakeholders. The model is designed as an interactive 'calculator' which is intended to be used flexibly so that it can be tailored to a particular dwelling with a specific risk profile and to a specific intervention. The risk profile of a dwelling should be used by decision makers to determine the type of intervention that would be most applicable to the particular dwelling. For example, for dwellings with a very high physical risk factor but low excess risk factor (e.g. a young adult with no comorbidities living in a home with damp), an intervention that would improve the structural properties of the home would be more appropriate than an intervention to fund heating for example.

Due to the nature of the literature, it was not possible to explicitly model the link between indoor air quality and health outcomes. However, this has been implicitly captured through the relationship between the increased likelihood of exposure to indoor air pollution through the risk profile of each dwelling and the health outcomes included in the model.

It is likely that many inhabitants with exposure to indoor air pollution will have more than one symptomatic health condition simultaneously. It would be expected that, if a person had comorbidities, an intervention might impact several health conditions rather than one alone, depending on the pollutants and type of other co-morbidities. However, the model does not include the functionality to account for these comorbidities as it was not possible to estimate the comorbidity status of each inhabitant in the population. Therefore, the economic model may underestimate the true level of cost savings to the NHS.

For the purpose of the economic analysis, it was assumed that the physical risk factors associated with dwellings are mutually exclusive due to a lack of data availability regarding the likelihood of a dwelling having an additional physical risk profiles. However, this assumption is considered unrealistic. It seems unlikely that a dwelling considered 'non-decent' would not have 'any damp problems' or a usable floor area greater than <90m^2. Due to the level of complexity required, the economic model also cannot estimate the cost-effectiveness of multiple interventions applied within a dwelling simultaneously. An intervention may reduce the risk associated with more than one physical risk factor. Therefore, the economic model may further underestimate the true level of cost savings to the NHS.

Due to the complexity of modelling that would be required, it was assumed that inhabitants do not move dwellings throughout the five year time horizon of the model. However, research has suggested that renting families move often [25]. If inhabitants move out of a home that has a non-transferable intervention, for example a ventilation system that would be too costly to remove, they will no longer benefit from a reduction in indoor air pollution and the cost savings to the NHS within the model may be overestimated. It was also assumed that, with the exception of the intervention, no other improvements would be made to the home to reduce exposure to indoor air pollution, nor any changes to building regulations made. If improvements had been made the baseline prevalence of symptomatic conditions would be lower and the health improvements due to the intervention overestimated in the model.

The model only estimates the potential cost savings of interventions to reduce exposure to indoor air pollution at home from the perspective of the NHS. The inclusion of any non-NHS benefits from other perspectives, both financially and non-financially, would have only improved the cost-effectiveness of interventions and should be considered qualitatively. An example of this may include increased productivity due to a reduction in time taken off work due to a reduction in health conditions resulting from poor indoor air quality.

Due to the large amount of assumptions in the model, it was not possible to apply sensitivity analysis to all parameters. To overcome this, the parameters that were expected to be the biggest drivers of the results have been varied within sensitivity analysis. It is worth noting that although the prevalence of each health condition has not been explicitly varied within a sensitivity analysis, this has been implicitly captured through the differing levels of excess risk profile (as aforementioned in Section 2.2.4). It has been assumed that a high proportion of dwellings have a low risk profile, whilst a small percentage have a very high risk.

4.2 ILLUSTRATIVE EXAMPLE

As aforementioned, it must be emphasised that the model is predicated on a high level of assumption around a key number of variables. It has been assumed that the 64% reduction in use of urgent health services reported in Krieger *et al*., (2005) [1] is equivalent to a 64% relative reduction in health condition associated symptoms within the asthmatic population. In reality, it cannot be assumed that the reduction in urgent health services is solely due to the intervention and, therefore, it is likely that this will overestimate the benefits of the intervention. Due to issues of generalisability, and for simplicity, the provision of additional materials following an environmental assessment has not been costed for within this analysis. Therefore, it is likely that the cost of the intervention has been underestimated. Furthermore, there is limited generalisability between the US paediatric population with uncontrolled asthma used within Krieger *et al*., (2005) [1], and the UK asthma population used within the model. The housing stock is also likely to be markedly different between the US and the UK, for example, due to differences in climate, materials used and regulatory processes. In addition, as routine medical practice for the treatment of asthma has changed substantively since the Krieger *et al*., (2005) [1] study was conducted, the baseline rate of asthma and subsequent relative efficacy of the intervention is likely to be lower in the current healthcare setting. Additionally, this study was focussed upon an environmental assessment conducted by a US community health worker. Because this role does not have a UK equivalent, the unit costs of the professionals included within this analysis will not accurately reflect the US study. The average wage for a community health worker within the United States is $15.72 per hour [26]. This is approximately £11.50. So, it is likely that the cost of the intervention in the United States would be cheaper than in the United Kingdom. Therefore, the results presented in Section 3.1 should be interpreted with caution.

This notwithstanding, the results show that at seven visits annually, the high intensity intervention is unlikely to be cost-saving assuming a relative reduction of overall health condition associated symptoms of 1%. As the willingness to pay for an estimated health improvement is unknown, the cost of the deliverer of the intervention is a key driver of whether the intervention should be implemented. For example, assuming a 1% intervention efficacy with six annual visits, the total incremental costs associated with an environmental care worker, home care worker, and support and outreach worker across the entire non-decent housing stock varies from £5,259,453, to £18,392,589 and £14,985,103. Whilst not changing the direction of incremental total cost, the physical risk characteristics of dwellings also have an impact on results. For example, assuming a 1% intervention efficacy with six annual visits from an environmental care worker, the incremental costs associated with a non-decent home, usable floor area <90m^2 and damp problems varies from £5,259,453 to £7,911,954 and £1,101,269 respectively.

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Appendix A: Non-Decent Homes

Costs

Table A.1 and Table A.2 show that, with the current inputs, an intervention would be cost-saving on a national level because the increased cost of an intervention is outweighed by the health condition related cost-savings.

Table A.1: Intervention cost (total population): by tenure

Tenure	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Owner	£0	£145,870,268	£145,870,268	£0	£8,752,216	£8,752,216
Private rented	£0	£65,193,548	£65,193,548	£0	£3,911,613	£3,911,613
Local authority	£0	£10,167,061	£10,167,061	£0	£610,024	£610,024
Housing association	£0	£15,400,107	£15,400,107	£0	£924,006	£924,006
Total	**£0**	**£236,630,984**	**£236,630,984**	**£0**	**£14,197,859**	**£14,197,859**

Table A.2: Health condition costs (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	£2,370,340,643	£2,133,306,578	-£237,034,064	£460,794,221	£414,714,799	-£46,079,422
COPD	£1,098,247,157	£988,422,441	-£109,824,716	£213,499,247	£192,149,323	-£21,349,925
Allergic rhinitis	£1,481,337,056	£1,333,203,350	-£148,133,706	£287,971,924	£259,174,731	-£28,797,195
Generalised anxiety disorder	£1,592,448,284	£1,433,203,456	-£159,244,828	£309,571,947	£278,614,752	-£30,957,195
Total	**£6,542,373,140**	**£5,888,135,826**	**-£654,237,314**	**£1,271,837,338**	**£1,144,653,605**	**-£127,183,734**

Health condition related QALY losses

Disutilities were incorporated into the economic model following a request from committee for a QALY based outcome measure. As described in Section 1, it was not appropriate for ICER's to be reported as an outcome measure, and therefore, reduction in QALY loss following the implantation of each intervention are reported as a standalone outcome.

Table A.3 shows that with the current inputs an intervention would lead to a reduction in QALY losses and, therefore, an increased health-related quality of life over the whole population. For example, pre-intervention approximately 56,701 QALY losses are caused by cases of symptomatic asthma across the inhabitants of dwellings with the extreme risk profile (consisting of both physical and excess risk). Following the implementation of the intervention there are fewer cases of symptomatic asthma and the QALY loss reduces by 5,670 QALYs. A larger reduction in QALY loss reflects a greater improvement in health.

Table A.3: Health condition-related QALY losses (total population)

Health condition	Low risk		Extreme risk			
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	291,673	262,506	29,167	56,701	51,031	5,670
COPD	178,091	160,282	17,809	34,621	31,159	3,462
Allergic rhinitis	115,555	104,000	11,556	22,464	20,218	2,246
GAD	307,940	277,146	30,794	59,864	53,877	5,986
Total	**893,259**	**803,933**	**89,326**	**173,650**	**156,285**	**17,365**

Number of cases

Table A.4 shows that with the current inputs an intervention would lead to a reduction in the number of symptomatic cases associated with each health condition, across dwellings with the selected excess risk profile, for both low and extreme risk dwellings.

Table A.4: Number of symptomatic cases (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	754,298	678,868	-75,430	146,636	131,972	-14,664
COPD	170,079	153,071	-17,008	33,063	29,757	-3,306
Allergic rhinitis	850,393	765,353	-85,039	165,316	148,785	-16,532
Generalised anxiety disorder	374,173	336,755	-37,417	72,739	65,465	-7,274
Total	2,148,942	1,934,048	-214,894	417,754	375,979	-41,775

Incremental cost per case avoided

Table A.5 presents the incremental cost per symptomatic case avoided. It must be noted that the costs saved from each symptomatic health condition event have already been factored into the cost savings above (Table A.1 and Table A.2**Error! Reference source not found.**). The numbers presented within this section represent the difference in symptomatic case avoided between pre- and post-intervention, rather than the absolute cost per symptomatic case avoided.

Table A.5: Incremental cost per symptomatic case avoided (total population)

Health condition	Low risk	Extreme risk
Asthma	£5	£2,174
COPD	£7,456	£2,163
Allergic rhinitis	£1,041	£883
Generalised anxiety disorder	£2,068	£2,304

Although costs and QALYs have been presented within Table A.1 and Table A.3 respectively, presenting incremental cost-effectiveness ratios was not considered appropriate for the current economic analysis. A QALY based ICER would not have any meaning in terms of representing opportunity costs because the opportunity cost within the housing sector would include spending on areas outside healthcare.

Number of events avoided

Table A.6 shows that, with the current inputs, an intervention would lead to a reduction in the number of clinical events associated with each health condition for both low and extreme risk dwellings.

Table A.6: Number of events avoided (total population)

Health condition	Event	Low risk				Extreme risk			
		Pre-intervention	Post-intervention	Incremental	Cost per event avoided	Pre-intervention	Post-intervention	Incremental	Cost per event avoided
Asthma	Moderate exacerbation	75,430	67,887	-7,543	£53	14,664	13,197	-1,466	£21,742
	Severe exacerbation	7,543	6,789	-754	£534	1,466	1,320	-147	£217,420
	Outpatient visit	4,839,829	4,355,846	-483,983	£1	940,863	846,777	-94,086	£339
	Home visit	209,125	188,213	-20,913	£19	40,654	36,589	-4,065	£7,842
	Hospitalisation	1,263	1,136	-126	£3,192	245	221	-25	£1,298,808
COPD	Non-severe exacerbation	110,617	99,555	-11,062	£11,464	21,504	19,354	-2,150	£3,326
	Severe	23,761	21,385	-2,376	£53,368	4,619	4,157	-462	£15,484
	Primary health professional visit	421,568	379,411	-42,157	£3,008	81,953	73,758	-8,195	£873
	Secondary health professional visit	65,933	59,340	-6,593	£19,232	12,817	11,536	-1,282	£5,580
Allergic rhinitis	Physician visit	2,040,942	1,836,848	-204,094	£434	396,759	357,083	-39,676	£368
	Extra GP specialist visit	108,000	97,200	-10,800	£8,194	20,995	18,896	-2,100	£6,954
	Acute ward visit	13,606	12,246	-1,361	£65,041	2,645	2,381	-265	£55,195
Generalised anxiety disorder	Inpatient care (days)	335,259	301,733	-33,526	£2,308	65,174	58,657	-6,517	£2,571
	Outpatient visit	239,471	215,524	-23,947	£3,232	46,553	41,898	-4,655	£3,600
	Primary health professional visit	583,709	525,339	-58,371	£1,326	113,473	102,126	-11,347	£1,477
	Community day care session	3,367,555	3,030,799	-336,755	£230	654,653	589,187	-65,465	£256

Childhood asthma

Table A.7**Error! Reference source not found.** presents the estimated lifetime costs and utility decrement associated with paediatric asthma, with the base case inputs, pre and post-intervention. Following the implementation of the intervention there are fewer cases of children with asthma. This is estimated to result in lifetime cost savings of £1,420,666,783 across inhabitants with a low risk profile, and a reduction in QALY loss of 174,814 QALYs. A larger reduction in QALY loss reflects a greater improvement in health. Please note that this should be considered as a standalone outcome measure to prevent double counting with the costs and health condition related utility decrements reported in Table A.1 to Table A.3.

Table A.7: Lifetime costs and utility decrement associated with paediatric asthma (total population)

Lifetime asthma	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Costs	£14,206,667,832	£12,786,001,049	-£1,420,666,783	£2,761,776,227	£2,485,598,604	-£276,177,623
Utility decrement	1,748,145	1,573,330	-174,814	339,839	305,855	-33,984

Figure A.1: COPD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£126,806,268	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£59,157,746	£118,315,492	£177,473,238	£236,630,984	£295,788,730	£354,946,476	£414,104,222	£473,261,968	£532,419,714	£591,577,459
	1%	-£10,982,472	£48,175,274	£107,333,020	£166,490,766	£225,648,512	£284,806,258	£343,964,004	£403,121,750	£462,279,496	£521,437,242	£580,594,988
	2%	-£21,964,943	£37,192,803	£96,350,549	£155,508,295	£214,666,041	£273,823,787	£332,981,533	£392,139,279	£451,297,024	£510,454,770	£569,612,516
	3%	-£32,947,415	£26,210,331	£85,368,077	£144,525,823	£203,683,569	£262,841,315	£321,999,061	£381,156,807	£440,314,553	£499,472,299	£558,630,045
	4%	-£43,929,886	£15,227,860	£74,385,606	£133,543,352	£192,701,098	£251,858,843	£311,016,589	£370,174,335	£429,332,081	£488,489,827	£547,647,573
	5%	-£54,912,358	£4,245,388	£63,403,134	£122,560,880	£181,718,626	£240,876,372	£300,034,118	£359,191,864	£418,349,610	£477,507,356	£536,665,102
	6%	-£65,894,829	-£6,737,083	£52,420,662	£111,578,408	£170,736,154	£229,893,900	£289,051,646	£348,209,392	£407,367,138	£466,524,884	£525,682,630
	7%	-£76,877,301	-£17,719,555	£41,438,191	£100,595,937	£159,753,683	£218,911,429	£278,069,175	£337,226,921	£396,384,667	£455,542,413	£514,700,158
	8%	-£87,859,773	-£28,702,027	£30,455,719	£89,613,465	£148,771,211	£207,928,957	£267,086,703	£326,244,449	£385,402,195	£444,559,941	£503,717,687
	9%	-£98,842,244	-£39,684,498	£19,473,248	£78,630,994	£137,788,740	£196,946,486	£256,104,232	£315,261,978	£374,419,723	£433,577,469	£492,735,215
	10%	-£109,824,716	-£50,666,970	£8,490,776	£67,648,522	£126,806,268	£185,964,014	£245,121,760	£304,279,506	£363,437,252	£422,594,998	£481,752,744

Figure A.2: COPD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£33,150,553	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£23,663,098	£47,326,197	£70,989,295	£94,652,394	£118,315,492	£141,978,590	£165,641,689	£189,304,787	£212,967,885	£236,630,984
	1%	-£6,150,184	£17,512,914	£41,176,013	£64,839,111	£88,502,209	£112,165,308	£135,828,406	£159,491,505	£183,154,603	£206,817,701	£230,480,800
	2%	-£12,300,368	£11,362,730	£35,025,829	£58,688,927	£82,352,025	£106,015,124	£129,678,222	£153,341,320	£177,004,419	£200,667,517	£224,330,616
	3%	-£18,450,552	£5,212,546	£28,875,645	£52,538,743	£76,201,841	£99,864,940	£123,528,038	£147,191,136	£170,854,235	£194,517,333	£218,180,432
	4%	-£24,600,736	-£937,638	£22,725,460	£46,388,559	£70,051,657	£93,714,756	£117,377,854	£141,040,952	£164,704,051	£188,367,149	£212,030,247
	5%	-£30,750,920	-£7,087,822	£16,575,276	£40,238,375	£63,901,473	£87,564,572	£111,227,670	£134,890,768	£158,553,867	£182,216,965	£205,880,063
	6%	-£36,901,104	-£13,238,006	£10,425,092	£34,088,191	£57,751,289	£81,414,387	£105,077,486	£128,740,584	£152,403,683	£176,066,781	£199,729,879
	7%	-£43,051,289	-£19,388,190	£4,274,908	£27,938,007	£51,601,105	£75,264,203	£98,927,302	£122,590,400	£146,253,498	£169,916,597	£193,579,695
	8%	-£49,201,473	-£25,538,374	-£1,875,276	£21,787,823	£45,450,921	£69,114,019	£92,777,118	£116,440,216	£140,103,314	£163,766,413	£187,429,511
	9%	-£55,351,657	-£31,688,558	-£8,025,460	£15,637,638	£39,300,737	£62,963,835	£86,626,934	£110,290,032	£133,953,130	£157,616,229	£181,279,327
	10%	-£61,501,841	-£37,838,742	-£14,175,644	£9,487,454	£33,150,553	£56,813,651	£80,476,749	£104,139,848	£127,802,946	£151,466,045	£175,129,143

Figure A.3: COPD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£7,694,835	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£21,296,789	£42,593,577	£63,890,366	£85,187,154	£106,483,943	£127,780,731	£149,077,520	£170,374,308	£191,671,097	£212,967,885
	1%	-£7,749,232	£13,547,557	£34,844,345	£56,141,134	£77,437,922	£98,734,711	£120,031,499	£141,328,288	£162,625,076	£183,921,865	£205,218,653
	2%	-£15,498,464	£5,798,325	£27,095,113	£48,391,902	£69,688,690	£90,985,479	£112,282,267	£133,579,056	£154,875,844	£176,172,633	£197,469,422
	3%	-£23,247,696	-£1,950,907	£19,345,881	£40,642,670	£61,939,458	£83,236,247	£104,533,035	£125,829,824	£147,126,613	£168,423,401	£189,720,190
	4%	-£30,996,928	-£9,700,139	£11,596,649	£32,893,438	£54,190,226	£75,487,015	£96,783,803	£118,080,592	£139,377,381	£160,674,169	£181,970,958
	5%	-£38,746,160	-£17,449,371	£3,847,417	£25,144,206	£46,440,994	£67,737,783	£89,034,572	£110,331,360	£131,628,149	£152,924,937	£174,221,726
	6%	-£46,495,392	-£25,198,603	-£3,901,815	£17,394,974	£38,691,763	£59,988,551	£81,285,340	£102,582,128	£123,878,917	£145,175,705	£166,472,494
	7%	-£54,244,624	-£32,947,835	-£11,651,046	£9,645,742	£30,942,531	£52,239,319	£73,536,108	£94,832,896	£116,129,685	£137,426,473	£158,723,262
	8%	-£61,993,856	-£40,697,067	-£19,400,278	£1,896,510	£23,193,299	£44,490,087	£65,786,876	£87,083,664	£108,380,453	£129,677,241	£150,974,030
	9%	-£69,743,087	-£48,446,299	-£27,149,510	-£5,852,722	£15,444,067	£36,740,855	£58,037,644	£79,334,432	£100,631,221	£121,928,009	£143,224,798
	10%	-£77,492,319	-£56,195,531	-£34,898,742	-£13,601,954	£7,694,835	£28,991,623	£50,288,412	£71,585,200	£92,881,989	£114,178,777	£135,475,566

Figure A.4: COPD - very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£7,222,914	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£10,648,394	£21,296,789	£31,945,183	£42,593,577	£53,241,971	£63,890,366	£74,538,760	£85,187,154	£95,835,548	£106,483,943
	1%	-£4,981,649	£5,666,745	£16,315,139	£26,963,534	£37,611,928	£48,260,322	£58,908,717	£69,557,111	£80,205,505	£90,853,899	£101,502,294
	2%	-£9,963,298	£685,096	£11,333,490	£21,981,885	£32,630,279	£43,278,673	£53,927,067	£64,575,462	£75,223,856	£85,872,250	£96,520,644
	3%	-£14,944,947	-£4,296,553	£6,351,841	£17,000,236	£27,648,630	£38,297,024	£48,945,418	£59,593,813	£70,242,207	£80,890,601	£91,538,995
	4%	-£19,926,596	-£9,278,202	£1,370,192	£12,018,586	£22,666,981	£33,315,375	£43,963,769	£54,612,163	£65,260,558	£75,908,952	£86,557,346
	5%	-£24,908,246	-£14,259,851	-£3,611,457	£7,036,937	£17,685,332	£28,333,726	£38,982,120	£49,630,514	£60,278,909	£70,927,303	£81,575,697
	6%	-£29,889,895	-£19,241,500	-£8,593,106	£2,055,288	£12,703,682	£23,352,077	£34,000,471	£44,648,865	£55,297,260	£65,945,654	£76,594,048
	7%	-£34,871,544	-£24,223,149	-£13,574,755	-£2,926,361	£7,722,033	£18,370,428	£29,018,822	£39,667,216	£50,315,610	£60,964,005	£71,612,399
	8%	-£39,853,193	-£29,204,799	-£18,556,404	-£7,908,010	£2,740,384	£13,388,779	£24,037,173	£34,685,567	£45,333,961	£55,982,356	£66,630,750
	9%	-£44,834,842	-£34,186,448	-£23,538,053	-£12,889,659	-£2,241,265	£8,407,129	£19,055,524	£29,703,918	£40,352,312	£51,000,707	£61,649,101
	10%	-£49,816,491	-£39,168,097	-£28,519,702	-£17,871,308	-£7,222,914	£3,425,480	£14,073,875	£24,722,269	£35,370,663	£46,019,057	£56,667,452

Figure A.5: COPD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£7,152,066	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,549,465	£7,098,930	£10,648,394	£14,197,859	£17,747,324	£21,296,789	£24,846,253	£28,395,718	£31,945,183	£35,494,648
	1%	-£2,134,992	£1,414,472	£4,963,937	£8,513,402	£12,062,867	£15,612,331	£19,161,796	£22,711,261	£26,260,726	£29,810,190	£33,359,655
	2%	-£4,269,985	-£720,520	£2,828,945	£6,378,409	£9,927,874	£13,477,339	£17,026,804	£20,576,268	£24,125,733	£27,675,198	£31,224,663
	3%	-£6,404,977	-£2,855,513	£693,952	£4,243,417	£7,792,882	£11,342,346	£14,891,811	£18,441,276	£21,990,741	£25,540,205	£29,089,670
	4%	-£8,539,970	-£4,990,505	-£1,441,040	£2,108,424	£5,657,889	£9,207,354	£12,756,819	£16,306,283	£19,855,748	£23,405,213	£26,954,678
	5%	-£10,674,962	-£7,125,498	-£3,576,033	-£26,568	£3,522,897	£7,072,361	£10,621,826	£14,171,291	£17,720,756	£21,270,220	£24,819,685
	6%	-£12,809,955	-£9,260,490	-£5,711,025	-£2,161,561	£1,387,904	£4,937,369	£8,486,834	£12,036,298	£15,585,763	£19,135,228	£22,684,693
	7%	-£14,944,947	-£11,395,483	-£7,846,018	-£4,296,553	-£747,088	£2,802,376	£6,351,841	£9,901,306	£13,450,771	£17,000,236	£20,549,700
	8%	-£17,079,940	-£13,530,475	-£9,981,010	-£6,431,546	-£2,882,081	£667,384	£4,216,849	£7,766,314	£11,315,778	£14,865,243	£18,414,708
	9%	-£19,214,932	-£15,665,468	-£12,116,003	-£8,566,538	-£5,017,073	-£1,467,608	£2,081,856	£5,631,321	£9,180,786	£12,730,251	£16,279,715
	10%	-£21,349,925	-£17,800,460	-£14,250,995	-£10,701,530	-£7,152,066	-£3,602,601	-£53,136	£3,496,329	£7,045,793	£10,595,258	£14,144,723

Figure A.6: Allergic Rhinitis – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£88,497,278	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£59,157,746	£118,315,492	£177,473,238	£236,630,984	£295,788,730	£354,946,476	£414,104,222	£473,261,968	£532,419,714	£591,577,459
	1%	-£14,813,371	£44,344,375	£103,502,121	£162,659,867	£221,817,613	£280,975,359	£340,133,105	£399,290,851	£458,448,597	£517,606,343	£576,764,089
	2%	-£29,626,741	£29,531,005	£88,688,751	£147,846,497	£207,004,243	£266,161,989	£325,319,735	£384,477,481	£443,635,226	£502,792,972	£561,950,718
	3%	-£44,440,112	£14,717,634	£73,875,380	£133,033,126	£192,190,872	£251,348,618	£310,506,364	£369,664,110	£428,821,856	£487,979,602	£547,137,348
	4%	-£59,253,482	-£95,736	£59,062,010	£118,219,756	£177,377,502	£236,535,248	£295,692,993	£354,850,739	£414,008,485	£473,166,231	£532,323,977
	5%	-£74,066,853	-£14,909,107	£44,248,639	£103,406,385	£162,564,131	£221,721,877	£280,879,623	£340,037,369	£399,195,115	£458,352,861	£517,510,607
	6%	-£88,880,223	-£29,722,477	£29,435,269	£88,593,014	£147,750,760	£206,908,506	£266,066,252	£325,223,998	£384,381,744	£443,539,490	£502,697,236
	7%	-£103,693,594	-£44,535,848	£14,621,898	£73,779,644	£132,937,390	£192,095,136	£251,252,882	£310,410,628	£369,568,374	£428,726,120	£487,883,866
	8%	-£118,506,964	-£59,349,219	-£191,473	£58,966,273	£118,124,019	£177,281,765	£236,439,511	£295,597,257	£354,755,003	£413,912,749	£473,070,495
	9%	-£133,320,335	-£74,162,589	-£15,004,843	£44,152,903	£103,310,649	£162,468,395	£221,626,141	£280,783,887	£339,941,633	£399,099,379	£458,257,124
	10%	-£148,133,706	-£88,975,960	-£29,818,214	£29,339,532	£88,497,278	£147,655,024	£206,812,770	£265,970,516	£325,128,262	£384,286,008	£443,443,754

Figure A.7: Allergic Rhinitis – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£11,697,518	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£23,663,098	£47,326,197	£70,989,295	£94,652,394	£118,315,492	£141,978,590	£165,641,689	£189,304,787	£212,967,885	£236,630,984
	1%	-£8,295,488	£15,367,611	£39,030,709	£62,693,808	£86,356,906	£110,020,004	£133,683,103	£157,346,201	£181,009,300	£204,672,398	£228,335,496
	2%	-£16,590,975	£7,072,123	£30,735,222	£54,398,320	£78,061,418	£101,724,517	£125,387,615	£149,050,714	£172,713,812	£196,376,910	£220,040,009
	3%	-£24,886,463	-£1,223,364	£22,439,734	£46,102,833	£69,765,931	£93,429,029	£117,092,128	£140,755,226	£164,418,324	£188,081,423	£211,744,521
	4%	-£33,181,950	-£9,518,852	£14,144,247	£37,807,345	£61,470,443	£85,133,542	£108,796,640	£132,459,739	£156,122,837	£179,785,935	£203,449,034
	5%	-£41,477,438	-£17,814,339	£5,848,759	£29,511,858	£53,174,956	£76,838,054	£100,501,153	£124,164,251	£147,827,349	£171,490,448	£195,153,546
	6%	-£49,772,925	-£26,109,827	-£2,446,728	£21,216,370	£44,879,468	£68,542,567	£92,205,665	£115,868,764	£139,531,862	£163,194,960	£186,858,059
	7%	-£58,068,413	-£34,405,314	-£10,742,216	£12,920,883	£36,583,981	£60,247,079	£83,910,178	£107,573,276	£131,236,374	£154,899,473	£178,562,571
	8%	-£66,363,900	-£42,700,802	-£19,037,703	£4,625,395	£28,288,493	£51,951,592	£75,614,690	£99,277,789	£122,940,887	£146,603,985	£170,267,084
	9%	-£74,659,388	-£50,996,289	-£27,333,191	-£3,670,092	£19,993,006	£43,656,104	£67,319,203	£90,982,301	£114,645,399	£138,308,498	£161,971,596
	10%	-£82,954,875	-£59,291,777	-£35,628,678	-£11,965,580	£11,697,518	£35,360,617	£59,023,715	£82,686,814	£106,349,912	£130,013,010	£153,676,109

Figure A.8: Allergic Rhinitis – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£19,335,988	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£21,296,789	£42,593,577	£63,890,366	£85,187,154	£106,483,943	£127,780,731	£149,077,520	£170,374,308	£191,671,097	£212,967,885
	1%	-£10,452,314	£10,844,474	£32,141,263	£53,438,051	£74,734,840	£96,031,628	£117,328,417	£138,625,206	£159,921,994	£181,218,783	£202,515,571
	2%	-£20,904,629	£392,160	£21,688,949	£42,985,737	£64,282,526	£85,579,314	£106,876,103	£128,172,891	£149,469,680	£170,766,468	£192,063,257
	3%	-£31,356,943	-£10,060,154	£11,236,634	£32,533,423	£53,830,211	£75,127,000	£96,423,788	£117,720,577	£139,017,366	£160,314,154	£181,610,943
	4%	-£41,809,257	-£20,512,469	£784,320	£22,081,109	£43,377,897	£64,674,686	£85,971,474	£107,268,263	£128,565,051	£149,861,840	£171,158,628
	5%	-£52,261,571	-£30,964,783	-£9,667,994	£11,628,794	£32,925,583	£54,222,371	£75,519,160	£96,815,948	£118,112,737	£139,409,526	£160,706,314
	6%	-£62,713,886	-£41,417,097	-£20,120,309	£1,176,480	£22,473,269	£43,770,057	£65,066,846	£86,363,634	£107,660,423	£128,957,211	£150,254,000
	7%	-£73,166,200	-£51,869,411	-£30,572,623	-£9,275,834	£12,020,954	£33,317,743	£54,614,531	£75,911,320	£97,208,108	£118,504,897	£139,801,686
	8%	-£83,618,514	-£62,321,726	-£41,024,937	-£19,728,149	£1,568,640	£22,865,429	£44,162,217	£65,459,006	£86,755,794	£108,052,583	£129,349,371
	9%	-£94,070,828	-£72,774,040	-£51,477,251	-£30,180,463	-£8,883,674	£12,413,114	£33,709,903	£55,006,691	£76,303,480	£97,600,268	£118,897,057
	10%	-£104,523,143	-£83,226,354	-£61,929,566	-£40,632,777	-£19,335,988	£1,960,800	£23,257,589	£44,554,377	£65,851,166	£87,147,954	£108,444,743

Figure A.9: Allergic Rhinitis – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£24,599,872	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£10,648,394	£21,296,789	£31,945,183	£42,593,577	£53,241,971	£63,890,366	£74,538,760	£85,187,154	£95,835,548	£106,483,943
	1%	-£6,719,345	£3,929,049	£14,577,444	£25,225,838	£35,874,232	£46,522,626	£57,171,021	£67,819,415	£78,467,809	£89,116,204	£99,764,598
	2%	-£13,438,690	-£2,790,296	£7,858,099	£18,506,493	£29,154,887	£39,803,282	£50,451,676	£61,100,070	£71,748,464	£82,396,859	£93,045,253
	3%	-£20,158,035	-£9,509,640	£1,138,754	£11,787,148	£22,435,542	£33,083,937	£43,732,331	£54,380,725	£65,029,120	£75,677,514	£86,325,908
	4%	-£26,877,380	-£16,228,985	-£5,580,591	£5,067,803	£15,716,198	£26,364,592	£37,012,986	£47,661,380	£58,309,775	£68,958,169	£79,606,563
	5%	-£33,596,724	-£22,948,330	-£12,299,936	-£1,651,542	£8,996,853	£19,645,247	£30,293,641	£40,942,035	£51,590,430	£62,238,824	£72,887,218
	6%	-£40,316,069	-£29,667,675	-£19,019,281	-£8,370,887	£2,277,508	£12,925,902	£23,574,296	£34,222,691	£44,871,085	£55,519,479	£66,167,873
	7%	-£47,035,414	-£36,387,020	-£25,738,626	-£15,090,231	-£4,441,837	£6,206,557	£16,854,951	£27,503,346	£38,151,740	£48,800,134	£59,448,529
	8%	-£53,754,759	-£43,106,365	-£32,457,971	-£21,809,576	-£11,161,182	-£512,788	£10,135,607	£20,784,001	£31,432,395	£42,080,789	£52,729,184
	9%	-£60,474,104	-£49,825,710	-£39,177,315	-£28,528,921	-£17,880,527	-£7,232,133	£3,416,262	£14,064,656	£24,713,050	£35,361,444	£46,009,839
	10%	-£67,193,449	-£56,545,055	-£45,896,660	-£35,248,266	-£24,599,872	-£13,951,478	-£3,303,083	£7,345,311	£17,993,705	£28,642,100	£39,290,494

Figure A.10: Allergic Rhinitis – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£14,599,333	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,549,465	£7,098,930	£10,648,394	£14,197,859	£17,747,324	£21,296,789	£24,846,253	£28,395,718	£31,945,183	£35,494,648
	1%	-£2,879,719	£669,746	£4,219,210	£7,768,675	£11,318,140	£14,867,605	£18,417,069	£21,966,534	£25,515,999	£29,065,464	£32,614,928
	2%	-£5,759,438	-£2,209,974	£1,339,491	£4,888,956	£8,438,421	£11,987,885	£15,537,350	£19,086,815	£22,636,280	£26,185,744	£29,735,209
	3%	-£8,639,158	-£5,089,693	-£1,540,228	£2,009,237	£5,558,701	£9,108,166	£12,657,631	£16,207,096	£19,756,560	£23,306,025	£26,855,490
	4%	-£11,518,877	-£7,969,412	-£4,419,947	-£870,483	£2,678,982	£6,228,447	£9,777,912	£13,327,376	£16,876,841	£20,426,306	£23,975,771
	5%	-£14,398,596	-£10,849,131	-£7,299,667	-£3,750,202	-£200,737	£3,348,728	£6,898,192	£10,447,657	£13,997,122	£17,546,587	£21,096,051
	6%	-£17,278,315	-£13,728,851	-£10,179,386	-£6,629,921	-£3,080,456	£469,008	£4,018,473	£7,567,938	£11,117,403	£14,666,867	£18,216,332
	7%	-£20,158,035	-£16,608,570	-£13,059,105	-£9,509,640	-£5,960,176	-£2,410,711	£1,138,754	£4,688,219	£8,237,683	£11,787,148	£15,336,613
	8%	-£23,037,754	-£19,488,289	-£15,938,824	-£12,389,360	-£8,839,895	-£5,290,430	-£1,740,965	£1,808,499	£5,357,964	£8,907,429	£12,456,894
	9%	-£25,917,473	-£22,368,008	-£18,818,544	-£15,269,079	-£11,719,614	-£8,170,149	-£4,620,685	-£1,071,220	£2,478,245	£6,027,710	£9,577,174
	10%	-£28,797,192	-£25,247,728	-£21,698,263	-£18,148,798	-£14,599,333	-£11,049,869	-£7,500,404	-£3,950,939	-£401,474	£3,147,990	£6,697,455

Figure A.11: GAD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£77,386,155	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£59,157,746	£118,315,492	£177,473,238	£236,630,984	£295,788,730	£354,946,476	£414,104,222	£473,261,968	£532,419,714	£591,577,459
	1%	-£15,924,483	£43,233,263	£102,391,009	£161,548,755	£220,706,501	£279,864,247	£339,021,993	£398,179,739	£457,337,485	£516,495,231	£575,652,977
	2%	-£31,848,966	£27,308,780	£86,466,526	£145,624,272	£204,782,018	£263,939,764	£323,097,510	£382,255,256	£441,413,002	£500,570,748	£559,728,494
	3%	-£47,773,449	£11,384,297	£70,542,043	£129,699,789	£188,857,535	£248,015,281	£307,173,027	£366,330,773	£425,488,519	£484,646,265	£543,804,011
	4%	-£63,697,931	-£4,540,185	£54,617,561	£113,775,306	£172,933,052	£232,090,798	£291,248,544	£350,406,290	£409,564,036	£468,721,782	£527,879,528
	5%	-£79,622,414	-£20,464,668	£38,693,078	£97,850,824	£157,008,570	£216,166,316	£275,324,061	£334,481,807	£393,639,553	£452,797,299	£511,955,045
	6%	-£95,546,897	-£36,389,151	£22,768,595	£81,926,341	£141,084,087	£200,241,833	£259,399,579	£318,557,325	£377,715,071	£436,872,816	£496,030,562
	7%	-£111,471,380	-£52,313,634	£6,844,112	£66,001,858	£125,159,604	£184,317,350	£243,475,096	£302,632,842	£361,790,588	£420,948,334	£480,106,080
	8%	-£127,395,863	-£68,238,117	-£9,080,371	£50,077,375	£109,235,121	£168,392,867	£227,550,613	£286,708,359	£345,866,105	£405,023,851	£464,181,597
	9%	-£143,320,346	-£84,162,600	-£25,004,854	£34,152,892	£93,310,638	£152,468,384	£211,626,130	£270,783,876	£329,941,622	£389,099,368	£448,257,114
	10%	-£159,244,828	-£100,087,082	-£40,929,337	£18,228,409	£77,386,155	£136,543,901	£195,701,647	£254,859,393	£314,017,139	£373,174,885	£432,332,631

Figure A.12: GAD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£5,475,290	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£23,663,098	£47,326,197	£70,989,295	£94,652,394	£118,315,492	£141,978,590	£165,641,689	£189,304,787	£212,967,885	£236,630,984
	1%	-£8,917,710	£14,745,388	£38,408,486	£62,071,585	£85,734,683	£109,397,782	£133,060,880	£156,723,978	£180,387,077	£204,050,175	£227,713,273
	2%	-£17,835,421	£5,827,678	£29,490,776	£53,153,874	£76,816,973	£100,480,071	£124,143,169	£147,806,268	£171,469,366	£195,132,465	£218,795,563
	3%	-£26,753,131	-£3,090,033	£20,573,066	£44,236,164	£67,899,262	£91,562,361	£115,225,459	£138,888,557	£162,551,656	£186,214,754	£209,877,853
	4%	-£35,670,842	-£12,007,743	£11,655,355	£35,318,454	£58,981,552	£82,644,650	£106,307,749	£129,970,847	£153,633,945	£177,297,044	£200,960,142
	5%	-£44,588,552	-£20,925,454	£2,737,645	£26,400,743	£50,063,842	£73,726,940	£97,390,038	£121,053,137	£144,716,235	£168,379,333	£192,042,432
	6%	-£53,506,262	-£29,843,164	-£6,180,066	£17,483,033	£41,146,131	£64,809,230	£88,472,328	£112,135,426	£135,798,525	£159,461,623	£183,124,721
	7%	-£62,423,973	-£38,760,874	-£15,097,776	£8,565,322	£32,228,421	£55,891,519	£79,554,618	£103,217,716	£126,880,814	£150,543,913	£174,207,011
	8%	-£71,341,683	-£47,678,585	-£24,015,486	-£352,388	£23,310,710	£46,973,809	£70,636,907	£94,300,006	£117,963,104	£141,626,202	£165,289,301
	9%	-£80,259,394	-£56,596,295	-£32,933,197	-£9,270,098	£14,393,000	£38,056,098	£61,719,197	£85,382,295	£109,045,393	£132,708,492	£156,371,590
	10%	-£89,177,104	-£65,514,006	-£41,850,907	-£18,187,809	£5,475,290	£29,138,388	£52,801,486	£76,464,585	£100,127,683	£123,790,781	£147,453,880

Figure A.13: GAD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£27,175,997	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£21,296,789	£42,593,577	£63,890,366	£85,187,154	£106,483,943	£127,780,731	£149,077,520	£170,374,308	£191,671,097	£212,967,885
	1%	-£11,236,315	£10,060,473	£31,357,262	£52,654,051	£73,950,839	£95,247,628	£116,544,416	£137,841,205	£159,137,993	£180,434,782	£201,731,570
	2%	-£22,472,630	-£1,175,842	£20,120,947	£41,417,735	£62,714,524	£84,011,313	£105,308,101	£126,604,890	£147,901,678	£169,198,467	£190,495,255
	3%	-£33,708,945	-£12,412,157	£8,884,632	£30,181,420	£51,478,209	£72,774,997	£94,071,786	£115,368,575	£136,665,363	£157,962,152	£179,258,940
	4%	-£44,945,260	-£23,648,472	-£2,351,683	£18,945,105	£40,241,894	£61,538,682	£82,835,471	£104,132,259	£125,429,048	£146,725,836	£168,022,625
	5%	-£56,181,575	-£34,884,787	-£13,587,998	£7,708,790	£29,005,579	£50,302,367	£71,599,156	£92,895,944	£114,192,733	£135,489,521	£156,786,310
	6%	-£67,417,891	-£46,121,102	-£24,824,313	-£3,527,525	£17,769,264	£39,066,052	£60,362,841	£81,659,629	£102,956,418	£124,253,206	£145,549,995
	7%	-£78,654,206	-£57,357,417	-£36,060,629	-£14,763,840	£6,532,948	£27,829,737	£49,126,526	£70,423,314	£91,720,103	£113,016,891	£134,313,680
	8%	-£89,890,521	-£68,593,732	-£47,296,944	-£26,000,155	-£4,703,367	£16,593,422	£37,890,210	£59,186,999	£80,483,788	£101,780,576	£123,077,365
	9%	-£101,126,836	-£79,830,047	-£58,533,259	-£37,236,470	-£15,939,682	£5,357,107	£26,653,895	£47,950,684	£69,247,472	£90,544,261	£111,841,050
	10%	-£112,363,151	-£91,066,362	-£69,769,574	-£48,472,785	-£27,175,997	-£5,879,208	£15,417,580	£36,714,369	£58,011,157	£79,307,946	£100,604,734

Figure A.14: GAD – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£29,639,877	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£21,296,789	£42,593,577	£63,890,366	£85,187,154	£106,483,943	£127,780,731	£149,077,520	£170,374,308	£191,671,097	£212,967,885
	1%	-£11,236,315	£10,060,473	£31,357,262	£52,654,051	£73,950,839	£95,247,628	£116,544,416	£137,841,205	£159,137,993	£180,434,782	£201,731,570
	2%	-£22,472,630	-£1,175,842	£20,120,947	£41,417,735	£62,714,524	£84,011,313	£105,308,101	£126,604,890	£147,901,678	£169,198,467	£190,495,255
	3%	-£33,708,945	-£12,412,157	£8,884,632	£30,181,420	£51,478,209	£72,774,997	£94,071,786	£115,368,575	£136,665,363	£157,962,152	£179,258,940
	4%	-£44,945,260	-£23,648,472	-£2,351,683	£18,945,105	£40,241,894	£61,538,682	£82,835,471	£104,132,259	£125,429,048	£146,725,836	£168,022,625
	5%	-£56,181,575	-£34,884,787	-£13,587,998	£7,708,790	£29,005,579	£50,302,367	£71,599,156	£92,895,944	£114,192,733	£135,489,521	£156,786,310
	6%	-£67,417,891	-£46,121,102	-£24,824,313	-£3,527,525	£17,769,264	£39,066,052	£60,362,841	£81,659,629	£102,956,418	£124,253,206	£145,549,995
	7%	-£78,654,206	-£57,357,417	-£36,060,629	-£14,763,840	£6,532,948	£27,829,737	£49,126,526	£70,423,314	£91,720,103	£113,016,891	£134,313,680
	8%	-£89,890,521	-£68,593,732	-£47,296,944	-£26,000,155	-£4,703,367	£16,593,422	£37,890,210	£59,186,999	£80,483,788	£101,780,576	£123,077,365
	9%	-£101,126,836	-£79,830,047	-£58,533,259	-£37,236,470	-£15,939,682	£5,357,107	£26,653,895	£47,950,684	£69,247,472	£90,544,261	£111,841,050
	10%	-£112,363,151	-£91,066,362	-£69,769,574	-£48,472,785	-£27,175,997	-£5,879,208	£15,417,580	£36,714,369	£58,011,157	£79,307,946	£100,604,734

Figure A.15: GAD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£16,759,336	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£3,549,465	£7,098,930	£10,648,394	£14,197,859	£17,747,324	£21,296,789	£24,846,253	£28,395,718	£31,945,183	£35,494,648
	1%	-£3,095,719	£453,745	£4,003,210	£7,552,675	£11,102,140	£14,651,604	£18,201,069	£21,750,534	£25,299,999	£28,849,463	£32,398,928
	2%	-£6,191,439	-£2,641,974	£907,491	£4,456,955	£8,006,420	£11,555,885	£15,105,350	£18,654,814	£22,204,279	£25,753,744	£29,303,209
	3%	-£9,287,158	-£5,737,694	-£2,188,229	£1,361,236	£4,910,701	£8,460,165	£12,009,630	£15,559,095	£19,108,560	£22,658,024	£26,207,489
	4%	-£12,382,878	-£8,833,413	-£5,283,948	-£1,734,484	£1,814,981	£5,364,446	£8,913,911	£12,463,375	£16,012,840	£19,562,305	£23,111,770
	5%	-£15,478,597	-£11,929,133	-£8,379,668	-£4,830,203	-£1,280,738	£2,268,726	£5,818,191	£9,367,656	£12,917,121	£16,466,585	£20,016,050
	6%	-£18,574,317	-£15,024,852	-£11,475,387	-£7,925,923	-£4,376,458	-£826,993	£2,722,472	£6,271,937	£9,821,401	£13,370,866	£16,920,331
	7%	-£21,670,036	-£18,120,571	-£14,571,107	-£11,021,642	-£7,472,177	-£3,922,712	-£373,248	£3,176,217	£6,725,682	£10,275,147	£13,824,611
	8%	-£24,765,756	-£21,216,291	-£17,666,826	-£14,117,361	-£10,567,897	-£7,018,432	-£3,468,967	£80,498	£3,629,962	£7,179,427	£10,728,892
	9%	-£27,861,475	-£24,312,010	-£20,762,546	-£17,213,081	-£13,663,616	-£10,114,151	-£6,564,687	-£3,015,222	£534,243	£4,083,708	£7,633,172
	10%	-£30,957,195	-£27,407,730	-£23,858,265	-£20,308,800	-£16,759,336	-£13,209,871	-£9,660,406	-£6,110,941	-£2,561,477	£987,988	£4,537,453

Appendix B: Usable Floor Area <90m^2

Costs

Table B.1: Intervention cost (total population): by tenure

Tenure	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Owner	£0	£172,896,993	£172,896,993	£0	£10,373,820	£10,373,720
Private rented	£0	£92,195,354	£92,195,354	£0	£5,531,721	£5,531,721
Local authority	£0	£36,795,077	£36,795,077	£0	£2,207,705	£2,207,705
Housing association	£0	£54,084,709	£54,084,709	£0	£3,245,023	£3,245,023
Total	**£0**	**£355,971,132**	**£355,971,132**	**£0**	**£21,358,268**	**£21,358,268**

Table B.2: Health condition costs (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	£7,131,549,967	£6,774,972,468	-£356,577,498	£1,386,373,314	£1,317,054,648	-£69,318,666
COPD	£3,304,252,703	£3,139,040,068	-£165,212,635	£642,346,725	£610,229,389	-£32,117,336
Allergic rhinitis	£4,456,840,102	£4,233,998,097	-£222,842,005	£866,409,716	£823,089,230	-£43,320,486
Generalised anxiety disorder	£4,791,136,053	£4,551,579,250	-£239,556,803	£931,396,849	£884,827,006	-£46,569,842
Total	**£19,683,778,824**	**£18,699,589,883**	**-£984,118,941**	**£3,826,526,603**	**£3,635,200,273**	**-£191,326,330**

Health condition related QALY losses

Table B.3: Health condition related QALY losses (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	877,544	833,667	43,877	170,595	162,065	8,530
COPD	535,816	509,025	26,791	104,163	98,954	5,208
Allergic rhinitis	347,666	330,283	17,383	67,586	64,207	3,379
Generalised anxiety disorder	926,487	880,163	46,324	180,109	171,104	9,005
Total	**2,687,513**	**2,553,137**	**134,376**	**522,453**	**496,330**	**26,123**

Number of cases

Table B.4: Number of symptomatic cases (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	2,269,427	2,155,956	-113,471	441,177	419,118	-22,059
COPD	511,709	486,123	-25,585	99,476	94,502	-4,974
Allergic rhinitis	2,558,543	2,430,615	-127,927	497,381	472,512	-24,869
Generalised anxiety disorder	1,125,759	1,069,471	-56,288	218,847	207,905	-10,942
Total	**6,465,437**	**6,142,165**	**-323,272**	**1,256,881**	**1,194,037**	**-62,844**

Incremental cost per case avoided

Table B.5: Incremental cost per symptomatic case avoided (total population)

Health condition	Low risk	Extreme risk
Asthma	£5	£2,174
COPD	£7,456	£2,163
Allergic rhinitis	£1,041	£883
Generalised anxiety disorder	£2,068	£2,304

Number of events avoided

Table B.6: Number of events avoided (total population)

Health condition	Event	Low risk				Extreme risk			
		Pre-intervention	Post-intervention	Incremental	Cost per event avoided	Pre-intervention	Post-intervention	Incremental	Cost per event avoided
Asthma	Moderate exacerbation	226,943	215,596	-11,347	£53	44,118	41,912	-2,206	£21,742
	Severe exacerbation	22,694	21,560	-1,135	£534	4,412	4,191	-221	£217,420
	Outpatient visit	14,561,403	13,833,333	-728,070	£1	2,830,737	2,689,200	-141,537	£339
	Home visit	629,186	597,727	-31,459	£19	122,314	116,198	-6,116	£7,842
	Hospitalisation	3,799	3,609	-190	£3,192	739	702	-37	£1,298,808
COPD	Non-severe exacerbation	332,809	316,169	-16,640	£11,464	64,698	61,463	-3,235	£3,326
	Severe	71,488	67,913	-3,574	£53,368	13,897	13,202	-695	£15,484
	Primary health professional visit	1,268,354	1,204,937	-63,418	£3,008	246,568	234,240	-12,328	£873
	Secondary health professional visit	198,371	188,453	-9,919	£19,232	38,563	36,635	-1,928	£5,580
Allergic rhinitis	Physician visit	6,140,502	5,833,477	-307,025	£434	1,193,714	1,134,028	-59,686	£368
	Extra GP specialist visit	324,935	308,688	-16,247	£8,194	63,167	60,009	-3,158	£6,954
	Acute ward visit	40,937	38,890	-2,047	£65,041	7,958	7,560	-398	£55,195
Generalised anxiety disorder	Inpatient care (days)	1,008,680	958,246	-50,434	£2,308	196,087	186,283	-9,804	£2,571
	Outpatient visit	720,486	684,461	-36,024	£3,232	140,062	133,059	-7,003	£3,600
	Primary health professional visit	1,756,184	1,668,374	-87,809	£1,326	341,402	324,332	-17,070	£1,477
	Community day care session	10,131,828	9,625,237	-506,591	£230	1,969,627	1,871,146	-98,481	£256

Childhood asthma

Table B.7: Lifetime costs and utility decrement associated with paediatric asthma (total population)

Lifetime asthma	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Costs	£42,743,038,567	£40,605,886,638	-£2,137,151,928	£8,309,246,697	£7,893,784,362	-£415,462,335
Utility decrement	5,259,575	4,996,596	-262,979	1,022,461	971,338	-51,123

Figure B.1: Asthma – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£606,366	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£88,992,783	£177,985,566	£266,978,349	£355,971,132	£444,963,915	£533,956,698	£622,949,481	£711,942,264	£800,935,047	£889,927,831
	1%	-£35,657,750	£53,335,033	£142,327,816	£231,320,599	£320,313,382	£409,306,165	£498,298,948	£587,291,732	£676,284,515	£765,277,298	£854,270,081
	2%	-£71,315,500	£17,677,283	£106,670,066	£195,662,849	£284,655,633	£373,648,416	£462,641,199	£551,633,982	£640,626,765	£729,619,548	£818,612,331
	3%	-£106,973,250	-£17,980,466	£71,012,317	£160,005,100	£248,997,883	£337,990,666	£426,983,449	£515,976,232	£604,969,015	£693,961,798	£782,954,581
	4%	-£142,630,999	-£53,638,216	£35,354,567	£124,347,350	£213,340,133	£302,332,916	£391,325,699	£480,318,482	£569,311,265	£658,304,048	£747,296,831
	5%	-£178,288,749	-£89,295,966	-£303,183	£88,689,600	£177,682,383	£266,675,166	£355,667,949	£444,660,732	£533,653,515	£622,646,298	£711,639,081
	6%	-£213,946,499	-£124,953,716	-£35,960,933	£53,031,850	£142,024,633	£231,017,416	£320,010,199	£409,002,982	£497,995,765	£586,988,548	£675,981,332
	7%	-£249,604,249	-£160,611,466	-£71,618,683	£17,374,100	£106,366,883	£195,359,666	£284,352,449	£373,345,233	£462,338,016	£551,330,799	£640,323,582
	8%	-£285,261,999	-£196,269,216	-£107,276,433	-£18,283,650	£70,709,134	£159,701,917	£248,694,700	£337,687,483	£426,680,266	£515,673,049	£604,665,832
	9%	-£320,919,749	-£231,926,965	-£142,934,182	-£53,941,399	£35,051,384	£124,044,167	£213,036,950	£302,029,733	£391,022,516	£480,015,299	£569,008,082
	10%	-£356,577,498	-£267,584,715	-£178,591,932	-£89,599,149	-£606,366	£88,386,417	£177,379,200	£266,371,983	£355,364,766	£444,357,549	£533,350,332

Figure B.2: Asthma – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£57,294,946	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£35,597,113	£71,194,226	£106,791,340	£142,388,453	£177,985,566	£213,582,679	£249,179,793	£284,776,906	£320,374,019	£355,971,132
	1%	-£19,968,340	£15,628,773	£51,225,887	£86,823,000	£122,420,113	£158,017,226	£193,614,339	£229,211,453	£264,808,566	£300,405,679	£336,002,792
	2%	-£39,936,680	-£4,339,567	£31,257,547	£66,854,660	£102,451,773	£138,048,886	£173,646,000	£209,243,113	£244,840,226	£280,437,339	£316,034,452
	3%	-£59,905,020	-£24,307,907	£11,289,207	£46,886,320	£82,483,433	£118,080,546	£153,677,660	£189,274,773	£224,871,886	£260,468,999	£296,066,112
	4%	-£79,873,360	-£44,276,246	-£8,679,133	£26,917,980	£62,515,093	£98,112,206	£133,709,320	£169,306,433	£204,903,546	£240,500,659	£276,097,773
	5%	-£99,841,700	-£64,244,586	-£28,647,473	£6,949,640	£42,546,753	£78,143,867	£113,740,980	£149,338,093	£184,935,206	£220,532,319	£256,129,433
	6%	-£119,810,039	-£84,212,926	-£48,615,813	-£13,018,700	£22,578,413	£58,175,527	£93,772,640	£129,369,753	£164,966,866	£200,563,980	£236,161,093
	7%	-£139,778,379	-£104,181,266	-£68,584,153	-£32,987,040	£2,610,074	£38,207,187	£73,804,300	£109,401,413	£144,998,526	£180,595,640	£216,192,753
	8%	-£159,746,719	-£124,149,606	-£88,552,493	-£52,955,380	-£17,358,266	£18,238,847	£53,835,960	£89,433,073	£125,030,187	£160,627,300	£196,224,413
	9%	-£179,715,059	-£144,117,946	-£108,520,833	-£72,923,720	-£37,326,606	-£1,729,493	£33,867,620	£69,464,733	£105,061,847	£140,658,960	£176,256,073
	10%	-£199,683,399	-£164,086,286	-£128,489,173	-£92,892,059	-£57,294,946	-£21,697,833	£13,899,280	£49,496,393	£85,093,507	£120,690,620	£156,287,733

Figure B.3: Asthma – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£123,451,475	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£32,037,402	£64,074,804	£96,112,206	£128,149,608	£160,187,009	£192,224,411	£224,261,813	£256,299,215	£288,336,617	£320,374,019
	1%	-£25,160,108	£6,877,294	£38,914,696	£70,952,097	£102,989,499	£135,026,901	£167,064,303	£199,101,705	£231,139,107	£263,176,509	£295,213,911
	2%	-£50,320,217	-£18,282,815	£13,754,587	£45,791,989	£77,829,391	£109,866,793	£141,904,195	£173,941,597	£205,978,999	£238,016,401	£270,053,802
	3%	-£75,480,325	-£43,442,923	-£11,405,521	£20,631,881	£52,669,283	£84,706,685	£116,744,087	£148,781,488	£180,818,890	£212,856,292	£244,893,694
	4%	-£100,640,433	-£68,603,031	-£36,565,629	-£4,528,227	£27,509,174	£59,546,576	£91,583,978	£123,621,380	£155,658,782	£187,696,184	£219,733,586
	5%	-£125,800,541	-£93,763,140	-£61,725,738	-£29,688,336	£2,349,066	£34,386,468	£66,423,870	£98,461,272	£130,498,674	£162,536,076	£194,573,478
	6%	-£150,960,650	-£118,923,248	-£86,885,846	-£54,848,444	-£22,811,042	£9,226,360	£41,263,762	£73,301,164	£105,338,565	£137,375,967	£169,413,369
	7%	-£176,120,758	-£144,083,356	-£112,045,954	-£80,008,552	-£47,971,150	-£15,933,748	£16,103,653	£48,141,055	£80,178,457	£112,215,859	£144,253,261
	8%	-£201,280,866	-£169,243,464	-£137,206,062	-£105,168,661	-£73,131,259	-£41,093,857	-£9,056,455	£22,980,947	£55,018,349	£87,055,751	£119,093,153
	9%	-£226,440,975	-£194,403,573	-£162,366,171	-£130,328,769	-£98,291,367	-£66,253,965	-£34,216,563	-£2,179,161	£29,858,241	£61,895,643	£93,933,044
	10%	-£251,601,083	-£219,563,681	-£187,526,279	-£155,488,877	-£123,451,475	-£91,414,073	-£59,376,671	-£27,339,270	£4,698,132	£36,735,534	£68,772,936

Figure B.4: Asthma – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£97,668,749	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£16,018,701	£32,037,402	£48,056,103	£64,074,804	£80,093,505	£96,112,206	£112,130,907	£128,149,608	£144,168,309	£160,187,009
	1%	-£16,174,355	-£155,654	£15,863,047	£31,881,748	£47,900,448	£63,919,149	£79,937,850	£95,956,551	£111,975,252	£127,993,953	£144,012,654
	2%	-£32,348,711	-£16,330,010	-£311,309	£15,707,392	£31,726,093	£47,744,794	£63,763,495	£79,782,196	£95,800,897	£111,819,598	£127,838,299
	3%	-£48,523,066	-£32,504,365	-£16,485,664	-£466,963	£15,551,738	£31,570,439	£47,589,140	£63,607,841	£79,626,542	£95,645,243	£111,663,944
	4%	-£64,697,421	-£48,678,720	-£32,660,019	-£16,641,318	-£622,618	£15,396,083	£31,414,784	£47,433,485	£63,452,186	£79,470,887	£95,489,588
	5%	-£80,871,777	-£64,853,076	-£48,834,375	-£32,815,674	-£16,796,973	-£778,272	£15,240,429	£31,259,130	£47,277,831	£63,296,532	£79,315,233
	6%	-£97,046,132	-£81,027,431	-£65,008,730	-£48,990,029	-£32,971,328	-£16,952,627	-£933,926	£15,084,775	£31,103,476	£47,122,177	£63,140,878
	7%	-£113,220,487	-£97,201,786	-£81,183,085	-£65,164,384	-£49,145,683	-£33,126,983	-£17,108,282	-£1,089,581	£14,929,120	£30,947,821	£46,966,522
	8%	-£129,394,843	-£113,376,142	-£97,357,441	-£81,338,740	-£65,320,039	-£49,301,338	-£33,282,637	-£17,263,936	-£1,245,235	£14,773,466	£30,792,167
	9%	-£145,569,198	-£129,550,497	-£113,531,796	-£97,513,095	-£81,494,394	-£65,475,693	-£49,456,992	-£33,438,291	-£17,419,590	-£1,400,889	£14,617,812
	10%	-£161,743,553	-£145,724,852	-£129,706,151	-£113,687,450	-£97,668,749	-£81,650,049	-£65,631,348	-£49,612,647	-£33,593,946	-£17,575,245	-£1,556,544

Figure B.5: Asthma – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£47,960,398	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£5,339,567	£10,679,134	£16,018,701	£21,358,268	£26,697,835	£32,037,402	£37,376,969	£42,716,536	£48,056,103	£53,395,670
	1%	-£6,931,867	-£1,592,300	£3,747,267	£9,086,834	£14,426,401	£19,765,968	£25,105,535	£30,445,102	£35,784,669	£41,124,236	£46,463,803
	2%	-£13,863,733	-£8,524,166	-£3,184,599	£2,154,968	£7,494,535	£12,834,102	£18,173,669	£23,513,236	£28,852,803	£34,192,370	£39,531,937
	3%	-£20,795,600	-£15,456,033	-£10,116,466	-£4,776,899	£562,668	£5,902,235	£11,241,802	£16,581,369	£21,920,936	£27,260,503	£32,600,070
	4%	-£27,727,466	-£22,387,899	-£17,048,332	-£11,708,765	-£6,369,198	-£1,029,631	£4,309,936	£9,649,503	£14,989,070	£20,328,637	£25,668,204
	5%	-£34,659,333	-£29,319,766	-£23,980,199	-£18,640,632	-£13,301,065	-£7,961,498	-£2,621,931	£2,717,636	£8,057,203	£13,396,770	£18,736,337
	6%	-£41,591,199	-£36,251,632	-£30,912,065	-£25,572,498	-£20,232,931	-£14,893,364	-£9,553,798	-£4,214,231	£1,125,336	£6,464,903	£11,804,470
	7%	-£48,523,066	-£43,183,499	-£37,843,932	-£32,504,365	-£27,164,798	-£21,825,231	-£16,485,664	-£11,146,097	-£5,806,530	-£466,963	£4,872,604
	8%	-£55,454,933	-£50,115,366	-£44,775,799	-£39,436,232	-£34,096,665	-£28,757,098	-£23,417,531	-£18,077,964	-£12,738,397	-£7,398,830	-£2,059,263
	9%	-£62,386,799	-£57,047,232	-£51,707,665	-£46,368,098	-£41,028,531	-£35,688,964	-£30,349,397	-£25,009,830	-£19,670,263	-£14,330,696	-£8,991,129
	10%	-£69,318,666	-£63,979,099	-£58,639,532	-£53,299,965	-£47,960,398	-£42,620,831	-£37,281,264	-£31,941,697	-£26,602,130	-£21,262,563	-£15,922,996

Figure B.6: COPD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£190,758,497	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£88,992,783	£177,985,566	£266,978,349	£355,971,132	£444,963,915	£533,956,698	£622,949,481	£711,942,264	£800,935,047	£889,927,831
	1%	-£16,521,264	£72,471,520	£161,464,303	£250,457,086	£339,449,869	£428,442,652	£517,435,435	£606,428,218	£695,421,001	£784,413,784	£873,406,567
	2%	-£33,042,527	£55,950,256	£144,943,039	£233,935,822	£322,928,605	£411,921,388	£500,914,171	£589,906,954	£678,899,737	£767,892,520	£856,885,303
	3%	-£49,563,791	£39,428,993	£128,421,776	£217,414,559	£306,407,342	£395,400,125	£484,392,908	£573,385,691	£662,378,474	£751,371,257	£840,364,040
	4%	-£66,085,054	£22,907,729	£111,900,512	£200,893,295	£289,886,078	£378,878,861	£467,871,644	£556,864,427	£645,857,210	£734,849,993	£823,842,776
	5%	-£82,606,318	£6,386,465	£95,379,249	£184,372,032	£273,364,815	£362,357,598	£451,350,381	£540,343,164	£629,335,947	£718,328,730	£807,321,513
	6%	-£99,127,581	-£10,134,798	£78,857,985	£167,850,768	£256,843,551	£345,836,334	£434,829,117	£523,821,900	£612,814,683	£701,807,466	£790,800,249
	7%	-£115,648,845	-£26,656,062	£62,336,722	£151,329,505	£240,322,288	£329,315,071	£418,307,854	£507,300,637	£596,293,420	£685,286,203	£774,278,986
	8%	-£132,170,108	-£43,177,325	£45,815,458	£134,808,241	£223,801,024	£312,793,807	£401,786,590	£490,779,373	£579,772,156	£668,764,939	£757,757,722
	9%	-£148,691,372	-£59,698,589	£29,294,194	£118,286,978	£207,279,761	£296,272,544	£385,265,327	£474,258,110	£563,250,893	£652,243,676	£741,236,459
	10%	-£165,212,635	-£76,219,852	£12,772,931	£101,765,714	£190,758,497	£279,751,280	£368,744,063	£457,736,846	£546,729,629	£635,722,412	£724,715,195

Figure B.7: COPD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£49,869,377	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£35,597,113	£71,194,226	£106,791,340	£142,388,453	£177,985,566	£213,582,679	£249,179,793	£284,776,906	£320,374,019	£355,971,132
	1%	-£9,251,908	£26,345,206	£61,942,319	£97,539,432	£133,136,545	£168,733,659	£204,330,772	£239,927,885	£275,524,998	£311,122,111	£346,719,225
	2%	-£18,503,815	£17,093,298	£52,690,411	£88,287,525	£123,884,638	£159,481,751	£195,078,864	£230,675,977	£266,273,091	£301,870,204	£337,467,317
	3%	-£27,755,723	£7,841,391	£43,438,504	£79,035,617	£114,632,730	£150,229,843	£185,826,957	£221,424,070	£257,021,183	£292,618,296	£328,215,410
	4%	-£37,007,630	-£1,410,517	£34,186,596	£69,783,709	£105,380,823	£140,977,936	£176,575,049	£212,172,162	£247,769,275	£283,366,389	£318,963,502
	5%	-£46,259,538	-£10,662,425	£24,934,689	£60,531,802	£96,128,915	£131,726,028	£167,323,141	£202,920,255	£238,517,368	£274,114,481	£309,711,594
	6%	-£55,511,445	-£19,914,332	£15,682,781	£51,279,894	£86,877,007	£122,474,121	£158,071,234	£193,668,347	£229,265,460	£264,862,574	£300,459,687
	7%	-£64,763,353	-£29,166,240	£6,430,873	£42,027,987	£77,625,100	£113,222,213	£148,819,326	£184,416,440	£220,013,553	£255,610,666	£291,207,779
	8%	-£74,015,261	-£38,418,147	-£2,821,034	£32,776,079	£68,373,192	£103,970,306	£139,567,419	£175,164,532	£210,761,645	£246,358,758	£281,955,872
	9%	-£83,267,168	-£47,670,055	-£12,072,942	£23,524,172	£59,121,285	£94,718,398	£130,315,511	£165,912,624	£201,509,738	£237,106,851	£272,703,964
	10%	-£92,519,076	-£56,921,962	-£21,324,849	£14,272,264	£49,869,377	£85,466,490	£121,063,604	£156,660,717	£192,257,830	£227,854,943	£263,452,057

Figure B.8: COPD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£11,575,572	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£32,037,402	£64,074,804	£96,112,206	£128,149,608	£160,187,009	£192,224,411	£224,261,813	£256,299,215	£288,336,617	£320,374,019
	1%	-£11,657,404	£20,379,998	£52,417,400	£84,454,802	£116,492,204	£148,529,606	£180,567,008	£212,604,410	£244,641,812	£276,679,214	£308,716,615
	2%	-£23,314,807	£8,722,595	£40,759,997	£72,797,399	£104,834,801	£136,872,202	£168,909,604	£200,947,006	£232,984,408	£265,021,810	£297,059,212
	3%	-£34,972,211	-£2,934,809	£29,102,593	£61,139,995	£93,177,397	£125,214,799	£157,252,201	£189,289,603	£221,327,005	£253,364,406	£285,401,808
	4%	-£46,629,614	-£14,592,212	£17,445,190	£49,482,592	£81,519,993	£113,557,395	£145,594,797	£177,632,199	£209,669,601	£241,707,003	£273,744,405
	5%	-£58,287,018	-£26,249,616	£5,787,786	£37,825,188	£69,862,590	£101,899,992	£133,937,394	£165,974,796	£198,012,198	£230,049,599	£262,087,001
	6%	-£69,944,421	-£37,907,019	-£5,869,617	£26,167,784	£58,205,186	£90,242,588	£122,279,990	£154,317,392	£186,354,794	£218,392,196	£250,429,598
	7%	-£81,601,825	-£49,564,423	-£17,527,021	£14,510,381	£46,547,783	£78,585,185	£110,622,587	£142,659,989	£174,697,390	£206,734,792	£238,772,194
	8%	-£93,259,228	-£61,221,826	-£29,184,424	£2,852,977	£34,890,379	£66,927,781	£98,965,183	£131,002,585	£163,039,987	£195,077,389	£227,114,791
	9%	-£104,916,632	-£72,879,230	-£40,841,828	-£8,804,426	£23,232,976	£55,270,378	£87,307,780	£119,345,181	£151,382,583	£183,419,985	£215,457,387
	10%	-£116,574,035	-£84,536,633	-£52,499,232	-£20,461,830	£11,575,572	£43,612,974	£75,650,376	£107,687,778	£139,725,180	£171,762,582	£203,799,984

Figure B.9: COPD – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£10,865,648	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£16,018,701	£32,037,402	£48,056,103	£64,074,804	£80,093,505	£96,112,206	£112,130,907	£128,149,608	£144,168,309	£160,187,009
	1%	-£7,494,045	£8,524,656	£24,543,357	£40,562,058	£56,580,759	£72,599,460	£88,618,161	£104,636,862	£120,655,562	£136,674,263	£152,692,964
	2%	-£14,988,090	£1,030,611	£17,049,312	£33,068,013	£49,086,714	£65,105,414	£81,124,115	£97,142,816	£113,161,517	£129,180,218	£145,198,919
	3%	-£22,482,135	-£6,463,434	£9,555,267	£25,573,967	£41,592,668	£57,611,369	£73,630,070	£89,648,771	£105,667,472	£121,686,173	£137,704,874
	4%	-£29,976,181	-£13,957,480	£2,061,221	£18,079,922	£34,098,623	£50,117,324	£66,136,025	£82,154,726	£98,173,427	£114,192,128	£130,210,829
	5%	-£37,470,226	-£21,451,525	-£5,432,824	£10,585,877	£26,604,578	£42,623,279	£58,641,980	£74,660,681	£90,679,382	£106,698,083	£122,716,784
	6%	-£44,964,271	-£28,945,570	-£12,926,869	£3,091,832	£19,110,533	£35,129,234	£51,147,935	£67,166,636	£83,185,337	£99,204,038	£115,222,739
	7%	-£52,458,316	-£36,439,615	-£20,420,914	-£4,402,213	£11,616,488	£27,635,189	£43,653,890	£59,672,591	£75,691,292	£91,709,993	£107,728,694
	8%	-£59,952,361	-£43,933,660	-£27,914,959	-£11,896,258	£4,122,443	£20,141,144	£36,159,845	£52,178,546	£68,197,247	£84,215,948	£100,234,648
	9%	-£67,446,406	-£51,427,705	-£35,409,004	-£19,390,303	-£3,371,602	£12,647,099	£28,665,800	£44,684,500	£60,703,201	£76,721,902	£92,740,603
	10%	-£74,940,451	-£58,921,750	-£42,903,049	-£26,884,348	-£10,865,648	£5,153,053	£21,171,754	£37,190,455	£53,209,156	£69,227,857	£85,246,558

Figure B.10: COPD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£10,759,068	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£5,339,567	£10,679,134	£16,018,701	£21,358,268	£26,697,835	£32,037,402	£37,376,969	£42,716,536	£48,056,103	£53,395,670
	1%	-£3,211,734	£2,127,833	£7,467,400	£12,806,967	£18,146,534	£23,486,101	£28,825,668	£34,165,235	£39,504,802	£44,844,369	£50,183,936
	2%	-£6,423,467	-£1,083,900	£4,255,667	£9,595,234	£14,934,801	£20,274,368	£25,613,935	£30,953,502	£36,293,069	£41,632,636	£46,972,203
	3%	-£9,635,201	-£4,295,634	£1,043,933	£6,383,500	£11,723,067	£17,062,634	£22,402,201	£27,741,768	£33,081,335	£38,420,902	£43,760,469
	4%	-£12,846,935	-£7,507,368	-£2,167,801	£3,171,766	£8,511,333	£13,850,900	£19,190,467	£24,530,034	£29,869,601	£35,209,168	£40,548,735
	5%	-£16,058,668	-£10,719,101	-£5,379,534	-£39,967	£5,299,600	£10,639,167	£15,978,734	£21,318,301	£26,657,868	£31,997,435	£37,337,002
	6%	-£19,270,402	-£13,930,835	-£8,591,268	-£3,251,701	£2,087,866	£7,427,433	£12,767,000	£18,106,567	£23,446,134	£28,785,701	£34,125,268
	7%	-£22,482,135	-£17,142,568	-£11,803,001	-£6,463,434	-£1,123,867	£4,215,700	£9,555,267	£14,894,833	£20,234,400	£25,573,967	£30,913,534
	8%	-£25,693,869	-£20,354,302	-£15,014,735	-£9,675,168	-£4,335,601	£1,003,966	£6,343,533	£11,683,100	£17,022,667	£22,362,234	£27,701,801
	9%	-£28,905,603	-£23,566,036	-£18,226,469	-£12,886,902	-£7,547,335	-£2,207,768	£3,131,799	£8,471,366	£13,810,933	£19,150,500	£24,490,067
	10%	-£32,117,336	-£26,777,769	-£21,438,202	-£16,098,635	-£10,759,068	-£5,419,501	-£79,934	£5,259,633	£10,599,200	£15,938,767	£21,278,334

Figure B.11: Allergic Rhinitis – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£133,129,127	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£88,992,783	£177,985,566	£266,978,349	£355,971,132	£444,963,915	£533,956,698	£622,949,481	£711,942,264	£800,935,047	£889,927,831
	1%	-£22,284,201	£66,708,583	£155,701,366	£244,694,149	£333,686,932	£422,679,715	£511,672,498	£600,665,281	£689,658,064	£778,650,847	£867,643,630
	2%	-£44,568,401	£44,424,382	£133,417,165	£222,409,948	£311,402,731	£400,395,514	£489,388,297	£578,381,080	£667,373,863	£756,366,646	£845,359,430
	3%	-£66,852,602	£22,140,182	£111,132,965	£200,125,748	£289,118,531	£378,111,314	£467,104,097	£556,096,880	£645,089,663	£734,082,446	£823,075,229
	4%	-£89,136,802	-£144,019	£88,848,764	£177,841,547	£266,834,330	£355,827,113	£444,819,896	£533,812,679	£622,805,462	£711,798,245	£800,791,028
	5%	-£111,421,003	-£22,428,219	£66,564,564	£155,557,347	£244,550,130	£333,542,913	£422,535,696	£511,528,479	£600,521,262	£689,514,045	£778,506,828
	6%	-£133,705,203	-£44,712,420	£44,280,363	£133,273,146	£222,265,929	£311,258,712	£400,251,495	£489,244,278	£578,237,061	£667,229,844	£756,222,627
	7%	-£155,989,404	-£66,996,621	£21,996,163	£110,988,946	£199,981,729	£288,974,512	£377,967,295	£466,960,078	£555,952,861	£644,945,644	£733,938,427
	8%	-£178,273,604	-£89,280,821	-£288,038	£88,704,745	£177,697,528	£266,690,311	£355,683,094	£444,675,877	£533,668,660	£622,661,443	£711,654,226
	9%	-£200,557,805	-£111,565,022	-£22,572,238	£66,420,545	£155,413,328	£244,406,111	£333,398,894	£422,391,677	£511,384,460	£600,377,243	£689,370,026
	10%	-£222,842,005	-£133,849,222	-£44,856,439	£44,136,344	£133,129,127	£222,121,910	£311,114,693	£400,107,476	£489,100,259	£578,093,042	£667,085,825

Figure B.12: Allergic Rhinitis – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£17,596,930	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£35,597,113	£71,194,226	£106,791,340	£142,388,453	£177,985,566	£213,582,679	£249,179,793	£284,776,906	£320,374,019	£355,971,132
	1%	-£12,479,152	£23,117,961	£58,715,074	£94,312,187	£129,909,301	£165,506,414	£201,103,527	£236,700,640	£272,297,753	£307,894,867	£343,491,980
	2%	-£24,958,305	£10,638,809	£46,235,922	£81,833,035	£117,430,148	£153,027,262	£188,624,375	£224,221,488	£259,818,601	£295,415,714	£331,012,828
	3%	-£37,437,457	-£1,840,344	£33,756,770	£69,353,883	£104,950,996	£140,548,109	£176,145,222	£211,742,336	£247,339,449	£282,936,562	£318,533,675
	4%	-£49,916,609	-£14,319,496	£21,277,617	£56,874,731	£92,471,844	£128,068,957	£163,666,070	£199,263,183	£234,860,297	£270,457,410	£306,054,523
	5%	-£62,395,761	-£26,798,648	£8,798,465	£44,395,578	£79,992,691	£115,589,805	£151,186,918	£186,784,031	£222,381,144	£257,978,258	£293,575,371
	6%	-£74,874,914	-£39,277,800	-£3,680,687	£31,916,426	£67,513,539	£103,110,652	£138,707,766	£174,304,879	£209,901,992	£245,499,105	£281,096,218
	7%	-£87,354,066	-£51,756,953	-£16,159,840	£19,437,274	£55,034,387	£90,631,500	£126,228,613	£161,825,727	£197,422,840	£233,019,953	£268,617,066
	8%	-£99,833,218	-£64,236,105	-£28,638,992	£6,958,121	£42,555,235	£78,152,348	£113,749,461	£149,346,574	£184,943,687	£220,540,801	£256,137,914
	9%	-£112,312,371	-£76,715,257	-£41,118,144	-£5,521,031	£30,076,082	£65,673,196	£101,270,309	£136,867,422	£172,464,535	£208,061,648	£243,658,762
	10%	-£124,791,523	-£89,194,410	-£53,597,296	-£18,000,183	£17,596,930	£53,194,043	£88,791,156	£124,388,270	£159,985,383	£195,582,496	£231,179,609

Figure B.13: Allergic Rhinitis – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£29,087,711	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£32,037,402	£64,074,804	£96,112,206	£128,149,608	£160,187,009	£192,224,411	£224,261,813	£256,299,215	£288,336,617	£320,374,019
	1%	-£15,723,732	£16,313,670	£48,351,072	£80,388,474	£112,425,876	£144,463,278	£176,500,680	£208,538,081	£240,575,483	£272,612,885	£304,650,287
	2%	-£31,447,464	£589,938	£32,627,340	£64,664,742	£96,702,144	£128,739,546	£160,776,948	£192,814,350	£224,851,751	£256,889,153	£288,926,555
	3%	-£47,171,196	-£15,133,794	£16,903,608	£48,941,010	£80,978,412	£113,015,814	£145,053,216	£177,090,618	£209,128,020	£241,165,421	£273,202,823
	4%	-£62,894,928	-£30,857,526	£1,179,876	£33,217,278	£65,254,680	£97,292,082	£129,329,484	£161,366,886	£193,404,288	£225,441,690	£257,479,091
	5%	-£78,618,659	-£46,581,257	-£14,543,856	£17,493,546	£49,530,948	£81,568,350	£113,605,752	£145,643,154	£177,680,556	£209,717,958	£241,755,360
	6%	-£94,342,391	-£62,304,989	-£30,267,587	£1,769,814	£33,807,216	£65,844,618	£97,882,020	£129,919,422	£161,956,824	£193,994,226	£226,031,628
	7%	-£110,066,123	-£78,028,721	-£45,991,319	-£13,953,917	£18,083,484	£50,120,886	£82,158,288	£114,195,690	£146,233,092	£178,270,494	£210,307,896
	8%	-£125,789,855	-£93,752,453	-£61,715,051	-£29,677,649	£2,359,753	£34,397,154	£66,434,556	£98,471,958	£130,509,360	£162,546,762	£194,584,164
	9%	-£141,513,587	-£109,476,185	-£77,438,783	-£45,401,381	-£13,363,979	£18,673,423	£50,710,824	£82,748,226	£114,785,628	£146,823,030	£178,860,432
	10%	-£157,237,319	-£125,199,917	-£93,162,515	-£61,125,113	-£29,087,711	£2,949,691	£34,987,093	£67,024,494	£99,061,896	£131,099,298	£163,136,700

Figure B.14: Allergic Rhinitis – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£37,006,330	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£16,018,701	£32,037,402	£48,056,103	£64,074,804	£80,093,505	£96,112,206	£112,130,907	£128,149,608	£144,168,309	£160,187,009
	1%	-£10,108,113	£5,910,588	£21,929,289	£37,947,989	£53,966,690	£69,985,391	£86,004,092	£102,022,793	£118,041,494	£134,060,195	£150,078,896
	2%	-£20,216,227	-£4,197,526	£11,821,175	£27,839,876	£43,858,577	£59,877,278	£75,895,979	£91,914,680	£107,933,381	£123,952,082	£139,970,783
	3%	-£30,324,340	-£14,305,639	£1,713,062	£17,731,763	£33,750,464	£49,769,165	£65,787,866	£81,806,567	£97,825,268	£113,843,968	£129,862,669
	4%	-£40,432,453	-£24,413,752	-£8,395,052	£7,623,649	£23,642,350	£39,661,051	£55,679,752	£71,698,453	£87,717,154	£103,735,855	£119,754,556
	5%	-£50,540,567	-£34,521,866	-£18,503,165	-£2,484,464	£13,534,237	£29,552,938	£45,571,639	£61,590,340	£77,609,041	£93,627,742	£109,646,443
	6%	-£60,648,680	-£44,629,979	-£28,611,278	-£12,592,577	£3,426,124	£19,444,825	£35,463,526	£51,482,227	£67,500,927	£83,519,628	£99,538,329
	7%	-£70,756,793	-£54,738,093	-£38,719,392	-£22,700,691	-£6,681,990	£9,336,711	£25,355,412	£41,374,113	£57,392,814	£73,411,515	£89,430,216
	8%	-£80,864,907	-£64,846,206	-£48,827,505	-£32,808,804	-£16,790,103	-£771,402	£15,247,299	£31,266,000	£47,284,701	£63,303,402	£79,322,103
	9%	-£90,973,020	-£74,954,319	-£58,935,618	-£42,916,917	-£26,898,216	-£10,879,515	£5,139,186	£21,157,886	£37,176,587	£53,195,288	£69,213,989
	10%	-£101,081,134	-£85,062,433	-£69,043,732	-£53,025,031	-£37,006,330	-£20,987,629	-£4,968,928	£11,049,773	£27,068,474	£43,087,175	£59,105,876

Figure B.15: Allergic Rhinitis – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£21,962,218	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£5,339,567	£10,679,134	£16,018,701	£21,358,268	£26,697,835	£32,037,402	£37,376,969	£42,716,536	£48,056,103	£53,395,670
	1%	-£4,332,049	£1,007,518	£6,347,085	£11,686,652	£17,026,219	£22,365,786	£27,705,353	£33,044,920	£38,384,487	£43,724,054	£49,063,621
	2%	-£8,664,097	-£3,324,530	£2,015,037	£7,354,604	£12,694,171	£18,033,738	£23,373,305	£28,712,872	£34,052,439	£39,392,006	£44,731,573
	3%	-£12,996,146	-£7,656,579	-£2,317,012	£3,022,555	£8,362,122	£13,701,689	£19,041,256	£24,380,823	£29,720,390	£35,059,957	£40,399,524
	4%	-£17,328,194	-£11,988,627	-£6,649,060	-£1,309,493	£4,030,074	£9,369,641	£14,709,208	£20,048,775	£25,388,342	£30,727,909	£36,067,476
	5%	-£21,660,243	-£16,320,676	-£10,981,109	-£5,641,542	-£301,975	£5,037,592	£10,377,159	£15,716,726	£21,056,293	£26,395,860	£31,735,427
	6%	-£25,992,291	-£20,652,724	-£15,313,158	-£9,973,591	-£4,634,024	£705,543	£6,045,110	£11,384,677	£16,724,244	£22,063,811	£27,403,378
	7%	-£30,324,340	-£24,984,773	-£19,645,206	-£14,305,639	-£8,966,072	-£3,626,505	£1,713,062	£7,052,629	£12,392,196	£17,731,763	£23,071,330
	8%	-£34,656,389	-£29,316,822	-£23,977,255	-£18,637,688	-£13,298,121	-£7,958,554	-£2,618,987	£2,720,580	£8,060,147	£13,399,714	£18,739,281
	9%	-£38,988,437	-£33,648,870	-£28,309,303	-£22,969,736	-£17,630,169	-£12,290,602	-£6,951,035	-£1,611,468	£3,728,099	£9,067,666	£14,407,233
	10%	-£43,320,486	-£37,980,919	-£32,641,352	-£27,301,785	-£21,962,218	-£16,622,651	-£11,283,084	-£5,943,517	-£603,950	£4,735,617	£10,075,184

Figure B.16: GAD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£116,414,330	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£88,992,783	£177,985,566	£266,978,349	£355,971,132	£444,963,915	£533,956,698	£622,949,481	£711,942,264	£800,935,047	£889,927,831
	1%	-£23,955,680	£65,037,103	£154,029,886	£243,022,669	£332,015,452	£421,008,235	£510,001,018	£598,993,801	£687,986,584	£776,979,367	£865,972,150
	2%	-£47,911,361	£41,081,423	£130,074,206	£219,066,989	£308,059,772	£397,052,555	£486,045,338	£575,038,121	£664,030,904	£753,023,687	£842,016,470
	3%	-£71,867,041	£17,125,742	£106,118,525	£195,111,308	£284,104,091	£373,096,874	£462,089,658	£551,082,441	£640,075,224	£729,068,007	£818,060,790
	4%	-£95,822,721	-£6,829,938	£82,162,845	£171,155,628	£260,148,411	£349,141,194	£438,133,977	£527,126,760	£616,119,543	£705,112,326	£794,105,109
	5%	-£119,778,401	-£30,785,618	£58,207,165	£147,199,948	£236,192,731	£325,185,514	£414,178,297	£503,171,080	£592,163,863	£681,156,646	£770,149,429
	6%	-£143,734,082	-£54,741,299	£34,251,485	£123,244,268	£212,237,051	£301,229,834	£390,222,617	£479,215,400	£568,208,183	£657,200,966	£746,193,749
	7%	-£167,689,762	-£78,696,979	£10,295,804	£99,288,587	£188,281,370	£277,274,153	£366,266,936	£455,259,720	£544,252,503	£633,245,286	£722,238,069
	8%	-£191,645,442	-£102,652,659	-£13,659,876	£75,332,907	£164,325,690	£253,318,473	£342,311,256	£431,304,039	£520,296,822	£609,289,605	£698,282,388
	9%	-£215,601,122	-£126,608,339	-£37,615,556	£51,377,227	£140,370,010	£229,362,793	£318,355,576	£407,348,359	£496,341,142	£585,333,925	£674,326,708
	10%	-£239,556,803	-£150,564,020	-£61,571,237	£27,421,547	£116,414,330	£205,407,113	£294,399,896	£383,392,679	£472,385,462	£561,378,245	£650,371,028

Figure B.17: GAD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£8,236,643	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£35,597,113	£71,194,226	£106,791,340	£142,388,453	£177,985,566	£213,582,679	£249,179,793	£284,776,906	£320,374,019	£355,971,132
	1%	-£13,415,181	£22,181,932	£57,779,045	£93,376,159	£128,973,272	£164,570,385	£200,167,498	£235,764,612	£271,361,725	£306,958,838	£342,555,951
	2%	-£26,830,362	£8,766,751	£44,363,865	£79,960,978	£115,558,091	£151,155,204	£186,752,317	£222,349,431	£257,946,544	£293,543,657	£329,140,770
	3%	-£40,245,543	-£4,648,430	£30,948,684	£66,545,797	£102,142,910	£137,740,023	£173,337,136	£208,934,250	£244,531,363	£280,128,476	£315,725,589
	4%	-£53,660,724	-£18,063,611	£17,533,503	£53,130,616	£88,727,729	£124,324,842	£159,921,956	£195,519,069	£231,116,182	£266,713,295	£302,310,408
	5%	-£67,075,905	-£31,478,792	£4,118,322	£39,715,435	£75,312,548	£110,909,661	£146,506,775	£182,103,888	£217,701,001	£253,298,114	£288,895,227
	6%	-£80,491,086	-£44,893,972	-£9,296,859	£26,300,254	£61,897,367	£97,494,480	£133,091,594	£168,688,707	£204,285,820	£239,882,933	£275,480,047
	7%	-£93,906,267	-£58,309,153	-£22,712,040	£12,885,073	£48,482,186	£84,079,299	£119,676,413	£155,273,526	£190,870,639	£226,467,752	£262,064,866
	8%	-£107,321,448	-£71,724,334	-£36,127,221	-£530,108	£35,067,005	£70,664,119	£106,261,232	£141,858,345	£177,455,458	£213,052,571	£248,649,685
	9%	-£120,736,629	-£85,139,515	-£49,542,402	-£13,945,289	£21,651,824	£57,248,938	£92,846,051	£128,443,164	£164,040,277	£199,637,390	£235,234,504
	10%	-£134,151,809	-£98,554,696	-£62,957,583	-£27,360,470	£8,236,643	£43,833,757	£79,430,870	£115,027,983	£150,625,096	£186,222,210	£221,819,323

Figure B.18: GAD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£40,881,672	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£32,037,402	£64,074,804	£96,112,206	£128,149,608	£160,187,009	£192,224,411	£224,261,813	£256,299,215	£288,336,617	£320,374,019
	1%	-£16,903,128	£15,134,274	£47,171,676	£79,209,078	£111,246,480	£143,283,882	£175,321,283	£207,358,685	£239,396,087	£271,433,489	£303,470,891
	2%	-£33,806,256	-£1,768,854	£30,268,548	£62,305,950	£94,343,352	£126,380,754	£158,418,155	£190,455,557	£222,492,959	£254,530,361	£286,567,763
	3%	-£50,709,384	-£18,671,982	£13,365,420	£45,402,822	£77,440,224	£109,477,626	£141,515,027	£173,552,429	£205,589,831	£237,627,233	£269,664,635
	4%	-£67,612,512	-£35,575,110	-£3,537,708	£28,499,694	£60,537,096	£92,574,498	£124,611,899	£156,649,301	£188,686,703	£220,724,105	£252,761,507
	5%	-£84,515,640	-£52,478,238	-£20,440,836	£11,596,566	£43,633,968	£75,671,370	£107,708,771	£139,746,173	£171,783,575	£203,820,977	£235,858,379
	6%	-£101,418,768	-£69,381,366	-£37,343,964	-£5,306,562	£26,730,840	£58,768,242	£90,805,643	£122,843,045	£154,880,447	£186,917,849	£218,955,251
	7%	-£118,321,896	-£86,284,494	-£54,247,092	-£22,209,690	£9,827,712	£41,865,114	£73,902,515	£105,939,917	£137,977,319	£170,014,721	£202,052,123
	8%	-£135,225,024	-£103,187,622	-£71,150,220	-£39,112,818	-£7,075,416	£24,961,986	£56,999,387	£89,036,789	£121,074,191	£153,111,593	£185,148,995
	9%	-£152,128,152	-£120,090,750	-£88,053,348	-£56,015,946	-£23,978,544	£8,058,858	£40,096,259	£72,133,661	£104,171,063	£136,208,465	£168,245,867
	10%	-£169,031,280	-£136,993,878	-£104,956,476	-£72,919,074	-£40,881,672	-£8,844,270	£23,193,131	£55,230,533	£87,267,935	£119,305,337	£151,342,739

Figure B.19: GAD – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£44,588,162	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£16,018,701	£32,037,402	£48,056,103	£64,074,804	£80,093,505	£96,112,206	£112,130,907	£128,149,608	£144,168,309	£160,187,009
	1%	-£10,866,297	£5,152,404	£21,171,105	£37,189,806	£53,208,507	£69,227,208	£85,245,909	£101,264,610	£117,283,311	£133,302,012	£149,320,713
	2%	-£21,732,593	-£5,713,892	£10,304,809	£26,323,510	£42,342,211	£58,360,912	£74,379,613	£90,398,314	£106,417,014	£122,435,715	£138,454,416
	3%	-£32,598,890	-£16,580,189	-£561,488	£15,457,213	£31,475,914	£47,494,615	£63,513,316	£79,532,017	£95,550,718	£111,569,419	£127,588,120
	4%	-£43,465,186	-£27,446,485	-£11,427,784	£4,590,917	£20,609,618	£36,628,318	£52,647,019	£68,665,720	£84,684,421	£100,703,122	£116,721,823
	5%	-£54,331,483	-£38,312,782	-£22,294,081	-£6,275,380	£9,743,321	£25,762,022	£41,780,723	£57,799,424	£73,818,125	£89,836,826	£105,855,527
	6%	-£65,197,779	-£49,179,078	-£33,160,378	-£17,141,677	-£1,122,976	£14,895,725	£30,914,426	£46,933,127	£62,951,828	£78,970,529	£94,989,230
	7%	-£76,064,076	-£60,045,375	-£44,026,674	-£28,007,973	-£11,989,272	£4,029,429	£20,048,130	£36,066,831	£52,085,532	£68,104,233	£84,122,934
	8%	-£86,930,373	-£70,911,672	-£54,892,971	-£38,874,270	-£22,855,569	-£6,836,868	£9,181,833	£25,200,534	£41,219,235	£57,237,936	£73,256,637
	9%	-£97,796,669	-£81,777,968	-£65,759,267	-£49,740,566	-£33,721,865	-£17,703,164	-£1,684,463	£14,334,238	£30,352,938	£46,371,639	£62,390,340
	10%	-£108,662,966	-£92,644,265	-£76,625,564	-£60,606,863	-£44,588,162	-£28,569,461	-£12,550,760	£3,467,941	£19,486,642	£35,505,343	£51,524,044

Figure B.20: GAD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£25,211,574	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£5,339,567	£10,679,134	£16,018,701	£21,358,268	£26,697,835	£32,037,402	£37,376,969	£42,716,536	£48,056,103	£53,395,670
	1%	-£4,656,984	£682,583	£6,022,150	£11,361,717	£16,701,284	£22,040,851	£27,380,418	£32,719,985	£38,059,552	£43,399,119	£48,738,686
	2%	-£9,313,968	-£3,974,402	£1,365,165	£6,704,732	£12,044,299	£17,383,866	£22,723,433	£28,063,000	£33,402,567	£38,742,134	£44,081,701
	3%	-£13,970,953	-£8,631,386	-£3,291,819	£2,047,748	£7,387,315	£12,726,882	£18,066,449	£23,406,016	£28,745,583	£34,085,150	£39,424,717
	4%	-£18,627,937	-£13,288,370	-£7,948,803	-£2,609,236	£2,730,331	£8,069,898	£13,409,465	£18,749,032	£24,088,599	£29,428,166	£34,767,733
	5%	-£23,284,921	-£17,945,354	-£12,605,787	-£7,266,220	-£1,926,653	£3,412,914	£8,752,481	£14,092,048	£19,431,615	£24,771,182	£30,110,749
	6%	-£27,941,905	-£22,602,338	-£17,262,771	-£11,923,205	-£6,583,638	-£1,244,071	£4,095,496	£9,435,063	£14,774,630	£20,114,197	£25,453,764
	7%	-£32,598,890	-£27,259,323	-£21,919,756	-£16,580,189	-£11,240,622	-£5,901,055	-£561,488	£4,778,079	£10,117,646	£15,457,213	£20,796,780
	8%	-£37,255,874	-£31,916,307	-£26,576,740	-£21,237,173	-£15,897,606	-£10,558,039	-£5,218,472	£121,095	£5,460,662	£10,800,229	£16,139,796
	9%	-£41,912,858	-£36,573,291	-£31,233,724	-£25,894,157	-£20,554,590	-£15,215,023	-£9,875,456	-£4,535,889	£803,678	£6,143,245	£11,482,812
	10%	-£46,569,842	-£41,230,275	-£35,890,708	-£30,551,141	-£25,211,574	-£19,872,008	-£14,532,441	-£9,192,874	-£3,853,307	£1,486,260	£6,825,827

Appendix C: Any Damp Problem

Costs

Table C.1: Intervention cost (total population): by tenure

Tenure	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Owner	£0	£19,992,372	£19,992,372	£0	£1,199,542	£1,199,542
Private rented	£0	£19,947,280	£19,947,280	£0	£1,196,837	£1,196,837
Local authority	£0	£4,841,458	£4,841,458	£0	£290,487	£290,487
Housing association	£0	£4,76,700	£4,766,700	£0	£286,002	£286,002
Total	**£0**	**£49,547,809**	**£49,547,809**	**£0**	**£2,972,869**	**£2,972,869**

Table C.2: Health condition costs (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	£496,322,091	£446,689,882	-£49,632,209	£96,485,015	£86,836,513	-£9,648,501
COPD	£229,960,334	£206,964,301	-£22,996,033	£44,704,289	£40,233,860	-£4,470,429
Allergic rhinitis	£310,174,956	£279,157,461	-£31,017,496	£60,298,012	£54,268,210	-£6,029,801
Generalised anxiety disorder	£333,440,371	£300,096,334	-£33,344,037	£64,820,808	£58,338,727	-£6,482,081
Total	**£1,369,897,753**	**£1,232,907,977**	**-£136,989,775**	**£266,308,123**	**£239,677,311**	**-£26,630,812**

Health condition related QALY losses

Table C.3: Health condition related QALY losses (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	61,073	54,966	6,107	11,873	10,685	1,187
COPD	37,290	33,561	3,729	7,249	6,521	725
Allergic rhinitis	24,196	21,776	2,420	4,704	4,233	470
Generalised anxiety disorder	64,479	58,031	6,448	12,535	11,281	1,253
Total	**187,038**	**168,334**	**18,704**	**36,360**	**32,724**	**3,636**

Number of cases

Table C.4: Number of symptomatic cases (total population)

Health condition	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Asthma	157,941	142,147	-15,794	30,704	27,633	-3,070
COPD	35,612	32,051	-3,561	6,923	6,231	-692
Allergic rhinitis	178,062	160,256	-17,806	34,615	31,154	-3,462
Generalised anxiety disorder	78,347	70,513	-7,835	15,231	13,708	-1,523
Total	**449,964**	**404,967**	**-44,996**	**87,473**	**78,726**	**-8,747**

Incremental cost per case avoided

Table C.5: Incremental cost per symptomatic case avoided (total population)

Health condition	Low risk	Extreme risk
Asthma	£5	£2,174
COPD	£7,456	£2,163
Allergic rhinitis	£1,041	£883
Generalised anxiety disorder	£2,068	£2,304

Number of events avoided

Table C.6: Number of events avoided (total population)

Health condition	Event	Low risk				Extreme risk			
		Pre-intervention	Post-intervention	Incremental	Cost per event avoided	Pre-intervention	Post-intervention	Incremental	Cost per event avoided
Asthma	Moderate exacerbation	15,794	14,215	-1,579	£53	3,070	2,763	-307	£21,742
	Severe exacerbation	1,579	1,421	-158	£534	307	276	-31	£217,420
	Outpatient visit	1,013,405	912,064	-101,340	£1	197,006	177,305	-19,701	£339
	Home visit	43,788	39,410	-4,379	£19	8,512	7,661	-851	£7,842
	Hospitalisation	264	238	-26	£3,192	51	46	-5	£1,298,808
COPD	Non-severe exacerbation	23,162	20,846	-2,316	£11,464	4,503	4,052	-450	£3,326
	Severe	4,975	4,478	-498	£53,368	967	870	-97	£15,484
	Primary health professional visit	88,271	79,444	-8,827	£3,008	17,160	15,444	-1,716	£873
	Secondary health professional visit	13,806	12,425	-1,381	£19,232	2,684	2,415	-268	£5,580
Allergic rhinitis	Physician visit	427,350	384,615	-42,735	£434	83,077	74,769	-8,308	£368
	Extra GP specialist visit	22,614	20,353	-2,261	£8,194	4,396	3,957	-440	£6,954
	Acute ward visit	2,849	2,564	-285	£65,041	554	498	-55	£55,195
Generalised anxiety disorder	Inpatient care (days)	70,199	63,179	-7,020	£2,308	13,647	12,282	-1,365	£2,571
	Outpatient visit	50,142	45,128	-5,014	£3,232	9,748	8,773	-975	£3,600
	Primary health professional visit	122,222	110,000	-12,222	£1,326	23,760	21,384	-2,376	£1,477
	Community day care session	705,127	634,615	-70,513	£230	137,077	123,369	-13,708	£256

Childhood asthma

Table C.7: Lifetime costs and utility decrement associated with paediatric asthma (total population)

Lifetime asthma	Low risk			Extreme risk		
	Pre-intervention	Post-intervention	Incremental	Pre-intervention	Post-intervention	Incremental
Costs	£2,974,712,986	£2,677,241,687	-£297,471,299	£578,284,204	£520,455,784	-£57,828,420
Utility decrement	366,041	329,437	-36,604	71,158	64,043	-7,116

Figure C.1: Asthma – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£84,400	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£12,386,952	£24,773,904	£37,160,857	£49,547,809	£61,934,761	£74,321,713	£86,708,665	£99,095,617	£111,482,570	£123,869,522
	1%	-£4,963,221	£7,423,731	£19,810,683	£32,197,636	£44,584,588	£56,971,540	£69,358,492	£81,745,444	£94,132,397	£106,519,349	£118,906,301
	2%	-£9,926,442	£2,460,510	£14,847,463	£27,234,415	£39,621,367	£52,008,319	£64,395,271	£76,782,223	£89,169,176	£101,556,128	£113,943,080
	3%	-£14,889,663	-£2,502,711	£9,884,242	£22,271,194	£34,658,146	£47,045,098	£59,432,050	£71,819,003	£84,205,955	£96,592,907	£108,979,859
	4%	-£19,852,884	-£7,465,931	£4,921,021	£17,307,973	£29,694,925	£42,081,877	£54,468,829	£66,855,782	£79,242,734	£91,629,686	£104,016,638
	5%	-£24,816,105	-£12,429,152	-£42,200	£12,344,752	£24,731,704	£37,118,656	£49,505,609	£61,892,561	£74,279,513	£86,666,465	£99,053,417
	6%	-£29,779,325	-£17,392,373	-£5,005,421	£7,381,531	£19,768,483	£32,155,435	£44,542,388	£56,929,340	£69,316,292	£81,703,244	£94,090,196
	7%	-£34,742,546	-£22,355,594	-£9,968,642	£2,418,310	£14,805,262	£27,192,215	£39,579,167	£51,966,119	£64,353,071	£76,740,023	£89,126,975
	8%	-£39,705,767	-£27,318,815	-£14,931,863	-£2,544,911	£9,842,041	£22,228,994	£34,615,946	£47,002,898	£59,389,850	£71,776,802	£84,163,754
	9%	-£44,668,988	-£32,282,036	-£19,895,084	-£7,508,132	£4,878,820	£17,265,773	£29,652,725	£42,039,677	£54,426,629	£66,813,581	£79,200,534
	10%	-£49,632,209	-£37,245,257	-£24,858,305	-£12,471,353	-£84,400	£12,302,552	£24,689,504	£37,076,456	£49,463,408	£61,850,360	£74,237,313

Figure C.2: Asthma – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£7,974,914	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,954,781	£9,909,562	£14,864,343	£19,819,123	£24,773,904	£29,728,685	£34,683,466	£39,638,247	£44,593,028	£49,547,809
	1%	-£2,779,404	£2,175,377	£7,130,158	£12,084,939	£17,039,720	£21,994,501	£26,949,282	£31,904,062	£36,858,843	£41,813,624	£46,768,405
	2%	-£5,558,807	-£604,027	£4,350,754	£9,305,535	£14,260,316	£19,215,097	£24,169,878	£29,124,659	£34,079,440	£39,034,220	£43,989,001
	3%	-£8,338,211	-£3,383,430	£1,571,351	£6,526,131	£11,480,912	£16,435,693	£21,390,474	£26,345,255	£31,300,036	£36,254,817	£41,209,598
	4%	-£11,117,615	-£6,162,834	-£1,208,053	£3,746,728	£8,701,509	£13,656,290	£18,611,070	£23,565,851	£28,520,632	£33,475,413	£38,430,194
	5%	-£13,897,019	-£8,942,238	-£3,987,457	£967,324	£5,922,105	£10,876,886	£15,831,667	£20,786,448	£25,741,228	£30,696,009	£35,650,790
	6%	-£16,676,422	-£11,721,641	-£6,766,861	-£1,812,080	£3,142,701	£8,097,482	£13,052,263	£18,007,044	£22,961,825	£27,916,606	£32,871,386
	7%	-£19,455,826	-£14,501,045	-£9,546,264	-£4,591,483	£363,298	£5,318,078	£10,272,859	£15,227,640	£20,182,421	£25,137,202	£30,091,983
	8%	-£22,235,230	-£17,280,449	-£12,325,668	-£7,370,887	-£2,416,106	£2,538,675	£7,493,456	£12,448,236	£17,403,017	£22,357,798	£27,312,579
	9%	-£25,014,633	-£20,059,853	-£15,105,072	-£10,150,291	-£5,195,510	-£240,729	£4,714,052	£9,668,833	£14,623,614	£19,578,394	£24,533,175
	10%	-£27,794,037	-£22,839,256	-£17,884,475	-£12,929,695	-£7,974,914	-£3,020,133	£1,934,648	£6,889,429	£11,844,210	£16,798,991	£21,753,772

Figure C.3: Asthma – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£17,183,276	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,459,303	£8,918,606	£13,377,908	£17,837,211	£22,296,514	£26,755,817	£31,215,119	£35,674,422	£40,133,725	£44,593,028
	1%	-£3,502,049	£957,254	£5,416,557	£9,875,860	£14,335,162	£18,794,465	£23,253,768	£27,713,071	£32,172,374	£36,631,676	£41,090,979
	2%	-£7,004,097	-£2,544,795	£1,914,508	£6,373,811	£10,833,114	£15,292,417	£19,751,719	£24,211,022	£28,670,325	£33,129,628	£37,588,930
	3%	-£10,506,146	-£6,046,843	-£1,587,540	£2,871,762	£7,331,065	£11,790,368	£16,249,671	£20,708,973	£25,168,276	£29,627,579	£34,086,882
	4%	-£14,008,195	-£9,548,892	-£5,089,589	-£630,286	£3,829,016	£8,288,319	£12,747,622	£17,206,925	£21,666,228	£26,125,530	£30,584,833
	5%	-£17,510,243	-£13,050,941	-£8,591,638	-£4,132,335	£326,968	£4,786,271	£9,245,573	£13,704,876	£18,164,179	£22,623,482	£27,082,784
	6%	-£21,012,292	-£16,552,989	-£12,093,686	-£7,634,384	-£3,175,081	£1,284,222	£5,743,525	£10,202,827	£14,662,130	£19,121,433	£23,580,736
	7%	-£24,514,341	-£20,055,038	-£15,595,735	-£11,136,432	-£6,677,130	-£2,217,827	£2,241,476	£6,700,779	£11,160,082	£15,619,384	£20,078,687
	8%	-£28,016,389	-£23,557,087	-£19,097,784	-£14,638,481	-£10,179,178	-£5,719,875	-£1,260,573	£3,198,730	£7,658,033	£12,117,336	£16,576,638
	9%	-£31,518,438	-£27,059,135	-£22,599,833	-£18,140,530	-£13,681,227	-£9,221,924	-£4,762,621	-£303,319	£4,155,984	£8,615,287	£13,074,590
	10%	-£35,020,487	-£30,561,184	-£26,101,881	-£21,642,578	-£17,183,276	-£12,723,973	-£8,264,670	-£3,805,367	£653,936	£5,113,238	£9,572,541

Figure C.4: Asthma – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£13,594,564	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£2,229,651	£4,459,303	£6,688,954	£8,918,606	£11,148,257	£13,377,908	£15,607,560	£17,837,211	£20,066,863	£22,296,514
	1%	-£2,251,317	-£21,666	£2,207,986	£4,437,637	£6,667,289	£8,896,940	£11,126,591	£13,356,243	£15,585,894	£17,815,546	£20,045,197
	2%	-£4,502,634	-£2,272,983	-£43,331	£2,186,320	£4,415,972	£6,645,623	£8,875,274	£11,104,926	£13,334,577	£15,564,229	£17,793,880
	3%	-£6,753,951	-£4,524,300	-£2,294,648	-£64,997	£2,164,655	£4,394,306	£6,623,957	£8,853,609	£11,083,260	£13,312,912	£15,542,563
	4%	-£9,005,268	-£6,775,617	-£4,545,965	-£2,316,314	-£86,662	£2,142,989	£4,372,640	£6,602,292	£8,831,943	£11,061,595	£13,291,246
	5%	-£11,256,585	-£9,026,934	-£6,797,282	-£4,567,631	-£2,337,979	-£108,328	£2,121,323	£4,350,975	£6,580,626	£8,810,277	£11,039,929
	6%	-£13,507,902	-£11,278,251	-£9,048,599	-£6,818,948	-£4,589,296	-£2,359,645	-£129,994	£2,099,658	£4,329,309	£6,558,960	£8,788,612
	7%	-£15,759,219	-£13,529,568	-£11,299,916	-£9,070,265	-£6,840,613	-£4,610,962	-£2,381,311	-£151,659	£2,077,992	£4,307,643	£6,537,295
	8%	-£18,010,536	-£15,780,885	-£13,551,233	-£11,321,582	-£9,091,930	-£6,862,279	-£4,632,628	-£2,402,976	-£173,325	£2,056,326	£4,285,978
	9%	-£20,261,853	-£18,032,202	-£15,802,550	-£13,572,899	-£11,343,247	-£9,113,596	-£6,883,945	-£4,654,293	-£2,424,642	-£194,991	£2,034,661
	10%	-£22,513,170	-£20,283,519	-£18,053,867	-£15,824,216	-£13,594,564	-£11,364,913	-£9,135,262	-£6,905,610	-£4,675,959	-£2,446,308	-£216,656

Figure C.5: Asthma – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£6,675,633	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£743,217	£1,486,434	£2,229,651	£2,972,869	£3,716,086	£4,459,303	£5,202,520	£5,945,737	£6,688,954	£7,432,171
	1%	-£964,850	-£221,633	£521,584	£1,264,801	£2,008,018	£2,751,236	£3,494,453	£4,237,670	£4,980,887	£5,724,104	£6,467,321
	2%	-£1,929,700	-£1,186,483	-£443,266	£299,951	£1,043,168	£1,786,385	£2,529,602	£3,272,820	£4,016,037	£4,759,254	£5,502,471
	3%	-£2,894,550	-£2,151,333	-£1,408,116	-£664,899	£78,318	£821,535	£1,564,752	£2,307,969	£3,051,187	£3,794,404	£4,537,621
	4%	-£3,859,401	-£3,116,183	-£2,372,966	-£1,629,749	-£886,532	-£143,315	£599,902	£1,343,119	£2,086,336	£2,829,554	£3,572,771
	5%	-£4,824,251	-£4,081,034	-£3,337,816	-£2,594,599	-£1,851,382	-£1,108,165	-£364,948	£378,269	£1,121,486	£1,864,703	£2,607,921
	6%	-£5,789,101	-£5,045,884	-£4,302,667	-£3,559,449	-£2,816,232	-£2,073,015	-£1,329,798	-£586,581	£156,636	£899,853	£1,643,070
	7%	-£6,753,951	-£6,010,734	-£5,267,517	-£4,524,300	-£3,781,082	-£3,037,865	-£2,294,648	-£1,551,431	-£808,214	-£64,997	£678,220
	8%	-£7,718,801	-£6,975,584	-£6,232,367	-£5,489,150	-£4,745,933	-£4,002,716	-£3,259,498	-£2,516,281	-£1,773,064	-£1,029,847	-£286,630
	9%	-£8,683,651	-£7,940,434	-£7,197,217	-£6,454,000	-£5,710,783	-£4,967,566	-£4,224,349	-£3,481,131	-£2,737,914	-£1,994,697	-£1,251,480
	10%	-£9,648,501	-£8,905,284	-£8,162,067	-£7,418,850	-£6,675,633	-£5,932,416	-£5,189,199	-£4,445,982	-£3,702,764	-£2,959,547	-£2,216,330

Figure C.6: COPD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£26,551,775	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£12,386,952	£24,773,904	£37,160,857	£49,547,809	£61,934,761	£74,321,713	£86,708,665	£99,095,617	£111,482,570	£123,869,522
	1%	-£2,299,603	£10,087,349	£22,474,301	£34,861,253	£47,248,205	£59,635,158	£72,022,110	£84,409,062	£96,796,014	£109,182,966	£121,569,918
	2%	-£4,599,207	£7,787,746	£20,174,698	£32,561,650	£44,948,602	£57,335,554	£69,722,506	£82,109,459	£94,496,411	£106,883,363	£119,270,315
	3%	-£6,898,810	£5,488,142	£17,875,094	£30,262,047	£42,648,999	£55,035,951	£67,422,903	£79,809,855	£92,196,807	£104,583,760	£116,970,712
	4%	-£9,198,413	£3,188,539	£15,575,491	£27,962,443	£40,349,395	£52,736,348	£65,123,300	£77,510,252	£89,897,204	£102,284,156	£114,671,108
	5%	-£11,498,017	£888,935	£13,275,888	£25,662,840	£38,049,792	£50,436,744	£62,823,696	£75,210,649	£87,597,601	£99,984,553	£112,371,505
	6%	-£13,797,620	-£1,410,668	£10,976,284	£23,363,237	£35,750,189	£48,137,141	£60,524,093	£72,911,045	£85,297,997	£97,684,950	£110,071,902
	7%	-£16,097,223	-£3,710,271	£8,676,681	£21,063,633	£33,450,585	£45,837,538	£58,224,490	£70,611,442	£82,998,394	£95,385,346	£107,772,298
	8%	-£18,396,827	-£6,009,875	£6,377,078	£18,764,030	£31,150,982	£43,537,934	£55,924,886	£68,311,839	£80,698,791	£93,085,743	£105,472,695
	9%	-£20,696,430	-£8,309,478	£4,077,474	£16,464,426	£28,851,379	£41,238,331	£53,625,283	£66,012,235	£78,399,187	£90,786,140	£103,173,092
	10%	-£22,996,033	-£10,609,081	£1,777,871	£14,164,823	£26,551,775	£38,938,728	£51,325,680	£63,712,632	£76,099,584	£88,486,536	£100,873,488

Figure C.7: COPD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£6,941,345	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,954,781	£9,909,562	£14,864,343	£19,819,123	£24,773,904	£29,728,685	£34,683,466	£39,638,247	£44,593,028	£49,547,809
	1%	-£1,287,778	£3,667,003	£8,621,784	£13,576,565	£18,531,346	£23,486,126	£28,440,907	£33,395,688	£38,350,469	£43,305,250	£48,260,031
	2%	-£2,575,556	£2,379,225	£7,334,006	£12,288,787	£17,243,568	£22,198,349	£27,153,129	£32,107,910	£37,062,691	£42,017,472	£46,972,253
	3%	-£3,863,334	£1,091,447	£6,046,228	£11,001,009	£15,955,790	£20,910,571	£25,865,352	£30,820,132	£35,774,913	£40,729,694	£45,684,475
	4%	-£5,151,111	-£196,331	£4,758,450	£9,713,231	£14,668,012	£19,622,793	£24,577,574	£29,532,355	£34,487,135	£39,441,916	£44,396,697
	5%	-£6,438,889	-£1,484,108	£3,470,672	£8,425,453	£13,380,234	£18,335,015	£23,289,796	£28,244,577	£33,199,358	£38,154,138	£43,108,919
	6%	-£7,726,667	-£2,771,886	£2,182,895	£7,137,675	£12,092,456	£17,047,237	£22,002,018	£26,956,799	£31,911,580	£36,866,361	£41,821,141
	7%	-£9,014,445	-£4,059,664	£895,117	£5,849,898	£10,804,678	£15,759,459	£20,714,240	£25,669,021	£30,623,802	£35,578,583	£40,533,364
	8%	-£10,302,223	-£5,347,442	-£392,661	£4,562,120	£9,516,901	£14,471,681	£19,426,462	£24,381,243	£29,336,024	£34,290,805	£39,245,586
	9%	-£11,590,001	-£6,635,220	-£1,680,439	£3,274,342	£8,229,123	£13,183,904	£18,138,684	£23,093,465	£28,048,246	£33,003,027	£37,957,808
	10%	-£12,877,779	-£7,922,998	-£2,968,217	£1,986,564	£6,941,345	£11,896,126	£16,850,907	£21,805,687	£26,760,468	£31,715,249	£36,670,030

Figure C.8: COPD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£1,611,210	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,459,303	£8,918,606	£13,377,908	£17,837,211	£22,296,514	£26,755,817	£31,215,119	£35,674,422	£40,133,725	£44,593,028
	1%	-£1,622,600	£2,836,703	£7,296,005	£11,755,308	£16,214,611	£20,673,914	£25,133,217	£29,592,519	£34,051,822	£38,511,125	£42,970,428
	2%	-£3,245,200	£1,214,103	£5,673,405	£10,132,708	£14,592,011	£19,051,314	£23,510,616	£27,969,919	£32,429,222	£36,888,525	£41,347,828
	3%	-£4,867,800	-£408,498	£4,050,805	£8,510,108	£12,969,411	£17,428,714	£21,888,016	£26,347,319	£30,806,622	£35,265,925	£39,725,227
	4%	-£6,490,400	-£2,031,098	£2,428,205	£6,887,508	£11,346,811	£15,806,113	£20,265,416	£24,724,719	£29,184,022	£33,643,325	£38,102,627
	5%	-£8,113,001	-£3,653,698	£805,605	£5,264,908	£9,724,211	£14,183,513	£18,642,816	£23,102,119	£27,561,422	£32,020,724	£36,480,027
	6%	-£9,735,601	-£5,276,298	-£816,995	£3,642,308	£8,101,610	£12,560,913	£17,020,216	£21,479,519	£25,938,822	£30,398,124	£34,857,427
	7%	-£11,358,201	-£6,898,898	-£2,439,595	£2,019,708	£6,479,010	£10,938,313	£15,397,616	£19,856,919	£24,316,221	£28,775,524	£33,234,827
	8%	-£12,980,801	-£8,521,498	-£4,062,195	£397,107	£4,856,410	£9,315,713	£13,775,016	£18,234,319	£22,693,621	£27,152,924	£31,612,227
	9%	-£14,603,401	-£10,144,098	-£5,684,795	-£1,225,493	£3,233,810	£7,693,113	£12,152,416	£16,611,718	£21,071,021	£25,530,324	£29,989,627
	10%	-£16,226,001	-£11,766,698	-£7,307,396	-£2,848,093	£1,611,210	£6,070,513	£10,529,816	£14,989,118	£19,448,421	£23,907,724	£28,367,027

Figure C.9: COPD – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£1,512,395	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£2,229,651	£4,459,303	£6,688,954	£8,918,606	£11,148,257	£13,377,908	£15,607,560	£17,837,211	£20,066,863	£22,296,514
	1%	-£1,043,100	£1,186,551	£3,416,203	£5,645,854	£7,875,505	£10,105,157	£12,334,808	£14,564,460	£16,794,111	£19,023,762	£21,253,414
	2%	-£2,086,200	£143,451	£2,373,103	£4,602,754	£6,832,405	£9,062,057	£11,291,708	£13,521,360	£15,751,011	£17,980,662	£20,210,314
	3%	-£3,129,300	-£899,649	£1,330,003	£3,559,654	£5,789,305	£8,018,957	£10,248,608	£12,478,260	£14,707,911	£16,937,562	£19,167,214
	4%	-£4,172,400	-£1,942,749	£286,902	£2,516,554	£4,746,205	£6,975,857	£9,205,508	£11,435,159	£13,664,811	£15,894,462	£18,124,114
	5%	-£5,215,500	-£2,985,849	-£756,198	£1,473,454	£3,703,105	£5,932,757	£8,162,408	£10,392,059	£12,621,711	£14,851,362	£17,081,014
	6%	-£6,258,600	-£4,028,949	-£1,799,298	£430,354	£2,660,005	£4,889,657	£7,119,308	£9,348,959	£11,578,611	£13,808,262	£16,037,913
	7%	-£7,301,701	-£5,072,049	-£2,842,398	-£612,746	£1,616,905	£3,846,556	£6,076,208	£8,305,859	£10,535,511	£12,765,162	£14,994,813
	8%	-£8,344,801	-£6,115,149	-£3,885,498	-£1,655,846	£573,805	£2,803,456	£5,033,108	£7,262,759	£9,492,411	£11,722,062	£13,951,713
	9%	-£9,387,901	-£7,158,249	-£4,928,598	-£2,698,946	-£469,295	£1,760,356	£3,990,008	£6,219,659	£8,449,310	£10,678,962	£12,908,613
	10%	-£10,431,001	-£8,201,349	-£5,971,698	-£3,742,047	-£1,512,395	£717,256	£2,946,908	£5,176,559	£7,406,210	£9,635,862	£11,865,513

Figure C.10: COPD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£1,497,560	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£743,217	£1,486,434	£2,229,651	£2,972,869	£3,716,086	£4,459,303	£5,202,520	£5,945,737	£6,688,954	£7,432,171
	1%	-£447,043	£296,174	£1,039,391	£1,782,609	£2,525,826	£3,269,043	£4,012,260	£4,755,477	£5,498,694	£6,241,911	£6,985,128
	2%	-£894,086	-£150,869	£592,348	£1,335,566	£2,078,783	£2,822,000	£3,565,217	£4,308,434	£5,051,651	£5,794,868	£6,538,086
	3%	-£1,341,129	-£597,912	£145,306	£888,523	£1,631,740	£2,374,957	£3,118,174	£3,861,391	£4,604,608	£5,347,826	£6,091,043
	4%	-£1,788,172	-£1,044,954	-£301,737	£441,480	£1,184,697	£1,927,914	£2,671,131	£3,414,348	£4,157,565	£4,900,783	£5,644,000
	5%	-£2,235,214	-£1,491,997	-£748,780	-£5,563	£737,654	£1,480,871	£2,224,088	£2,967,305	£3,710,523	£4,453,740	£5,196,957
	6%	-£2,682,257	-£1,939,040	-£1,195,823	-£452,606	£290,611	£1,033,828	£1,777,045	£2,520,263	£3,263,480	£4,006,697	£4,749,914
	7%	-£3,129,300	-£2,386,083	-£1,642,866	-£899,649	-£156,432	£586,785	£1,330,003	£2,073,220	£2,816,437	£3,559,654	£4,302,871
	8%	-£3,576,343	-£2,833,126	-£2,089,909	-£1,346,692	-£603,475	£139,743	£882,960	£1,626,177	£2,369,394	£3,112,611	£3,855,828
	9%	-£4,023,386	-£3,280,169	-£2,536,952	-£1,793,735	-£1,050,517	-£307,300	£435,917	£1,179,134	£1,922,351	£2,665,568	£3,408,785
	10%	-£4,470,429	-£3,727,212	-£2,983,995	-£2,240,777	-£1,497,560	-£754,343	-£11,126	£732,091	£1,475,308	£2,218,525	£2,961,742

Figure C.11: Allergic Rhinitis – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£18,530,313	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£12,386,952	£24,773,904	£37,160,857	£49,547,809	£61,934,761	£74,321,713	£86,708,665	£99,095,617	£111,482,570	£123,869,522
	1%	-£3,101,750	£9,285,203	£21,672,155	£34,059,107	£46,446,059	£58,833,011	£71,219,964	£83,606,916	£95,993,868	£108,380,820	£120,767,772
	2%	-£6,203,499	£6,183,453	£18,570,405	£30,957,357	£43,344,310	£55,731,262	£68,118,214	£80,505,166	£92,892,118	£105,279,070	£117,666,023
	3%	-£9,305,249	£3,081,703	£15,468,656	£27,855,608	£40,242,560	£52,629,512	£65,016,464	£77,403,417	£89,790,369	£102,177,321	£114,564,273
	4%	-£12,406,998	-£20,046	£12,366,906	£24,753,858	£37,140,810	£49,527,763	£61,914,715	£74,301,667	£86,688,619	£99,075,571	£111,462,524
	5%	-£15,508,748	-£3,121,796	£9,265,157	£21,652,109	£34,039,061	£46,426,013	£58,812,965	£71,199,917	£83,586,870	£95,973,822	£108,360,774
	6%	-£18,610,497	-£6,223,545	£6,163,407	£18,550,359	£30,937,311	£43,324,264	£55,711,216	£68,098,168	£80,485,120	£92,872,072	£105,259,024
	7%	-£21,712,247	-£9,325,295	£3,061,657	£15,448,610	£27,835,562	£40,222,514	£52,609,466	£64,996,418	£77,383,370	£89,770,323	£102,157,275
	8%	-£24,813,997	-£12,427,044	-£40,092	£12,346,860	£24,733,812	£37,120,764	£49,507,717	£61,894,669	£74,281,621	£86,668,573	£99,055,525
	9%	-£27,915,746	-£15,528,794	-£3,141,842	£9,245,110	£21,632,063	£34,019,015	£46,405,967	£58,792,919	£71,179,871	£83,566,824	£95,953,776
	10%	-£31,017,496	-£18,630,543	-£6,243,591	£6,143,361	£18,530,313	£30,917,265	£43,304,217	£55,691,170	£68,078,122	£80,465,074	£92,852,026

Figure C.12: Allergic Rhinitis – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£2,449,326	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,954,781	£9,909,562	£14,864,343	£19,819,123	£24,773,904	£29,728,685	£34,683,466	£39,638,247	£44,593,028	£49,547,809
	1%	-£1,736,980	£3,217,801	£8,172,582	£13,127,363	£18,082,144	£23,036,925	£27,991,705	£32,946,486	£37,901,267	£42,856,048	£47,810,829
	2%	-£3,473,960	£1,480,821	£6,435,602	£11,390,383	£16,345,164	£21,299,945	£26,254,726	£31,209,507	£36,164,287	£41,119,068	£46,073,849
	3%	-£5,210,939	-£256,158	£4,698,622	£9,653,403	£14,608,184	£19,562,965	£24,517,746	£29,472,527	£34,427,308	£39,382,089	£44,336,869
	4%	-£6,947,919	-£1,993,138	£2,961,643	£7,916,424	£12,871,204	£17,825,985	£22,780,766	£27,735,547	£32,690,328	£37,645,109	£42,599,890
	5%	-£8,684,899	-£3,730,118	£1,224,663	£6,179,444	£11,134,225	£16,089,006	£21,043,786	£25,998,567	£30,953,348	£35,908,129	£40,862,910
	6%	-£10,421,879	-£5,467,098	-£512,317	£4,442,464	£9,397,245	£14,352,026	£19,306,807	£24,261,588	£29,216,368	£34,171,149	£39,125,930
	7%	-£12,158,858	-£7,204,077	-£2,249,297	£2,705,484	£7,660,265	£12,615,046	£17,569,827	£22,524,608	£27,479,389	£32,434,170	£37,388,950
	8%	-£13,895,838	-£8,941,057	-£3,986,276	£968,505	£5,923,285	£10,878,066	£15,832,847	£20,787,628	£25,742,409	£30,697,190	£35,651,971
	9%	-£15,632,818	-£10,678,037	-£5,723,256	-£768,475	£4,186,306	£9,141,087	£14,095,867	£19,050,648	£24,005,429	£28,960,210	£33,914,991
	10%	-£17,369,798	-£12,415,017	-£7,460,236	-£2,505,455	£2,449,326	£7,404,107	£12,358,888	£17,313,669	£22,268,449	£27,223,230	£32,178,011

Figure C.13: Allergic Rhinitis – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£4,048,734	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,459,303	£8,918,606	£13,377,908	£17,837,211	£22,296,514	£26,755,817	£31,215,119	£35,674,422	£40,133,725	£44,593,028
	1%	-£2,188,594	£2,270,708	£6,730,011	£11,189,314	£15,648,617	£20,107,919	£24,567,222	£29,026,525	£33,485,828	£37,945,131	£42,404,433
	2%	-£4,377,189	£82,114	£4,541,417	£9,000,719	£13,460,022	£17,919,325	£22,378,628	£26,837,931	£31,297,233	£35,756,536	£40,215,839
	3%	-£6,565,783	-£2,106,481	£2,352,822	£6,812,125	£11,271,428	£15,730,730	£20,190,033	£24,649,336	£29,108,639	£33,567,942	£38,027,244
	4%	-£8,754,378	-£4,295,075	£164,228	£4,623,530	£9,082,833	£13,542,136	£18,001,439	£22,460,742	£26,920,044	£31,379,347	£35,838,650
	5%	-£10,942,972	-£6,483,670	-£2,024,367	£2,434,936	£6,894,239	£11,353,541	£15,812,844	£20,272,147	£24,731,450	£29,190,753	£33,650,055
	6%	-£13,131,567	-£8,672,264	-£4,212,961	£246,341	£4,705,644	£9,164,947	£13,624,250	£18,083,553	£22,542,855	£27,002,158	£31,461,461
	7%	-£15,320,161	-£10,860,859	-£6,401,556	-£1,942,253	£2,517,050	£6,976,352	£11,435,655	£15,894,958	£20,354,261	£24,813,564	£29,272,866
	8%	-£17,508,756	-£13,049,453	-£8,590,150	-£4,130,848	£328,455	£4,787,758	£9,247,061	£13,706,364	£18,165,666	£22,624,969	£27,084,272
	9%	-£19,697,350	-£15,238,048	-£10,778,745	-£6,319,442	-£1,860,139	£2,599,163	£7,058,466	£11,517,769	£15,977,072	£20,436,375	£24,895,677
	10%	-£21,885,945	-£17,426,642	-£12,967,339	-£8,508,037	-£4,048,734	£410,569	£4,869,872	£9,329,175	£13,788,477	£18,247,780	£22,707,083

Figure C.14: Allergic Rhinitis – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£5,150,930	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£2,229,651	£4,459,303	£6,688,954	£8,918,606	£11,148,257	£13,377,908	£15,607,560	£17,837,211	£20,066,863	£22,296,514
	1%	-£1,406,954	£822,698	£3,052,349	£5,282,001	£7,511,652	£9,741,303	£11,970,955	£14,200,606	£16,430,258	£18,659,909	£20,889,560
	2%	-£2,813,907	-£584,256	£1,645,396	£3,875,047	£6,104,698	£8,334,350	£10,564,001	£12,793,653	£15,023,304	£17,252,955	£19,482,607
	3%	-£4,220,861	-£1,991,209	£238,442	£2,468,093	£4,697,745	£6,927,396	£9,157,048	£11,386,699	£13,616,350	£15,846,002	£18,075,653
	4%	-£5,627,814	-£3,398,163	-£1,168,512	£1,061,140	£3,290,791	£5,520,443	£7,750,094	£9,979,745	£12,209,397	£14,439,048	£16,668,700
	5%	-£7,034,768	-£4,805,117	-£2,575,465	-£345,814	£1,883,838	£4,113,489	£6,343,140	£8,572,792	£10,802,443	£13,032,095	£15,261,746
	6%	-£8,441,722	-£6,212,070	-£3,982,419	-£1,752,767	£476,884	£2,706,535	£4,936,187	£7,165,838	£9,395,490	£11,625,141	£13,854,792
	7%	-£9,848,675	-£7,619,024	-£5,389,372	-£3,159,721	-£930,070	£1,299,582	£3,529,233	£5,758,885	£7,988,536	£10,218,187	£12,447,839
	8%	-£11,255,629	-£9,025,977	-£6,796,326	-£4,566,675	-£2,337,023	-£107,372	£2,122,280	£4,351,931	£6,581,582	£8,811,234	£11,040,885
	9%	-£12,662,582	-£10,432,931	-£8,203,280	-£5,973,628	-£3,743,977	-£1,514,325	£715,326	£2,944,977	£5,174,629	£7,404,280	£9,633,932
	10%	-£14,069,536	-£11,839,885	-£9,610,233	-£7,380,582	-£5,150,930	-£2,921,279	-£691,628	£1,538,024	£3,767,675	£5,997,327	£8,226,978

Figure C.15: Allergic Rhinitis – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£3,056,933	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£743,217	£1,486,434	£2,229,651	£2,972,869	£3,716,086	£4,459,303	£5,202,520	£5,945,737	£6,688,954	£7,432,171
	1%	-£602,980	£140,237	£883,454	£1,626,671	£2,369,888	£3,113,106	£3,856,323	£4,599,540	£5,342,757	£6,085,974	£6,829,191
	2%	-£1,205,960	-£462,743	£280,474	£1,023,691	£1,766,908	£2,510,125	£3,253,343	£3,996,560	£4,739,777	£5,482,994	£6,226,211
	3%	-£1,808,940	-£1,065,723	-£322,506	£420,711	£1,163,928	£1,907,145	£2,650,362	£3,393,580	£4,136,797	£4,880,014	£5,623,231
	4%	-£2,411,920	-£1,668,703	-£925,486	-£182,269	£560,948	£1,304,165	£2,047,382	£2,790,599	£3,533,817	£4,277,034	£5,020,251
	5%	-£3,014,901	-£2,271,683	-£1,528,466	-£785,249	-£42,032	£701,185	£1,444,402	£2,187,619	£2,930,836	£3,674,054	£4,417,271
	6%	-£3,617,881	-£2,874,664	-£2,131,446	-£1,388,229	-£645,012	£98,205	£841,422	£1,584,639	£2,327,856	£3,071,073	£3,814,291
	7%	-£4,220,861	-£3,477,644	-£2,734,427	-£1,991,209	-£1,247,992	-£504,775	£238,442	£981,659	£1,724,876	£2,468,093	£3,211,311
	8%	-£4,823,841	-£4,080,624	-£3,337,407	-£2,594,190	-£1,850,972	-£1,107,755	-£364,538	£378,679	£1,121,896	£1,865,113	£2,608,330
	9%	-£5,426,821	-£4,683,604	-£3,940,387	-£3,197,170	-£2,453,953	-£1,710,735	-£967,518	-£224,301	£518,916	£1,262,133	£2,005,350
	10%	-£6,029,801	-£5,286,584	-£4,543,367	-£3,800,150	-£3,056,933	-£2,313,715	-£1,570,498	-£827,281	-£84,064	£659,153	£1,402,370

Figure C.16: GAD – low risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£16,203,772	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£12,386,952	£24,773,904	£37,160,857	£49,547,809	£61,934,761	£74,321,713	£86,708,665	£99,095,617	£111,482,570	£123,869,522
	1%	-£3,334,404	£9,052,548	£21,439,501	£33,826,453	£46,213,405	£58,600,357	£70,987,309	£83,374,262	£95,761,214	£108,148,166	£120,535,118
	2%	-£6,668,807	£5,718,145	£18,105,097	£30,492,049	£42,879,001	£55,265,953	£67,652,906	£80,039,858	£92,426,810	£104,813,762	£117,200,714
	3%	-£10,003,211	£2,383,741	£14,770,693	£27,157,645	£39,544,598	£51,931,550	£64,318,502	£76,705,454	£89,092,406	£101,479,358	£113,866,311
	4%	-£13,337,615	-£950,663	£11,436,290	£23,823,242	£36,210,194	£48,597,146	£60,984,098	£73,371,050	£85,758,003	£98,144,955	£110,531,907
	5%	-£16,672,019	-£4,285,066	£8,101,886	£20,488,838	£32,875,790	£45,262,742	£57,649,695	£70,036,647	£82,423,599	£94,810,551	£107,197,503
	6%	-£20,006,422	-£7,619,470	£4,767,482	£17,154,434	£29,541,386	£41,928,339	£54,315,291	£66,702,243	£79,089,195	£91,476,147	£103,863,100
	7%	-£23,340,826	-£10,953,874	£1,433,078	£13,820,031	£26,206,983	£38,593,935	£50,980,887	£63,367,839	£75,754,791	£88,141,744	£100,528,696
	8%	-£26,675,230	-£14,288,277	-£1,901,325	£10,485,627	£22,872,579	£35,259,531	£47,646,483	£60,033,436	£72,420,388	£84,807,340	£97,194,292
	9%	-£30,009,633	-£17,622,681	-£5,235,729	£7,151,223	£19,538,175	£31,925,128	£44,312,080	£56,699,032	£69,085,984	£81,472,936	£93,859,888
	10%	-£33,344,037	-£20,957,085	-£8,570,133	£3,816,819	£16,203,772	£28,590,724	£40,977,676	£53,364,628	£65,751,580	£78,138,533	£90,525,485

Figure C.17: GAD – moderate risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	£1,146,463	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,954,781	£9,909,562	£14,864,343	£19,819,123	£24,773,904	£29,728,685	£34,683,466	£39,638,247	£44,593,028	£49,547,809
	1%	-£1,867,266	£3,087,515	£8,042,296	£12,997,077	£17,951,857	£22,906,638	£27,861,419	£32,816,200	£37,770,981	£42,725,762	£47,680,543
	2%	-£3,734,532	£1,220,249	£6,175,030	£11,129,810	£16,084,591	£21,039,372	£25,994,153	£30,948,934	£35,903,715	£40,858,496	£45,813,277
	3%	-£5,601,798	-£647,017	£4,307,764	£9,262,544	£14,217,325	£19,172,106	£24,126,887	£29,081,668	£34,036,449	£38,991,230	£43,946,010
	4%	-£7,469,064	-£2,514,283	£2,440,497	£7,395,278	£12,350,059	£17,304,840	£22,259,621	£27,214,402	£32,169,183	£37,123,964	£42,078,744
	5%	-£9,336,330	-£4,381,550	£573,231	£5,528,012	£10,482,793	£15,437,574	£20,392,355	£25,347,136	£30,301,917	£35,256,697	£40,211,478
	6%	-£11,203,596	-£6,248,816	-£1,294,035	£3,660,746	£8,615,527	£13,570,308	£18,525,089	£23,479,870	£28,434,651	£33,389,431	£38,344,212
	7%	-£13,070,863	-£8,116,082	-£3,161,301	£1,793,480	£6,748,261	£11,703,042	£16,657,823	£21,612,604	£26,567,384	£31,522,165	£36,476,946
	8%	-£14,938,129	-£9,983,348	-£5,028,567	-£73,786	£4,880,995	£9,835,776	£14,790,557	£19,745,337	£24,700,118	£29,654,899	£34,609,680
	9%	-£16,805,395	-£11,850,614	-£6,895,833	-£1,941,052	£3,013,729	£7,968,510	£12,923,291	£17,878,071	£22,832,852	£27,787,633	£32,742,414
	10%	-£18,672,661	-£13,717,880	-£8,763,099	-£3,808,318	£1,146,463	£6,101,244	£11,056,024	£16,010,805	£20,965,586	£25,920,367	£30,875,148

Figure C.18: GAD – high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£5,690,341	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£4,459,303	£8,918,606	£13,377,908	£17,837,211	£22,296,514	£26,755,817	£31,215,119	£35,674,422	£40,133,725	£44,593,028
	1%	-£2,352,755	£2,106,548	£6,565,850	£11,025,153	£15,484,456	£19,943,759	£24,403,061	£28,862,364	£33,321,667	£37,780,970	£42,240,273
	2%	-£4,705,511	-£246,208	£4,213,095	£8,672,398	£13,131,701	£17,591,003	£22,050,306	£26,509,609	£30,968,912	£35,428,215	£39,887,517
	3%	-£7,058,266	-£2,598,963	£1,860,340	£6,319,643	£10,778,945	£15,238,248	£19,697,551	£24,156,854	£28,616,157	£33,075,459	£37,534,762
	4%	-£9,411,021	-£4,951,718	-£492,415	£3,966,887	£8,426,190	£12,885,493	£17,344,796	£21,804,098	£26,263,401	£30,722,704	£35,182,007
	5%	-£11,763,776	-£7,304,473	-£2,845,171	£1,614,132	£6,073,435	£10,532,738	£14,992,040	£19,451,343	£23,910,646	£28,369,949	£32,829,252
	6%	-£14,116,532	-£9,657,229	-£5,197,926	-£738,623	£3,720,680	£8,179,982	£12,639,285	£17,098,588	£21,557,891	£26,017,194	£30,476,496
	7%	-£16,469,287	-£12,009,984	-£7,550,681	-£3,091,378	£1,367,924	£5,827,227	£10,286,530	£14,745,833	£19,205,135	£23,664,438	£28,123,741
	8%	-£18,822,042	-£14,362,739	-£9,903,436	-£5,444,134	-£984,831	£3,474,472	£7,933,775	£12,393,077	£16,852,380	£21,311,683	£25,770,986
	9%	-£21,174,797	-£16,715,495	-£12,256,192	-£7,796,889	-£3,337,586	£1,121,717	£5,581,019	£10,040,322	£14,499,625	£18,958,928	£23,418,231
	10%	-£23,527,553	-£19,068,250	-£14,608,947	-£10,149,644	-£5,690,341	-£1,231,039	£3,228,264	£7,687,567	£12,146,870	£16,606,172	£21,065,475

Figure C.19: GAD – very high risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£6,206,250	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£2,229,651	£4,459,303	£6,688,954	£8,918,606	£11,148,257	£13,377,908	£15,607,560	£17,837,211	£20,066,863	£22,296,514
	1%	-£1,512,486	£717,166	£2,946,817	£5,176,469	£7,406,120	£9,635,771	£11,865,423	£14,095,074	£16,324,726	£18,554,377	£20,784,028
	2%	-£3,024,971	-£795,320	£1,434,332	£3,663,983	£5,893,635	£8,123,286	£10,352,937	£12,582,589	£14,812,240	£17,041,891	£19,271,543
	3%	-£4,537,457	-£2,307,805	-£78,154	£2,151,498	£4,381,149	£6,610,800	£8,840,452	£11,070,103	£13,299,755	£15,529,406	£17,759,057
	4%	-£6,049,942	-£3,820,291	-£1,590,639	£639,012	£2,868,663	£5,098,315	£7,327,966	£9,557,618	£11,787,269	£14,016,920	£16,246,572
	5%	-£7,562,428	-£5,332,776	-£3,103,125	-£873,473	£1,356,178	£3,585,829	£5,815,481	£8,045,132	£10,274,784	£12,504,435	£14,734,086
	6%	-£9,074,913	-£6,845,262	-£4,615,610	-£2,385,959	-£156,308	£2,073,344	£4,302,995	£6,532,647	£8,762,298	£10,991,949	£13,221,601
	7%	-£10,587,399	-£8,357,747	-£6,128,096	-£3,898,444	-£1,668,793	£560,858	£2,790,510	£5,020,161	£7,249,812	£9,479,464	£11,709,115
	8%	-£12,099,884	-£9,870,233	-£7,640,581	-£5,410,930	-£3,181,279	-£951,627	£1,278,024	£3,507,676	£5,737,327	£7,966,978	£10,196,630
	9%	-£13,612,370	-£11,382,718	-£9,153,067	-£6,923,416	-£4,693,764	-£2,464,113	-£234,461	£1,995,190	£4,224,841	£6,454,493	£8,684,144
	10%	-£15,124,855	-£12,895,204	-£10,665,552	-£8,435,901	-£6,206,250	-£3,976,598	-£1,746,947	£482,705	£2,712,356	£4,942,007	£7,171,659

Figure C.20: GAD – extreme risk: 100% implementation rate

		Upfront cost of intervention (per dwelling)										
	-£3,509,212	£0.00	£25.00	£50.00	£75.00	£100.00	£125.00	£150.00	£175.00	£200.00	£225.00	£250.00
Relative reduction in health condition associated symptoms due to intervention	0%	£0	£743,217	£1,486,434	£2,229,651	£2,972,869	£3,716,086	£4,459,303	£5,202,520	£5,945,737	£6,688,954	£7,432,171
	1%	-£648,208	£95,009	£838,226	£1,581,443	£2,324,660	£3,067,878	£3,811,095	£4,554,312	£5,297,529	£6,040,746	£6,783,963
	2%	-£1,296,416	-£553,199	£190,018	£933,235	£1,676,452	£2,419,669	£3,162,887	£3,906,104	£4,649,321	£5,392,538	£6,135,755
	3%	-£1,944,624	-£1,201,407	-£458,190	£285,027	£1,028,244	£1,771,461	£2,514,679	£3,257,896	£4,001,113	£4,744,330	£5,487,547
	4%	-£2,592,832	-£1,849,615	-£1,106,398	-£363,181	£380,036	£1,123,253	£1,866,470	£2,609,688	£3,352,905	£4,096,122	£4,839,339
	5%	-£3,241,040	-£2,497,823	-£1,754,606	-£1,011,389	-£268,172	£475,045	£1,218,262	£1,961,480	£2,704,697	£3,447,914	£4,191,131
	6%	-£3,889,248	-£3,146,031	-£2,402,814	-£1,659,597	-£916,380	-£173,163	£570,054	£1,313,271	£2,056,489	£2,799,706	£3,542,923
	7%	-£4,537,457	-£3,794,239	-£3,051,022	-£2,307,805	-£1,564,588	-£821,371	-£78,154	£665,063	£1,408,280	£2,151,498	£2,894,715
	8%	-£5,185,665	-£4,442,448	-£3,699,230	-£2,956,013	-£2,212,796	-£1,469,579	-£726,362	£16,855	£760,072	£1,503,290	£2,246,507
	9%	-£5,833,873	-£5,090,656	-£4,347,438	-£3,604,221	-£2,861,004	-£2,117,787	-£1,374,570	-£631,353	£111,864	£855,081	£1,598,299
	10%	-£6,482,081	-£5,738,864	-£4,995,647	-£4,252,429	-£3,509,212	-£2,765,995	-£2,022,778	-£1,279,561	-£536,344	£206,873	£950,090