



# Nottingham City Homes: Decent Homes Impact Study

Social Return on Investment (SROI) report

January 2013

NOTTINGHAM  
TRENT UNIVERSITY 

# Nottingham City Homes: Decent Homes Impact Study

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**This report has been submitted to an independent assurance assessment carried out by The SROI Network. The report shows a good understanding of the SROI process and complies with SROI principles. Assurance here does not include verification of stakeholder engagement, data and calculations. It is a principles-based assessment of the final report.**

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# Nottingham City Homes: Decent Homes Impact Study

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## Executive summary

Nottingham City Homes (NCH) is a social housing provider, managing 28,300 social housing properties on behalf of the local authority, Nottingham City Council. Its vision is to 'create homes and places where people want to live'. In 2008 NCH received funding from the government to implement the Decent Homes programme, the aim of which was to bring all housing up to an acceptable standard, including in the social sector where a backlog of overdue renovation work had accumulated as a result of past under-investment. In Nottingham, the programme focused on making properties 'secure, warm and modern', reflecting tenants' priorities for the work in their homes.

The Government's Green Paper emphasised the wider social benefits that such a programme would deliver:

*People who are decently housed have a stronger sense of security and place. Decent housing strengthens communities and provides a better setting in which to raise families. It improves health and educational achievement and provides a long-term asset that can be passed on to future generations.<sup>1</sup>*

Recognising a lack of evidence of these wider benefits, NCH have undertaken a two-year research project, in partnership with Nottingham Trent University, to measure the wider social impact of its Decent Homes programme. This included a full Social Return on Investment (SROI) analysis focusing on one area of the city, the Aspley ward, which was one of the first areas to receive the Decent Homes programme.

## The theory of change

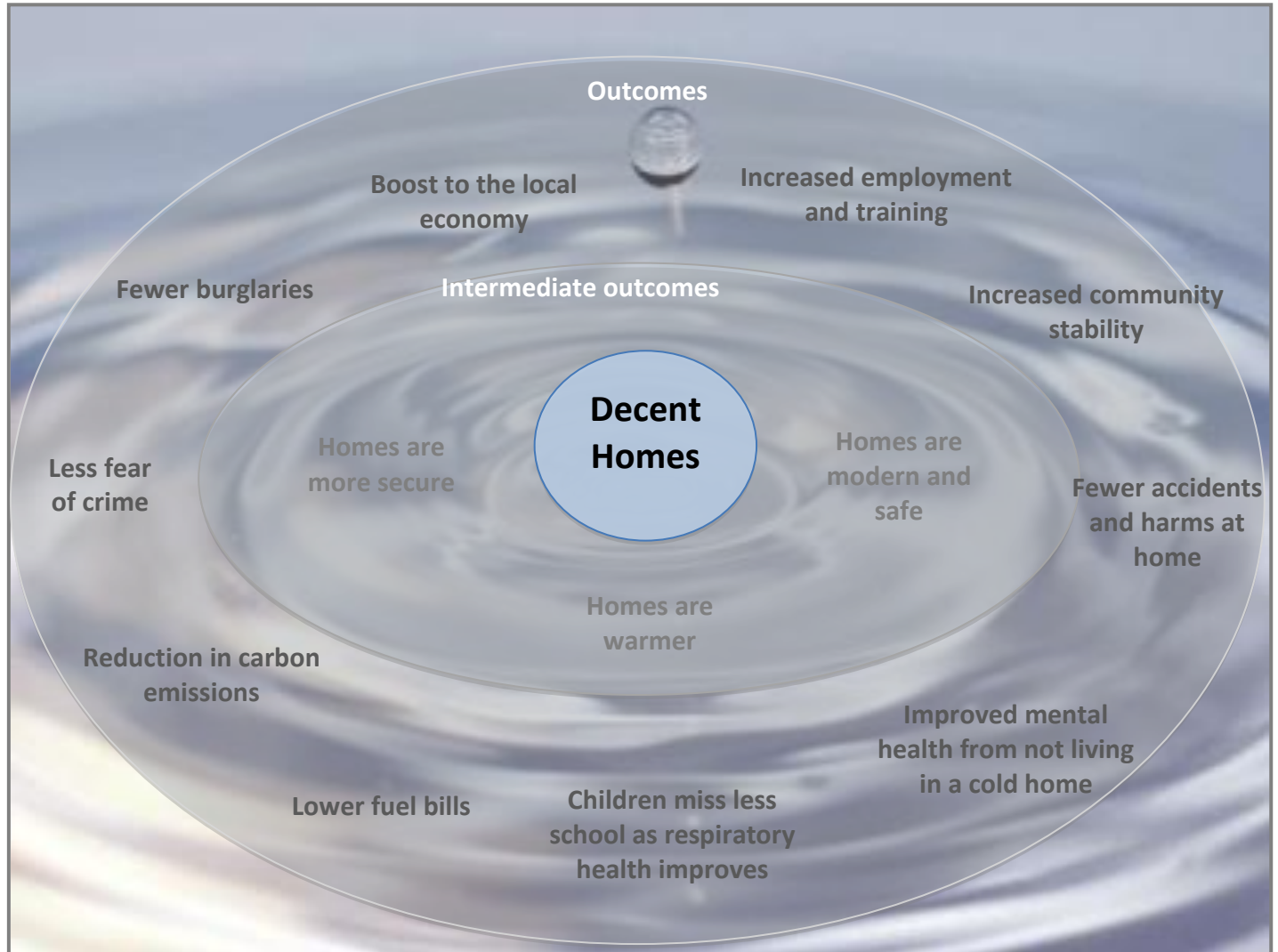
The theory of change sets out how the inputs and activities invested by NCH in the Decent Homes programme result in outcomes or changes experienced by relevant stakeholders. NCH invested £16.6m in upgrading fittings including double glazed windows, full central heating systems, loft insulation and new kitchens and bathrooms in Aspley. From the outset of the Decent Homes programme in Nottingham, it was identified that the investment would make homes more secure, more energy efficient and therefore warmer, and with modern and safe facilities. These intermediate outcomes give rise to the final outcomes that are measured in this evaluation. These are summarised in the theory of change diagram below, which represents the 'ripple effect' that the Decent Homes investment has had firstly on the standard of the properties, and ultimately on people and stakeholders affected by these changes (Figure 1).

The main beneficiaries were NCH tenants themselves, but material outcomes were also experienced by the health care service (Nottingham NHS), Nottinghamshire Police, and the Local Strategic Partnership (One Nottingham), responsible for the city's economic growth and carbon reduction targets.

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<sup>1</sup> Department of the Environment, Transport and the Regions (2000) *Housing Green Paper - Quality and Choice: A Decent Home for All*, p. 7.

Figure 1: Representation of the theory of change for Decent Homes programme



### The Social Return on Investment

The Social Return on Investment is calculated by measuring the change as a result of the Decent Homes programme, and assigning a financial value to that change. This shows that total present value of the changes resulting from the Decent Homes programme in Aspley was calculated to be £25.1m over the five years following the home improvements. Given that the initial investment in Decent Homes in Aspley was £16.6m, this gives the following social return on investment:

**Every £1 invested in the Decent Homes programme in Aspley generates £1.46 in social value**

Further sensitivity analysis suggests that the SROI ratio could range from £1.22 to £1.58 for every £1 invested in Decent Homes.

## Conclusion

The Decent Homes Impact Study has provided valuable evidence on the social impacts of the Secure, Warm, Modern programme in Nottingham, as well as enhancing organisational learning through the process of carrying out the impact study itself. It has added quality and depth to the information used to shape NCH's long-term investment planning, such as the 30-year Asset Management Strategy, focusing not only on the physical state of the property, but also on the impact on people and communities. Finally, the study has supplied the evidence to show the true value of providing a decent home that is secure, warm and modern, capturing the value of the wider social and community benefits envisioned from the outset of the Decent Homes programme. This information has been of value to both NCH and the wider housing sector, and NCH will continue to measure the wider impact of housing investments.

# 1. Introduction

## Background

Nottingham City Homes (NCH) is a social housing provider, managing 28,300 social housing properties on behalf of the local authority, Nottingham City Council. NCH was established as an Arms Length Management Organisation (ALMO) in 2005. Its vision is to 'create homes and places where people want to live', and the organisation aims to:

- Be a first class housing provider in the eyes of its tenants and leaseholders
- Be a major player in improving the quality of life in our neighbourhoods
- Be an excellent place to work, widely regarded as an efficient and professional organisation

In 2008 NCH received funding from the government to implement the Decent Homes programme, the aim of which was to bring all housing up to an acceptable standard, including in the social sector where a backlog of overdue renovation work had accumulated as a result of past under-investment. The vision for the Decent Homes programme was to 'offer everyone the opportunity of a decent home and so promote social cohesion, well-being and self-dependence'.<sup>2</sup>

The national Decent Homes standard specifies that properties should be free from serious hazards, in a reasonable state of repair, with modern facilities and sufficient thermal comfort. Reflecting the national picture, Nottingham's council housing stock required significant investment to address a backlog of major repairs and improvements to bring the 28,300 properties up to the Decent Homes standard. NCH is mid-way through its planned programme, with a total budget of £187 million, due to be completed by March 2015. The programme is known locally as 'Secure, Warm, Modern' (SWM), reflecting tenants' priorities for the work to their homes. This includes the following elements:

- Nottingham Secure – replacing all single-glazed windows with 'Secured by Design' double-glazed units in around 15,300 properties
- Warmth for Nottingham – improving heating systems for 19,700 properties and topping up loft insulation
- Modern Living – making internal improvements including new kitchens for 17,000 homes, new bathrooms in 12,700 homes and electrical rewires where required

The initial Green Paper emphasised the wider social benefits that such a programme would deliver:

*People who are decently housed have a stronger sense of security and place. Decent housing strengthens communities and provides a better setting in which to raise families. It improves health and educational achievement and provides a long-term asset that can be passed on to future generations.<sup>3</sup>*

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<sup>2</sup> Ibid 1.

<sup>3</sup> Ibid 1.

However, ten years on, the National Audit Office reported that information on these wider benefits had not been systematically collected, and therefore the *'lack of data on these wider benefits means that it is not possible to identify the Programme's true impact throughout its life'*.<sup>4</sup> Because of the scale and importance of this investment, NCH wanted to be able to measure this impact to understand how its work affected wider social outcomes, and to use this knowledge to inform the current and future investment programmes to ensure that they deliver the maximum benefits to tenants and communities.

NCH therefore established a Knowledge Transfer Partnership in 2010 with Nottingham Business School at Nottingham Trent University to carry out a two-year research project to measure these wider social impacts of its Decent Homes programme. This aimed to capture the true impact of the programme in Nottingham, filling the gap left at a national level by providing robust evidence on the wider benefits of the Decent Homes programme at a local level. This included a Social Return on Investment (SROI) analysis, to understand the social return on the investment made to properties through the Decent Homes programme. Representatives from NCH's Decent Homes team and Strategy directorate, as well as academic leads from the Business School, formed the project steering group for this impact study.

### Aim and scope

The aim of the SROI analysis was to understand the wider social impact of the substantial investment undertaken by NCH under the Decent Homes programme. Although the Decent Homes programme is only one aspect of NCH's work, it is a very significant part of the company's activities, with considerable financial investment required. NCH wanted to go beyond measuring just the outputs of the programme, to provide robust evidence of the social, economic and environmental outcomes it delivered and the resulting impact on its tenants and communities.

Rather than evaluating the entirety of the project, the decision was taken by the project steering group to focus on one area of the city, within the Aspley ward area. This decision was taken for a number of reasons: firstly, Aspley was one of the first areas to receive the work, therefore providing a reasonable period of time since the improvements for stakeholders to see the changes that this has delivered, and therefore make the evaluative element of the analysis possible. Secondly, the focus on just one area allowed for more detailed consultation with relevant stakeholders and collection of data, to give a more precise picture of the impact in that area. Finally, this was NCH's first experience of undertaking SROI analysis, and so this analysis was to act as a pilot project for potential future wider analysis of the Decent Homes programme as a whole. It is anticipated that the findings from the Aspley area will be indicative of the impact across the wider city area.

The investment in Aspley was completed in stages between April 2008 and March 2011. Windows and doors were completed first (in 2008/09), then heating (2009-11), then kitchens and bathrooms (2010/11). During this time, windows were upgraded in 2,790 properties, 1,740 heating systems were replaced, and 1,680 kitchens and 1,140

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<sup>4</sup> National Audit Office (2010) *The Decent Homes Programme: Report by the Comptroller and Auditor General*, p. 36



bathrooms. This is an evaluative SROI, measuring changes that have occurred since the improvements were completed. For example, many of the outcomes are measured by establishing the amount of change from before the programme began (2008) to the year after the work was completed (2012). The first benefit period measures the changes since the investment was completed, and the SROI projects these continuing benefits over five years following the completion of the investment.

## 2. Identifying the theory of change

### Identifying and involving stakeholders

A stakeholder analysis was carried out at the beginning of the project to identify the main stakeholders in the Decent Homes programme, both internally to the company and externally. This not only identified the stakeholders, but assessed the importance of the programme to them (indicated in Figure 2 by the proximity to the centre of the diagram). Reflecting NCH's values of placing tenants at the heart of its work, tenants and local communities were identified as the most important stakeholder in this evaluation. In addition, a number of other stakeholders were identified as being important to the analysis due to their involvement in delivering the programme and shared impact of the work on their own outcomes and activities. Therefore the main stakeholders included in the analysis were:

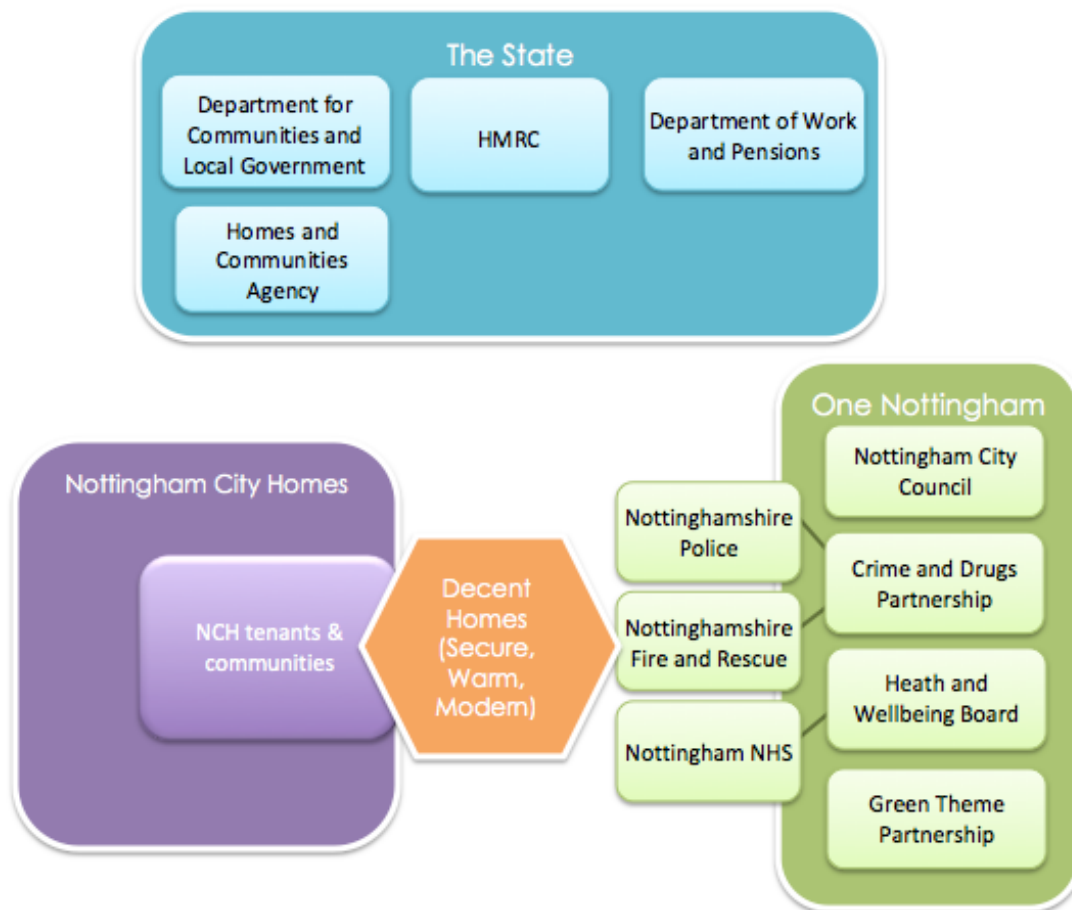
- NCH tenants in the Aspley area (8,155 tenants in 3,343 properties)
- Police (via the Nottingham Crime and Drugs Partnership)
- Nottingham City NHS
- One Nottingham, the Local Strategic Partnership<sup>5</sup>
- The State (national government)

A number of stakeholders initially identified were not included in the final analysis, after consideration of the materiality of the outcomes experienced by them to the scope of the project. For example, the company itself was not included as a stakeholder as the aim of the project was to measure community impacts, rather than business benefits. Similarly, the funding agencies for the project (such as state departments and agencies) were excluded, as although they would be highly interested in the findings of the analysis, their own outcomes were not relevant to the local scope of the project. The impact on Nottingham Fire and Rescue Service was considered, but the outcomes were found not to be material during the sensitivity analysis and therefore were excluded from the final analysis.

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<sup>5</sup> One Nottingham is responsible for the city's overarching long-term Sustainable Communities Strategy, and its membership consists of a range of key organisations from the city. One Nottingham is therefore selected as the stakeholder to represent the interests of the wider city as a whole.

Figure 2: Stakeholder analysis



These stakeholders were consulted initially in order to form the theory of change. The early stages of the project focused on collecting qualitative details from stakeholders on what they felt were the most important changes or benefits as a result of the Decent Homes programme. After an introduction to the project and explanation of the aims of the impact evaluation, stakeholders were asked:

- What impacts do you think Decent Homes will have?
- Which of these are of most important to you?
- Are there any key local indicators or targets that you think Decent Homes might have an impact on?
- Where can information/data be sourced to address this?
- Does your organisation hold any relevant data?
- What do you think will be the main barriers to the project?

Stakeholders consulted to form the theory of change included:

- Decent Homes Customer Care panel: a panel of around 10 tenants

- Housing Strategy Group: Membership consists of representatives from the City Council, other registered providers of social housing, voluntary and community groups, and developers
- Two focus groups were held with members of local Tenant and Resident Associations, focusing on crime and security (full discussion guide included in Appendix 1)
- Discussions with the Police analysts from the Crime and Drugs Partnership, plus interviews with a Police Chief Inspector, local Police beat officers and Community Protection Officers on the anticipated or experienced changes as a result of the Decent Homes work in regards to crime outcomes
- Discussion and extensive literature review on health impact of housing improvements by Nottingham City NHS Public Health department, plus interviews with two local GPs and a Respiratory Consultant on their experience of the health impact of housing improvements
- On-to-one interviews with six tenants on the energy efficiency and health impacts of Decent Homes work (full interview guide included in Appendix 1)
- Meetings with other Housing Organisations/researchers who had completed similar impact evaluations in other areas e.g. Glasgow Housing Association<sup>6</sup> and Sheffield Homes<sup>7</sup>

This extensive consultation at the beginning of the project, plus a literature review of similar impact evaluations, provided the qualitative evidence to form the theory of change, which is now set out in full.

## The theory of change

### Inputs

The main input into the Decent Homes programme is the capital investment in infrastructural elements (windows, heating systems, kitchens and bathrooms etc.) and NCH staff and contractor time in installing and managing the process. The programme costs for Aspley cover both of these elements, and amount to £16.6m. The inputs are assigned to the national government as a stakeholder, as funding for the Decent Homes programme is provided by the Department for Communities and Local Government.

Tenants also have to input a small amount of time, for example in choosing from the design options available to them and providing access to contractors to their homes. However, as NCH works to minimise inconvenience for tenants (for example by having secure key arrangements so that tenants don't have to be present whilst the work is being carried out), a valuation of this time was not calculated or included in the input costs.

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<sup>6</sup> Glasgow Housing Association et al (2009) *Secured by Design Impact Evaluation*  
<http://www.securedbydesign.com/professionals/pdfs/SBD-Evaluation-Key-Findings-2009.pdf>

<sup>7</sup> Gilbertson, Green & Ormandy (2006) *Decent Homes, Better Health*  
[http://www.shu.ac.uk/assets/pdf/cresr-13-SDH\\_HIA\\_report\(8\).pdf](http://www.shu.ac.uk/assets/pdf/cresr-13-SDH_HIA_report(8).pdf)

## Outputs

The outputs from the Decent Homes work are new windows, heating systems, kitchens and bathrooms. Across properties in Aspley between April 2008 and March 2011, these outputs amounted to:

- New windows in 2,972 properties
- Heating upgrades in 1,741 properties
- New kitchen installed in 1,679 properties
- New bathroom installed in 1,140 properties

These outputs are the same across all stakeholders.

## Outcomes

A primary stakeholder group experiencing significant outcomes as a result of Decent Homes are NCH tenants. According to consultations, the most important outcomes were as follows.

Levels of crime, and particularly burglary, have in the past been high across Nottingham, resulting in a number of operations by Nottinghamshire police and their partners in order to tackle crime in the city. Overall, crime in Nottingham has fallen significantly since 2003 and has continued to fall in recent years, with 27 percent less overall crime in 2009 compared to 2007.<sup>8</sup> However, Nottingham has the third-highest level of overall crime amongst its comparator group of similar Community Safety Partnerships (CSPs). Burglary from a dwelling accounts for nine per cent of all crime and is the third-most common type of crime in Nottingham. Burglary has been particularly high in the Aspley ward. Figures on the number of burglaries per 1000 households between 2006 and 2009 show that Aspley was among the wards with the highest number of burglaries across the city.

Tenants in properties where single glazed windows were replaced with double glazed models that meet the Secured by Design (SBD) standard set by the Association of Chief Police Officers anticipated that their homes would be more secure. The outcome therefore is that the *increase in security of properties reduces the number of burglaries*.

The second related outcome is *improved emotional wellbeing as a result of reduction in fear of crime* as a result of making the property more secure. All tenants who have new Secured by Design windows or doors, even if they are not actually burgled, may experience this. Many of the tenants consulted, particularly the elderly, felt considerable concern about potential break-ins, and felt that the new design of windows would/had improved the security and therefore reduced their fear of crime.

**“I had been burgled, and every night I checked everything, it was like an obsessive thing... So from the day I had my windows I felt 100 percent safe”**

*Aspley tenant*

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<sup>8</sup> Data taken from the Nottingham Crime and Drugs Partnership’s 2009/10 Strategic Assessment

Increasing energy efficiency of homes is an important way of addressing fuel poverty, especially as social housing tenants are more likely to be vulnerable to fuel poverty due to low incomes. Households are considered to be in fuel poverty if they would have to spend more than 10% of total household income on fuel costs to heat the home to an adequate living temperature. The elderly, disabled or those in receipt of social security benefits are particularly at risk. Tenants agreed that this was a significant issue, particularly given current increases in fuel prices. Increasing the energy efficiency of the property means that heating costs are more affordable, with less worry about fuel costs.

Fitting energy efficient windows and new heating systems will make homes warmer, and cheaper to heat. The outcome for tenants with new windows and heating systems is therefore that the *increase in thermal efficiency of properties (from new windows and heating) reduces heating bills.*

Having a cold home also has an effect on people's health. Initial consultation with medical professionals from Nottingham NHS's Public Health department confirmed that housing has a significant impact on health and wellbeing. A literature review of existing studies showed the impact of poor housing conditions and housing improvements on both physical and mental health.<sup>9</sup> A summary of the main evidence on physical health implications of poor housing is shown in **Error! Reference source not found.**

This was also supported by tenants' comments about their homes:

**"The other windows used to have condensation running down them"**

**"The condensation made you feel the house was dirty".**

**"Previously you could see gaps around the window."**

**"Before the house was cold, now it's warmer."**

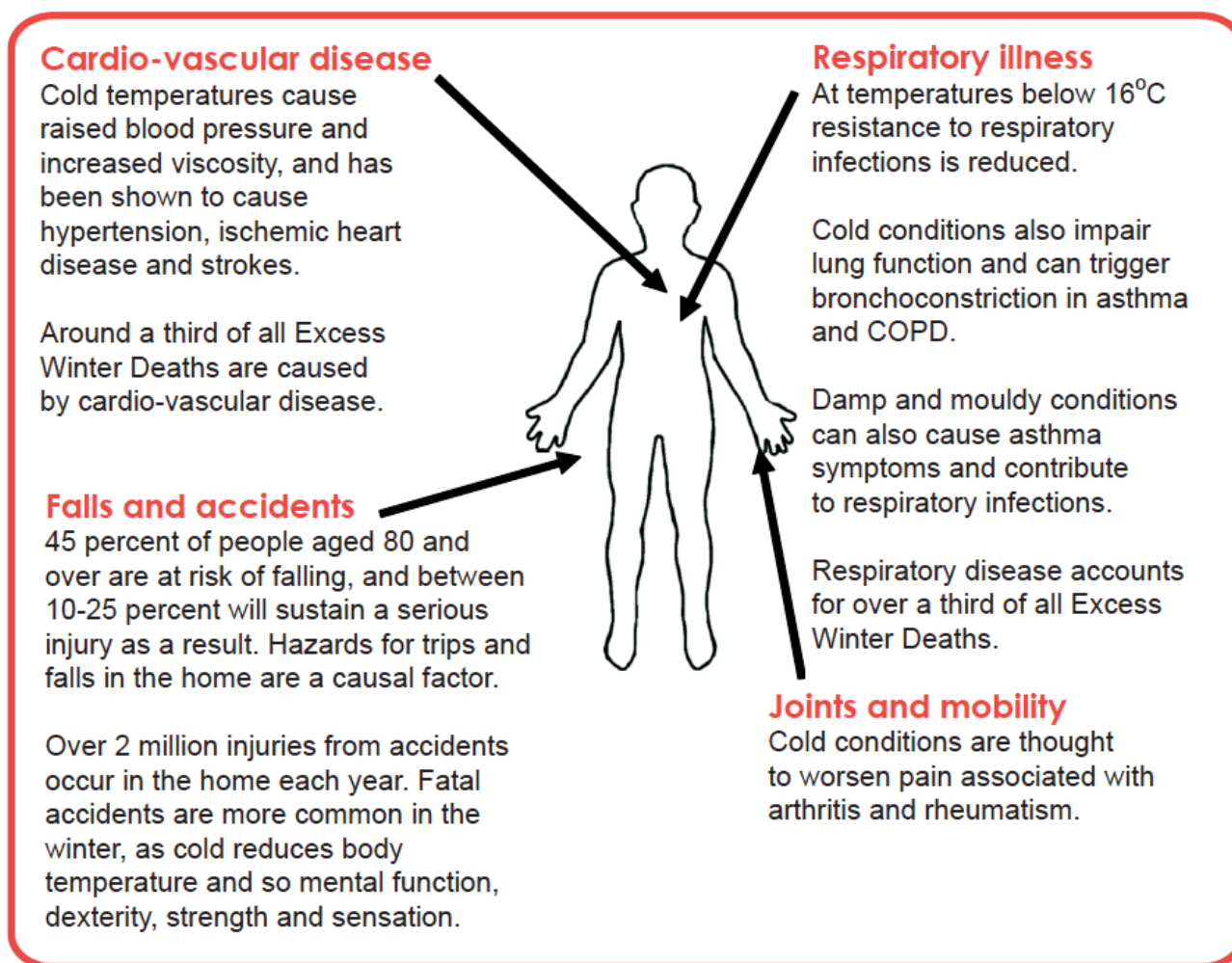
Indicators suggest that health deprivation is high within the Aspley ward. The 'health deprivation and disability' indicator within the Indices of Multiple Deprivation shows that Aspley scores within the worst 20% nationally.<sup>10</sup>

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<sup>9</sup> References to all relevant literature can be found in NCH's Health and Wellbeing report at: [http://www.nottinghamcityhomes.org.uk/improving\\_your\\_home/impact\\_study/health\\_report.aspx](http://www.nottinghamcityhomes.org.uk/improving_your_home/impact_study/health_report.aspx)

<sup>10</sup> Indices of Multiple Deprivation (2010) for Nottingham can be found at: <http://www.nottinghaminsight.org.uk/insight/key-datasets/indices-of-multiple-deprivation-2010.aspx>

Figure 3: Main health implications of poor housing



As part of the Decent Homes programme, every home in Aspley was assessed against the Housing Health and Safety Rating System (HHSRS),<sup>11</sup> which aims to identify any serious risks to health and safety in the home. These are then addressed under the Decent Homes work. The harms are categorised by risk from physiological, psychological, infection or accident hazards. The HHSRS identifies the significance of the hazard, according to the likelihood of harm occurring and the level of harm should the hazard occur. 367 homes in Aspley were identified as having a significant hazard, which would then be addressed during the Decent Homes work. Therefore the outcome for the tenants in these homes is that *the removal of serious hazards will reduce accidents and harms.*

As indicated in Figure 3, cold conditions in the home can have a negative impact on respiratory health. Children's health has been identified as being particularly vulnerable to cold conditions. The World Health Organisation found that children (aged 0-17) living in homes with low quality heating systems showed double the prevalence of respiratory symptoms compared to those in adequately heated homes.<sup>12</sup> This has also

<sup>11</sup> Department for Communities and Local Government (2006) *Housing Health and Safety Rating System* [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/9425/150940.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/9425/150940.pdf)

<sup>12</sup> World Health Organization (2009) Large Analysis and Review of European Housing and Health Status [http://www.euro.who.int/\\_data/assets/pdf\\_file/0007/107476/lares\\_result.pdf](http://www.euro.who.int/_data/assets/pdf_file/0007/107476/lares_result.pdf)

been shown to have an impact on the number of days missed from school.<sup>13</sup> Therefore an outcome for children living in NCH homes where new heating is installed is that there is a *reduction in school days missed as a result of improved respiratory health*.

Poor energy efficiency also has implications for mental health.<sup>14</sup> The main channels for this identified from the health literature and consultation with tenants were increased stress from cold and fuel poverty, and negative mental impacts from recurrent damp and mould in the home. As only a small number of homes were recorded as having recurrent damp and mould in Aspley, this outcome was excluded during the sensitivity analysis. However, the effects of excessively cold homes, experienced by all tenants living in properties with single-glazed windows and old heating systems, was significant. The anticipated outcome is *improved mental health as a result of reduction in cold conditions*.

**“I was just miserable, you know, because it was cold and damp and then you’d have to be putting on loads of clothing and things like that, you know, it was like miserable and gloomy I should say.”**

*NCH tenant*

A possible unintended impact identified during the consultation is the potential for negative mental or emotional wellbeing effects as a result of the stress of significant renovation work being carried out in the home. However, a review of customer satisfaction surveys completed by tenants in Aspley following the work indicated that only a very small number of tenants reported a negative experience of the work. In addition, other research suggests that this negative impact only occurs for the duration of the work in the home, and is quickly replaced by positive feelings once the work is completed.<sup>15</sup> For these reasons, this outcome was excluded as not being material.

In addition, a further unanticipated outcome that tenants highlighted during the consultation was the general improvement in how they felt about their home and neighbourhood. Tenants commented that it made the area look cleaner and feel valued. This results in tenants valuing the property as ‘home’, and therefore being less inclined to look for other, better quality accommodation. This results in *increased community stability*, which is a positive outcome for both individuals and their families, and the communities in which they live.

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<sup>13</sup> Howden-Chapman P et al. (2007). Effect of insulating existing houses on health inequality: cluster randomized study in the community. *British Medical Journal*, 334:434-435.

<sup>14</sup> World Health Organisation (2011) *The Environmental Burden of Disease Associated with Inadequate Housing: Housing Quality and Mental Health*.  
[http://www.euro.who.int/data/assets/pdf\\_file/0003/142077/e95004.pdf](http://www.euro.who.int/data/assets/pdf_file/0003/142077/e95004.pdf)

<sup>15</sup> Critchley, R. Gilbertson, J., Green, G. and Grimsley, M. (2004) *Housing investment and health in Liverpool*. Centre for Regional Economic and Social Research, Sheffield Hallam University

**“I’ve heard remarks, ‘look at our lovely windows now’. I walk around the estates, and they do look much much better. And sometimes you don’t know if they’re privately owned or NCH owned – and that’s good for the areas.”**

*Aspley tenant*

The final outcome for NCH tenants and communities is as a result of the chance of finding employment through the Apprenticeship schemes run in conjunction with the Decent Homes programme. NCH has committed to taking on one apprentice for every £1m spent on the Decent Home programme (the ‘One in a Million’ scheme). NCH also work with a social enterprise based in Aspley, which recruits apprentices from amongst long-term unemployed people in the Aspley area. This therefore creates an *increase in employment and training* amongst people living in Aspley.

Finally, the outcomes for other stakeholders are considered. A number of the changes experienced by NCH tenants also have an impact on these other stakeholders. For example, individual households benefit from the increase in security and resulting reduction in burglaries, avoiding suffering the invasion of their home, any damage caused and value of property lost. However, the police also incur a resource burden from dealing with burglaries. Therefore the *reduction in the number of cases of domestic burglary reduces resource burden on the police.*

Similarly, as well as tenants benefiting from improved health as a result of the removal of hazards, the NHS benefits as the *removal of serious hazards reduces number of accidents and harms requiring treatment.* Treatment costs are also reduced as a result of the *reduction in number of cases of children with asthma*, and the *reduction in number of cases of depression resulting from cold conditions.* Each of the health benefits for tenants set out above therefore also has a corresponding benefit for the health service, in terms of reduced treatment costs.

One of the hazards addressed during Decent Homes is the risk of fires at home. All properties with interior improvements are also fitted with a hard-wired smoke detector and alarm. An outcome regarding the impact on the number of domestic fires was considered. However, after consulting local data on accidental dwelling fires in Aspley, the number was found to have increased over the period from 2007 to 2012, rather than the decrease that would be anticipated as a result of fitting smoke detectors. It therefore appears that other factors, such as lifestyle and activities of tenants (e.g. smoking and cooking habits), have outweighed the impact of fitting smoke detectors. This outcome was therefore excluded as immaterial.

The next stakeholder considered is One Nottingham, the Local Strategic Partnership, which represents the city as a whole. One Nottingham is responsible for (amongst other things) the city’s carbon reduction strategy and local economic development. One Nottingham has set itself challenging targets in reducing energy use and carbon emissions, even though carbon emissions per capita in Nottingham are already comparatively low compared to those in other major cities. Work to improve the energy efficiency of council housing stock will play an important role in meeting these targets, as over one third of the city’s emissions are from domestic housing, and council housing stock accounts for a quarter of properties in the city.



The improvement in energy efficiency and *reduction in carbon emissions* is identified as a positive outcome for One Nottingham, as the accountable body for Nottingham's carbon reduction targets.

**“We need to move Nottingham into a lower carbon future, and live within our environmental limits. This has implications for how we deliver every action programme, with a need to reduce carbon emissions over time and respond to climate change”**

*One Nottingham, Sustainable Communities Strategy*

An unintended and negative consequence on the environment is the increase in waste generated by the refurbishment work. For example, the main windows contractor produced over 2,000 tonnes of waste from 2009-11. However, NCH and its constructor partners have in place site waste management plans outlining waste minimisation through segregation to reduce the amount of landfill and increase the recycling of materials to be used elsewhere. 95% of all waste from the Decent Homes work is recycled, therefore very little goes to increase landfill. Because this level of waste is fairly small, it was therefore not considered to be a material outcome in the final SROI calculations.

Nottingham's Decent Homes programme is a large capital development project for the city, with a total budget of £187m. It therefore represents a significant financial injection into the construction industry, along with associated impacts such as increased employment, training and the stimulation of the local economy.

One Nottingham aims to promote and support the city's economic prospects, ensuring that its citizens benefit from its wealth creation. Thus a positive outcome for One Nottingham from the Decent Homes programme is the *boost to the local economy* that this investment brings.

**“We also need to maintain the city's economic competitiveness and strength, especially in this testing time of recession... But we must also connect more people into the benefits of Nottingham's economy.”**

*One Nottingham, Sustainable Communities Strategy*

The final stakeholder to consider is the state. The Department for Communities and Local Government is responsible for funding the Decent Homes programme nationally, and therefore the inputs for the programme in Nottingham are assigned to the state. Other outcomes for the state considered were as a result of the increase in employment, reducing the amount of benefits paid to those previously unemployed and increasing the tax take from their salaries. However, given the scale of these outcomes in comparison with others including in the social return, these outcomes were excluded in the sensitivity analysis as not being material.

The final set of outcomes included in the social return analysis are set out in Table 1 below.

Table 1: Final outcomes set included in SROI analysis

Stakeholders	Outcomes	
NCH tenants	NCH households with Secured by Design windows	Increase in security of properties reduces number of burglaries
	NCH tenants in properties with Secured by Design windows	Improved emotional wellbeing as a result of reduction in fear of crime
	NCH households with A-rated windows and/or boilers	Increase in thermal efficiency of properties (from new windows and heating) reduces heating bills
	NCH households where major hazard removed	Removal of serious hazards reduces accidents and harms
	Children living in NCH properties	Reduction in school days missed as a result of improved respiratory health
	NCH adult tenants living in homes with 'excess cold' conditions	Improved mental health as a result of reduction in cold conditions
	NCH households	Increased community stability
	NCH apprentices	Increase in employment and training
<b>Nottinghamshire Police</b>	Reduction in number of cases of domestic burglary reduces resource burden on the police	
<b>Nottingham City NHS</b>	Removal of serious hazards reduces number of accidents and harms requiring treatment	
	Reduction in number of cases of children with asthma	
	Reduction in number of cases of depression resulting from cold conditions	
<b>One Nottingham</b>	Reduction in carbon emissions	
	Boost to the local economy	

### 3. Evidencing the outcomes

In regards to the duration of each outcome, the decision was taken to measure the impact over the five years following the housing improvements. Although the life expectancy of the capital investments is much longer than this period (for example, boilers are expected to have a serviceable lifetime of 15 years, whilst the lifecycle of windows is longer at 30 years), the guidance for SROI makes clear that the duration of the benefits of capital investments is not necessarily the same as the life expectancy of those elements. Over such long periods of time, there would be not only be some level of drop-off in the outcome, but attribution drop-off would certainly be high due to changing contextual circumstances and the role of other stakeholders in affecting the long-term trajectory of measured outcomes. Therefore, in line with the principle of SROI of 'do not over-claim', the duration of each outcome was estimated up to a maximum of five years into the future.

The following sections set out in detail how each outcome was measured, the financial value assigned, and also explains how appropriate figures for deadweight, displacement, attribution and drop-off were arrived at.

#### Outcomes for NCH tenants

##### *Increase in security of properties reduces number of burglaries*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH households with Secured by Design windows	2,972
<b>Indicator</b>	Change in total annual dwelling burglaries 2007 - 2012	88
<b>Financial proxy</b>	Socio-economic costs of burglary to the individual	£4,239
<b>Deadweight</b>	City-wide reduction in burglary 2007-12	32%
<b>Displacement</b>	Tenants' own investment in windows	10%
<b>Attribution of others</b>	Reduction in non-forced entry	11%
<b>Drop off</b>	Capital depreciation of windows plus attribution drop-off	30%

Secured by Design windows and/or doors were fitted in 2,972 NCH properties in Aspley, thus making these homes more secure.

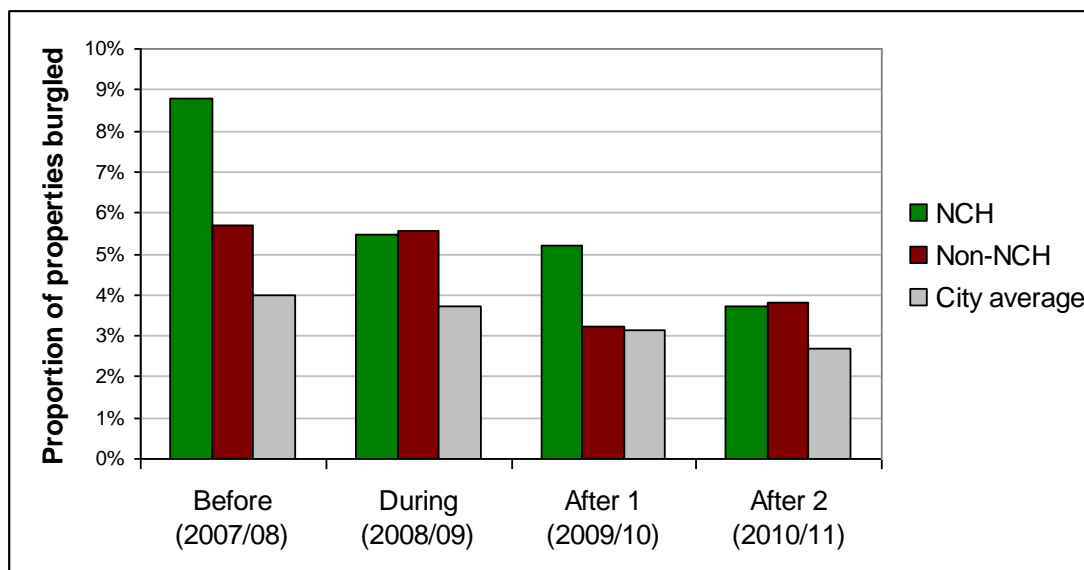
The outcome of reduced burglary and attempted burglary of NCH properties in the Aspley ward was able to be directly measured using police data collected under the Home Office Counting Rules (HOCR) codes for recorded crime. Thus data on the number of burglaries to a dwelling and aggravated burglary to a dwelling were made available through joint research with the Nottingham Crime and Drugs Partnership.

Statistical analysis of the data compared number of burglaries from the financial year before the work was started (i.e., March 2007 to April 2008) with numbers from the

most recent financial year following the work (2011/12). In order to establish the deadweight for this outcome, changes to burglary in secure NCH properties were also compared against city-wide levels and trends over the same period, properties within the same estates that were not owned by NCH (largely privately owned) and NCH properties which had not undergone DECENT HOMES work.

Before the Secure work took place, NCH properties in Aspley had a higher level of burglaries than non-NCH properties (8.8 percent of NCH properties experiencing burglaries, compared to 5.7 percent of non-NCH properties, see Figure 4). Since the work was completed, both NCH and non-NCH have experienced a significant reduction in burglaries, although NCH properties have seen a larger reduction in the number of burglaries, with 88 fewer burglaries per year (comparing 2008/09 to 2011/12) compared to 21 fewer burglaries to non-NCH properties per year. This represents a 58% reduction in the level of burglary to NCH properties in the Aspley area. The Secure programme therefore appears to have reduced the difference between the proportion of NCH and non-NCH properties that are burgled.

Figure 4: Change in number of burglaries in Aspley



Across Nottingham city as a whole during this period, the total number of burglaries was reduced by 32 percent. The result demonstrates that the reduction in burglaries in the intervention area over the period was significantly greater than the overall reduction in burglaries across the city as a whole. The average reduction in burglary across the city is taken as the deadweight for this outcome, i.e. what would have happened anyway due to general trends in burglary reduction.

The Home Office have carried out work to estimate the total social and economic cost of a burglary to individual victims of crime (therefore a suitable proxy for the value of reduced burglaries to tenants). This includes only the costs to the individual, not to the police or state for dealing with the crime. For example, this includes the cost of the emotional and social impact, lost output, and health services. The total social and

economic cost of a burglary is estimated at £3,268.<sup>16</sup> This figure is updated for inflation to 2011 prices, and used as the financial value to tenants of the 88 fewer burglaries a year to NCH properties.

Clearly other organisations and activities, such as crime reduction initiatives by the police, will also have an impact on the level of burglaries in the area. Therefore the outcome is not fully attributable to NCH. Data on the method of entry for each burglary is used to determine attribution. Reduction in burglaries via forced entry are attributed to NCH, i.e. where target hardening of the properties made it physically harder for burglars to gain entry. On the other hand, the reduction in burglaries via non-forced entry (e.g. where the property is left unsecured) is likely to be attributable to others such as the police and residents themselves. The reduction in non-forced entry accounts for 11% of the overall reduction, and therefore this is included as the figure for attribution to others.

NCH’s investment in new windows and doors may have displaced tenants’ own investment in these properties, which they may have otherwise made out of their own resources. The proportion of tenants who have undertaken their own work is measured using refusal rates for the Decent Homes programme, as a large proportion of refusals are because tenants do not want NCH to replace elements that they have already upgraded in their homes. The refusal rate is taken from NCH’s programme management data and is 10% for the windows programme.

The new windows will continue to protect against forced entry over the lifespan of those windows. Therefore the duration of this outcome is set at the maximum five years of the impact evaluation. However, capital depreciation of the windows is included as the value of the drop-off in this outcome over this period. This is calculated based on a straight-line depreciation to zero value over the lifespan of the windows, which is 30 years (according to NCH asset management information). The drop-off rate (of capital depreciation) is 3.3 percent per year. Also included in the drop-off is some level of attribution drop-off, as other factors such as crime reduction initiatives, changing socio-economic circumstances etc. will affect the initial reduction attributed to the new windows. Total drop-off is set at 30 percent for this outcome.

*Improved emotional wellbeing as result of reduction in fear of crime*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH tenants in properties with Secured by Design windows	7,223
<b>Indicator</b>	Change in number of tenants reporting that they feel safe at home alone after dark	433
<b>Financial proxy</b>	Cost of a burglar alarm	£684
<b>Deadweight</b>	Reduction in % all NCH tenants who think theft/burglary is a major issue	6%

<sup>16</sup> Home Office (2005) *The total social and economic costs of crime against individuals and households 2003/04*, Home Office Online Report 30/05

<b>Displacement</b>	Tenants' own investment in windows	10%
<b>Attribution of others</b>	Reduction in non-forced entry	11%
<b>Drop off</b>	Capital depreciation of windows	30%

This reduction in crime is recognised by tenants, who indicated that as a result they felt safer and were less afraid of crime. NCH's annual Standardised Tenant Satisfaction Survey (STATUS) is completed by a statistically significant sample of tenants in each ward on an annual basis. This showed that, before the DECENT HOMES work started, 46% of the Aspley tenants surveyed in 2008 said that burglary/theft was a 'very' or 'fairly' big problem. By 2009, the proportion of tenants that thought this had decreased to 37%. As a result, the proportion of tenants who felt safe in their home alone after dark increased from 31% in 2008 to 37% in 2011. Applying this to the number of tenants in the Aspley ward in properties with new secure windows means that 433 tenants feel safer in their home since the work was completed.

This was also supported by telephone interviews with 25 tenants in Aspley. When tenants who were interviewed were asked about how safe they felt in their homes alone during the night before the windows were replaced, around a third of respondents said that they felt 'a bit' or 'very' unsafe. A number of tenants commented that they felt that the old single glazed windows were neither robust nor secure, with several tenants expressing similar views as captured by one tenant:

**“With the other windows, you could just pull them out.”**

*Aspley tenant*

Since the windows were replaced with the new Secured by Design units, all of the tenants who had stated that they felt unsafe with the old windows indicated that they felt safe now that the windows have been replaced. A number commented that they “feel safer” or “more secure” now. Views included:

**“I feel a lot safer and warmer. The deadlocks make me feel very safe.”**

**“[The windows] are very important – makes you feel safer.”**

*Aspley tenants*

The financial proxy for this outcome is based on tenants' willingness to pay for a reduction in fear of crime. Installing a security alarm would be an alternative way of achieving a reduction in fear of crime, and one that has value in the market. Thus financial proxy selected for the reduction in fear of crime is the average cost of a security alarm. According to a survey by Which? magazine, the average cost of a burglar alarm in 2008 was £625;<sup>17</sup> this figure is updated for inflation to 2011 prices, giving a total financial proxy of £684.

The deadweight for this outcome accounts for the overall reduction in tenants' perception of theft/burglary as a major issue across all NCH tenants. This takes into

<sup>17</sup> Survey of 281 suppliers in Which? magazine, August 2008

account general changes in perception of burglary across the same period, therefore removing wider trends to isolate just the changes that NCH is responsible for in the Aspley area. According to NCH's annual customer satisfaction surveys, the proportion of tenants who thought that theft/burglary was a major issue decreased from 16 percent in 2008 to 10 percent in 2012; this 6 percent overall decrease is included as the deadweight.

The figures and reasoning for duration, displacement, attribution and drop-off of this outcome are the same as those for the previous outcome (reduction in burglaries).

*Increase in thermal efficiency of properties (from new windows and heating) reduces heating bills*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH households with A-rated windows and/or boilers	3,094
<b>Indicator(s)</b>	Number of households fitted with double-glazed windows	2,972
	Number of households fitted with new heating systems	1,741
<b>Financial proxy(s)</b>	Cost saving in energy bill from replacing timber single glazing with PVC double glazing	£136
	Cost saving in energy bill from replacing G rated boiler with A rated	£300
<b>Deadweight(s)</b>	National proportion of Local Authority properties with more than half of the home double glazed	4.6%
	National proportion of Local Authority properties with condensing combi-boiler	22.2%
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	N/A	
<b>Drop off</b>	Capital depreciation of windows and heating	6.6%

Increasing the efficiency with which energy is used to generate heat by upgrading heating systems, and improving the retention of heat through insulation measures (including double glazed windows and loft insulation) leads to a reduction in the amount of energy required to heat the home to an adequate living temperature. This therefore reduces fuel bills, and consequently helps to reduce fuel poverty.

The quantity of change in energy efficiency is equal to the number of households that have received energy efficiency improvements; 2,972 homes were fitted with double-glazing and 1,741 with new heating systems (some properties may have had both,

giving a total number of households of 3,094). The indicator is broken down by windows and heating installations separately, because different proxy values are applicable to each. The Glass and Glazing Foundation provide a cost calculator<sup>18</sup> to estimate the energy cost savings from replacing timber-framed single glazed windows with A-rated double glazed models, for a range of property types. The breakdown of types of properties in Aspley with new windows (e.g. detached house, terrace or bungalow) was inputted into the calculator to provide a weighted average saving across all these properties of £136 per year. Similarly, the Energy Saving Trust (EST)<sup>19</sup> provide an estimate of annual energy cost savings of £300 as a result of replacing an old G-rated boiler with an A-rated boiler, as was done under the DECENT HOMES programme.

Tenants interviewed as part of four case study properties receiving energy upgrades confirmed that fuel poverty was an issue for them, and that the measures had helped to decrease their fuel bills.

**“I tended to live more in one room just to keep the heat in that room because I was so worried about the bills... It seems with having the single-glazed windows they didn’t keep the warmth in and to me that was the most important thing. ...I used to have my bedroom radiator on all the time, [since the new heating and windows] I have not had it on once even in the winter, it is off twenty four hours a day, turned off... I pay [my fuel bills] by direct debit monthly, I am in credit”**  
*Aspley tenant*

The deadweight is taken as the national average proportion of Local Authority owned properties where more than half of the house is double glazed, or where they have a condensing combi-boiler fitted.<sup>20</sup> This provides an estimation of what might have been installed anyway, without the Decent Homes programme, based on the national average standard of glazing and heating in other Local Authority owned properties.

The displacement figure is again based on how much NCH’s investment may have displaced tenants’ own investment in heating and windows. According to NCH’s programme management data, the combined refusal rate for windows and heating is 7 percent, giving an estimate of what proportion of the investment would have been carried out by tenants themselves.

NCH is assigned full attribution for this outcome, as the organisation is fully responsible for the installation of new windows and heating and there are no other stakeholders that can be credited with a share of the outcome.

The energy savings are based on annual savings, and will continue over the five years of the benefit period. However the drop-off accounts for the combined capital depreciation

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<sup>18</sup> Glass and Glazing Federation (2012) Energy Saving Calculator <http://www.ggf.org.uk/energy-savings-calculator>

<sup>19</sup> Energy Saving Trust, see <http://www.energysavingtrust.org.uk/Home-improvements-and-products>

<sup>20</sup> Figures taken from the English Housing Survey (2009) <https://www.gov.uk/government/publications/english-housing-survey-2009-housing-stock-summary-statistics-2009>



of windows and boilers. Boilers have a shorter lifespan than windows at 15 years, and therefore the depreciation rate is higher at 6.6 percent.

*Removal of serious hazards reduces accidents and harms*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH households where major hazard removed	367
<b>Indicator(s)</b>	Estimated reduction in number of EXTREME harms from physiological, psychological, infection and accident hazards	0.3
	Estimated reduction in number of SEVERE harms	0.85
	Estimated reduction in number of SERIOUS harms	5.02
	Estimated reduction in number of MODERATE harms	13.14
<b>Financial proxy(s)</b>	Year's lost wages (calculated from median weekly earnings of employees in Nottingham)	£25,012
	6 month's lost wages	£12,506
	Month's lost wages	£1,924
	Week's lost wages	£481
<b>Deadweight</b>	National average HHSRS scores (taken into account in calculation)	Various
<b>Displacement</b>	Tenants' own investment in interior improvements	12%
<b>Attribution of others</b>	Improvement in general health outcomes as a result of all other interventions (IMD)	14%
<b>Drop off</b>	Some outcome drop-off with capital depreciation, plus attribution drop-off as other lifestyle choices affect home safety	20%

Under the Decent Homes programme every property is assessed against the Housing Health and Safety Rating System (HHSRS), which identifies any aspects of housing conditions which may give rise to risks to health and safety. The property is assessed for physiological hazards (e.g. damp and mould, asbestos, excess cold conditions, carbon monoxide risks), psychological hazards (space, security, light and noise), infection hazards (e.g. hygiene, sanitation) and accident hazards (e.g. falls, burns, electric shocks). Trained surveyors rate each hazard according to how likely the hazard is to occur, multiplied by a spread of the expected severity of the injury should that harm occur.

The most common hazards identified in properties in Aspley are excess cold (in 2,972 properties), potentially leading to both cardiovascular and respiratory illness (see Figure 3), risks from electricity (124 properties) and hot surfaces – for example, due to unsafe positioning of cooker (in 112 properties).

The survey results provide an indicator of the likely improvement in health outcomes as a result of addressing hazards identified in properties through the DECENT HOMES work. The estimations of the number of incidents of harm avoided by removing these hazards are modelled from the HHSRS data based on the methodology developed by BRE and University of Warwick.<sup>21</sup> The essential premise is to compare the number of harms that were likely to occur given the HHSRS score prior to the Decent Homes improvement works, with the number of harms likely to occur given the HHSRS score after the works.

Using figures from the BRE report, the difference was calculated between the average HHSRS scores for properties with the type of hazards identified in properties in Aspley, with the national average scores as set out in the HHSRS Operating Guidance. This provided an estimation of the number of harms that were avoided as a result of the improvements to the properties, which were categorised as to whether the hazard is likely to have an extreme, severe, serious or moderate impact on health. Because the financial proxy varies with the severity of the harm, the number of harms avoided are separated out into these four categories.

This analysis resulted in the following outcome indicators for Aspley:

- 7 accidents requiring medical attention avoided by addressing hazards from flames/hot surfaces
- 6 accidents requiring medical attention avoided by addressing hazards from electricity
- 2 medical treatments avoided from respiratory illness linked to damp and mould
- 2 injuries avoided from falls
- One injury avoided from structural hazards
- One incidence of harm avoided by treating excess cold conditions

This quantitative evidence is supported by information gathered from tenants for health-related case studies, an excerpt of which is given below:

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<sup>21</sup> Nicol, S., Roys, M., Davidson, M., Summers, C., Ormandy, D. and Ambrose, P. (2010) *Quantifying the cost of poor housing*. BRE Information Paper 16/10

**“All of us used to have lots of colds... health-wise it was really bad I’d say ... Because I have lower back pain anyway, so with it being cold it’s like my bones couldn’t get warm and I was constantly at the doctor’s and on medication and things like that, so I felt it really bad.**

**I think I had a little gas leak at one time, I had to go to the doctor’s and what it was, it was a little gas leak...**

**I can feel the difference, even though I know I can feel the pain but it hasn’t been as bad as before I had the windows done... If it’s anything to do with colds or flu I haven’t been to the doctor’s for that and the children haven’t been to the doctor’s for that”**

To ensure that the financial proxy is appropriate to each stakeholder, the measured outcomes for tenants’ health are valued here for the tenants themselves, i.e. the value that they would place on good health. The value of health outcomes in terms of cost savings to the health service is included under a separate outcome for the NHS.

The majority of these incidents are in the ‘moderate’ harm category (just over 13). The financial proxy is therefore taken as a week’s lost wages due to recovery from injury, valued at the average weekly wage for Nottingham of £481.<sup>22</sup> ‘Serious’ injuries are proxied by a month’s lost wages, ‘severe’ injuries by six month’s lost wages and ‘extreme’ injuries by a year’s lost wages.

The above calculations already take into account the deadweight, by comparing the number of hazards in Aspley properties with the national average number of hazards that would be expected in a typical home. Therefore the number of harms avoided only includes those over and above the number expected in the average home.

Most of the reduction in harms can be directly attributed to NCH as result of removing the hazards in these homes. However, other agencies (such as the health service) may well be responsible for general improvements in health outcomes over this period, which may contribute to some of these improvements. To take this contribution into account, the improvement in health outcomes in general over the period, as measured by the change in the health outcome indicator in the Indices of Multiple Deprivation (IMD) between 2007 and 2010, is included as the proportion of attribution to other health service providers. This accounts for 14 percent of the attribution.

Displacement of tenants’ own investment in improving their homes is set at 12%, the average refusal rate of all Decent Homes works (including internals such as kitchens and bathrooms).

The HHSRS Operating Guidance states that the likelihood rating given as part of the overall score represents the probability of an occurrence of harm in the 12 months following the assessment. Therefore, it is assumed that addressing the causes of the

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<sup>22</sup> Median weekly wage in Nottingham (2010), see <http://www.nottinghaminsight.org.uk/IAS/dataviews/tabular?viewId=1128&geold=1&subsetId=>

harm would reduce the number of incidents of harm by the same number each year, for as long as the installation continues to be effective in addressing the hazard. The number of incidents of harm and costs avoided can thus be accumulated over the five years following the intervention. However, a drop-off of 20 percent is included to account, firstly, for the depreciation of internal improvement; and secondly, for attribution drop-off as the way in which the home is used (i.e. whether it is maintained at safe standards) or other lifestyle factors that also affect health gradually outweigh the effect of housing improvements.

### *Reduction in school days missed as a result of improved respiratory health*

Outcome summary		Quantity/value
<b>Stakeholders</b>	Children living in NCH properties with asthma	480
<b>Indicator</b>	Reduction in school days missed as a result of improved respiratory health	506
<b>Financial proxy</b>	Cost of a day's private tuition	£120
<b>Deadweight</b>	National improvement in number of people with asthma in the UK	0
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	N/A	
<b>Drop off</b>	Capital depreciation of windows and heating	6.6%

A World Health Organization (WHO) study in 2009 found that children showed double prevalence for respiratory problems in homes with low-quality heating systems.<sup>23</sup> This is potentially a large impact, as asthma accounts for the majority of respiratory symptoms in children. The prevalence of asthma is increasing, with the UK having one of the highest prevalences of asthma<sup>24</sup> and central England (which includes Nottingham) having the highest prevalence within the UK at 21%.<sup>25</sup>

The WHO provides a method for estimating the burden of disease as a result of poor housing conditions.<sup>26</sup> This provides a formula for the 'population attributable factor'<sup>27</sup> i.e. the proportion of the disease that is created by the hazardous factor, taking into account the relative risk index of the effect of poor heating on respiratory illness (i.e. twice the prevalence) and the proportion of housing with poor heating systems. According to this formula, 34 percent of asthma cases in Aspley are as a result of poor heating systems. There are an estimated 2,283 under 18 year old living in NCH

<sup>23</sup> WHO (2009) *Housing and Health in Europe - The WHO LARES project*. Routledge, New York.

<sup>24</sup> The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee (1998) 'Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC'. *The Lancet*, Volume 351, Issue 9111, pp.1225-1232

<sup>25</sup> Joint Health Surveys Unit (2002) *The Health of Young People*. Stationery Office, London  
<http://www.archive2.official-documents.co.uk/document/deps/doh/survey02/hcyp/hcyp06.htm>

<sup>26</sup> WHO (2011) *Ibid* 14

<sup>27</sup> A more detailed explanation of the population attributable factor is given in Appendix 2

properties in Aspley, and if 21% of these children suffer from asthma (using the regional prevalence rate above), there are an estimated 480 cases of asthma amongst children in NCH properties in asthma. Applying the 'population attributable factor' to this total number gives 164 cases of childhood asthma that are caused by poor heating, and therefore improved when the heating systems are upgraded.

A survey found that children on average miss between 2.5-3 days a week off school a year as a result of asthma.<sup>28</sup> Therefore, multiplying the midpoint of this figure by the reduction in number of cases of asthma as a result of heating improvements gives a total of 481 days of school that are no longer missed.

A financial proxy for the value of missed school for children is given by the amount that parents are willing to pay for private tuition of £20 an hour,<sup>29</sup> reflecting the value of that education. Assuming that a usual school day is six hours, this gives a total valuation of the avoidance of missed school days resulting from these 164 fewer asthma cases of £54,120 per year.

The deadweight for this outcome would be given, for example, by the rate at which asthma outcomes are improving nationally i.e. accounting for how much of this outcome would have been achieved anyway. However, it appears that nationally asthma rates are actually getting worse, with the number of people suffering from asthma increasing by 7 percent between 2002 and 2006.<sup>30</sup> The deadweight is therefore set at zero, as it is assumed that asthma rates would not have improved without NCH's heating improvements, given the national trend.

The figure for displacement takes into account the potential displacement of tenants' own investment in windows and heating, at 7%.

In terms of attribution, the way that the 'population attributable factor' is calculated means that only the cases of asthma that are reduced as a direct result of heating improvements are included in the final outcome indicator. Other causes of asthma (the remaining 66 percent) are attributable and addressed by other stakeholders; however, these are not included in the calculation of the outcome indicator. Therefore NCH can take full attribution for this outcome.

The benefits of the improved heating are anticipated to continue over the five years of the return analysis. The drop-off accounts for the capital depreciation of the heating systems, at 6.6 percent per year.

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<sup>28</sup> Asthma Society of Ireland, see <http://www.asthma-uk.co.uk/asthma4.htm>

<sup>29</sup> Valuation from SROI Network WikiVOIS: 'Willingness to spend: cost of private tutoring at £20 an hour'

<sup>30</sup> NHS Evidence: Clinical evidence summaries

[http://www.cks.nhs.uk/asthma/background\\_information/prevalence](http://www.cks.nhs.uk/asthma/background_information/prevalence)

### Improved mental health as a result of reduction in cold conditions

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH adult tenants living in homes with 'excess cold' conditions	5,038
<b>Indicator</b>	Estimated reduction in number of cases of depression as a result of reducing excess cold	806
<b>Financial proxy</b>	Value of Quality Adjusted Life Year (QALY) for moderate mental health problem	£2,940
<b>Deadweight</b>	Prevalence of depression in the UK	9.7%
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	Contribution of other factors in mental health	50%
<b>Drop off</b>	Attribution drop-off as other factors affect mental health in future years	50%

Excess cold conditions and concerns about fuel costs have a negative impact on mental health. The Nottingham City 2011 Joint Strategic Needs Assessment on adult mental health reported that those with a cold home or experiencing fuel poverty have a four-fold increased risk of depression or anxiety.<sup>31</sup> This is supported by a study that found how reducing fuel poverty improved mental health through a reduction in stress.<sup>32</sup>

A 'population attributable factor' can therefore be calculated for the proportion of cases of depression attributable to cold housing, using the relative risk of depression from cold homes (four-fold) and the number of adult tenants living in properties that were likely to have 'excess cold' conditions before the Decent Homes work started (5,038 adult tenants living in 2,972 properties that previously had single glazing). According to this, 73 percent of cases of depression in Aspley are likely to be affected by cold housing or fuel bills. Given that the current prevalence of depression in the most deprived areas of Nottingham is 22 percent, this suggests that there are 1,108 adult tenants in NCH properties suffering from depression, of which 806 cases are influenced by cold housing or worries about fuel bills.

The financial proxy is based on estimates of the number of Quality Adjusted Life Years<sup>33</sup> (QALY) lost as a result of moderate mental problems, and the value of each QALY. This is described as the 'human cost' of mental illness, i.e. the value to the individual, rather than the costs to the state for treatment etc. In a report by the Sainsbury Centre for

<sup>31</sup> Nottingham JSNA (2011) Adult Mental Health

<http://www.nottinghaminsight.org.uk/insight/jsna/adults/jsna-housing.aspx>

<sup>32</sup> Green, G. and Gilbertson, J. (2008) *Warm Front, Better Health- Health Impact Assessment of the Warm Front Scheme*. Centre for Regional, Economic and Social research, Sheffield Hallam University.

<sup>33</sup> A QALY is a measure of quantity and quality of life as a result of an intervention; it is a product of life expectancy and quality of life, where a year of life in perfect health would score 1

Mental Health<sup>34</sup>, moderate mental health problems are assigned a QALY of 0.098 and the value of each QALY is £30,000. Therefore the human cost of each case of moderate mental health problems is £2,940.

A deadweight is included that takes into account the national prevalence of depression in England, i.e. what level of depression would be expected anyway in the average population. This is set at 9.7 percent.<sup>35</sup>

Displacement accounts for the displacement of tenants' own investment in windows and heating, determined by the refusal rate for works of 7 percent.

As mental health is a complex issue, with many determining factors (such as deprivation, family and social life, physical health and a range of other factors), attribution is assigned equally between NCH and other stakeholders who may influence the above factors. Similarly, due to the variability in mental health status and likelihood that other factors will affect mental health in future years, the attribution drop-off is set at a high rate of 50 percent.

### *Increased community stability*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH households receiving Decent Homes works	3,343
<b>Indicator</b>	Reduction in tenancy terminations of properties in Aspley	52
<b>Financial proxy</b>	Cost of moving home	£1,100
<b>Deadweight</b>	Reduction in average annual turnover of NCH properties 2008-12	7.6%
<b>Displacement</b>	Tenants' own investment in windows, heating or internal improvements	12%
<b>Attribution of others</b>	Role of other factors in decision to move	50%
<b>Drop off</b>	Shorter duration of two years Drop-off of annual capital depreciation	4%

Improvements to the home – not only in terms of increased security, but also wider improvements such as increasing thermal comfort, installing modern kitchen and bathroom facilities and addressing significant issues such as damp and mould – improve tenants' satisfaction with the quality of their property, and improve the connection with the 'house as a home'. According to the annual STATUS survey of tenants, the proportion of tenants who were 'fairly' or 'very' satisfied with the quality of their home

<sup>34</sup> Sainsbury Centre for Mental Health (2003) *The Economic and Social Costs of Mental Illness* [http://www.centreformentalhealth.org.uk/pdfs/costs\\_of\\_mental\\_illness\\_policy\\_paper\\_3.pdf](http://www.centreformentalhealth.org.uk/pdfs/costs_of_mental_illness_policy_paper_3.pdf)

<sup>35</sup> The Health & Social Care Information Centre (2009) *Adult psychiatric morbidity in England, Results of a household survey*

increased from 69% prior to the Decent Homes programme, rising to 76% following the work.

The outcome is that there is increased tenancy stability. This is assessed according to how Decent Homes work affects the number of terminations to tenancies in properties that have been improved. NCH's data on tenancies shows that before the programme started (2008) there were 234 terminations of tenancies each year in Aspley. In the year after the work (2012) this decreased to 182 terminations per year; a decrease of 52 terminations per year.

The financial proxy is selected on the basis that terminating a tenancy and therefore moving to a new home has associated costs, and that tenants who terminate their tenancy must therefore value moving home at least as much as these costs. According to a report by Lloyds TSB<sup>36</sup>, the average cost of moving<sup>37</sup> is £1,100.

The deadweight is accounted for by the change in average annual turnover of NCH properties between 2008 and 2012. Over this period, turnover (the number of properties terminated) decreased by 7.6 percent across all NCH stock.

Only half of the attribution is given as a result of housing improvements, as other factors (such as family size and circumstances, employment, age etc.) also commonly play a role in the decision whether to move.

This outcome is anticipated to last for two years. Although the elements fitted will continue to last longer than two years, the shorter duration of this outcome takes into account the noted tendency for people to adapt to changes in lifestyle, so that after some time earlier improvements to quality of life are now taken for granted.<sup>38</sup> Therefore, it is anticipated that after two years the previous improvements will no longer impact on tenants' decision on whether to stay in their home.

Average capital depreciation of windows, heating, kitchens and bathrooms of 4 percent is included as drop-off.

### *Increased employment and training*

Outcome summary		Quantity/value
<b>Stakeholders</b>	NCH apprentices from Aspley	10
<b>Indicator</b>	Increased number of apprentices	10
<b>Financial proxy</b>	Additional salary for those completing construction apprenticeship over median annual salary for Nottingham	£8,009
<b>Deadweight</b>	Percent of 16-24 year olds on Apprenticeship nationally	1.5%
<b>Displacement</b>	N/A	

<sup>36</sup> Lloyds TSB (2012) [http://www.lloydsbankinggroup.com/media/pdfs/LTSB/2012/2701\\_Cost.pdf](http://www.lloydsbankinggroup.com/media/pdfs/LTSB/2012/2701_Cost.pdf)

<sup>37</sup> This only includes removal costs, as other costs relate to home owners rather than tenants e.g. mortgage costs and Stamp Duty

<sup>38</sup> Layard (2011) *Happiness: Lessons from a new science*



<b>Attribution of others</b>	Contribution of other stakeholders to Apprenticeship programme e.g. recruitment social enterprise and local colleges	50%
<b>Drop off</b>	Attribution drop-off over time	20%

The opportunity for employment and training for residents in Aspley brings the beneficial outcomes associated with Apprenticeships, including improved career opportunities, spending power through the wage earned, and social benefits from working. Ten apprentices were recruited from the Aspley area through a local social enterprise. The value of this outcome is the increased earning power over their career of someone who has completed an Apprenticeship, compared to someone with a lower level of qualification. Evidence shows that those who complete an Apprenticeship in construction earn on average 32% more than those without an Apprenticeship over their working career.<sup>39</sup> Applied to the average wage in Nottingham,<sup>40</sup> those completing an Apprenticeship will earn £8,009 a year more than those without the qualification.

Deadweight is accounted for by the proportion of young adults (aged 16-24) employed nationally on Apprenticeship schemes, which is currently 1.5 percent. This represents the chance that these apprentices may have found employment on another Apprenticeship scheme.

Although NCH is responsible for setting up the Apprenticeship scheme, other stakeholders such as the social enterprise that recruits the apprentices, and the local colleges that provide the learning side of the apprenticeship, also contribute to the outcome. Therefore half of the attribution is assigned to NCH.

The duration of the beneficial outcomes of completing an Apprenticeship has been shown to continue over the rest of the working career, and thus the duration of this outcome is measured year on year over the five-year timeframe for the return analysis. However, drop-off is accounted for in later years as the initial accountability for the increase in earning power as a result of the Apprenticeship is reduced over time. Attribution drop off of 20 percent is assigned, so that little attribution to NCH remains after five years.

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<sup>39</sup> McIntosh (2007) *A Cost-Benefit Analysis of Apprenticeships and Other Vocational Qualifications*

<sup>40</sup> Ibid. 21

## Outcomes for Nottinghamshire Police

### *Reduction in number of cases of domestic burglary reduces resource burden on the police*

Outcome summary		Quantity/value
<b>Stakeholder</b>	Nottinghamshire police	1
<b>Indicator</b>	Change in total annual dwelling burglaries 2007 - 2012	88
<b>Financial proxy</b>	Cost of burglary to police	£1,198
<b>Deadweight</b>	City-wide reduction in burglary 2007-12	32%
<b>Displacement</b>	Tenants' own investment in windows	10%
<b>Attribution of others</b>	Reduction in non-forced entry	11%
<b>Drop off</b>	Capital depreciation of windows	30%

The change in the number of burglaries on the Aspley estate is also taken as the indicator for the reduction in resource burden on the police. Each burglary that is avoided due to the security measures saves police resources in terms of the call out cost to the property and the follow up cost of pursuing the responsible criminal party. This frees up resources for police to focus on other aspects of their role, and is especially pertinent in a time of cut backs across the public sector including the police. The burglary data discussed above shows that there are 88 fewer burglaries a year to NCH properties in the Aspley area.

The cost of dealing with a burglary is reported by 'Secured by Design', the organisation run by the Association of Chief Police Officers. According to an 'Activity Based Costing' report by Northamptonshire police, the total resource cost for the police of dealing with a burglary is £1,198<sup>41</sup> and this is therefore taken as the financial proxy for this outcome.

The deadweight, displacement attribution and drop-off are the same as for the first outcome, the benefit to tenants in terms of reduced burglaries, given that the indicator is measured using the same approach.

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<sup>41</sup> Secured by Design (2009/10)

[http://www.securedbydesign.com/pdfs/SBD\\_Carbon\\_Reduction\\_and\\_Cost\\_Efficiency\\_Saving\\_Model.pdf](http://www.securedbydesign.com/pdfs/SBD_Carbon_Reduction_and_Cost_Efficiency_Saving_Model.pdf)

## Outcomes for Nottingham City NHS

### *Removal of serious hazards reduces number of accidents and harms requiring treatment*

Outcome summary		Quantity/value
<b>Stakeholder</b>	Nottingham City NHS	1
<b>Indicator(s)</b>	Estimated reduction in number of EXTREME harms from physiological, psychological, infection and accident hazards	0.3
	Estimated reduction in number of SEVERE harms	0.85
	Estimated reduction in number of SERIOUS harms	5.02
	Estimated reduction in number of MODERATE harms	13.14
<b>Financial proxy(s)</b>	Cost of treatment of extreme harm	£50,000
	Cost of treatment of severe harm	£20,000
	Cost of treatment of serious harm	£1,500
	Cost of treatment of moderate harm	£100
<b>Deadweight</b>	National average HHSRS scores (taken into account in calculation)	Various
<b>Displacement</b>	Tenants' own investment in interior improvements	12%
<b>Attribution of others</b>	Improvement in general health outcomes as a result of all other interventions (IMD)	14%
<b>Drop off</b>	Some outcome drop-off with capital depreciation, plus attribution drop-off as other lifestyle choices affect home safety	20%

The indicators for changes to health outcomes for the NHS are the same as those set out above for tenants. However, the quantity of change is here assigned financial proxies that account for cost savings to the NHS from reduced medical treatments, either at the local GP or hospital.

The cost savings from avoided incidents of harm from the HHSRS data are based on the representative costs calculated in the BRE report<sup>42</sup>, i.e., £50,000 for treating an extreme harm, £20,000 for a severe harm, £1,500 for a serious harm, and £100 for a moderate harm.

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<sup>42</sup> Ibid 21

These costs were totalled across all the hazards and all the classes of harms, giving a total estimated cost saving to the NHS in Nottingham as a result of addressing all the serious hazards identified in NCH properties in Aspley. This gave a total cost saving of £40,715.

As the method for calculating the indicator is the same as for the outcome for tenants above (removal of serious hazards reduces accidents and harms), the calculations and reasoning for deadweight, displacement, attribution and drop-off are the same as for the earlier outcome.

*Reduction in number of cases of children with asthma*

Outcome summary		Quantity/value
<b>Stakeholder</b>	Nottingham City NHS	1
<b>Indicator</b>	Estimated reduction in asthma cases as a result of heating improvements	164
<b>Financial proxy</b>	Average annual cost of asthma treatment	£185
<b>Deadweight</b>	National improvement in number of people with asthma in the UK	0%
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	N/A	
<b>Drop off</b>	Capital depreciation of windows and heating	6.6%

The reduction in number of cases of asthma in children as a result of improvements to heating systems was calculated above, using the 'population attributable factor' and applying this to the population of children in NCH properties. This method calculated that improving heating systems would result in 164 fewer cases of asthma in children.

The average treatment cost for a child with asthma is £185, based on total annual costs of asthma treatment and the number of people with asthma (figures from Asthma UK<sup>43</sup>) Thus the cost saving to the NHS from reducing 220 cases of childhood asthma is £30,340.

As the method for calculating the indicator is the same as for the outcome for tenants above (reduction in number of school days missed as a result of improved respiratory health), the calculations and reasoning for deadweight, displacement, attribution and drop-off are the same as for the earlier outcome.

<sup>43</sup> Asthma UK states that the NHS spends around £1bn treating asthma in the UK each year, and that 5.4m people currently suffer from asthma. See <http://www.asthma.org.uk/news-centre/facts-for-journalists/>

*Reduction in number of cases of depression resulting from cold conditions*

Outcome summary		Quantity/value
<b>Stakeholder</b>	Nottingham City NCH	1
<b>Indicator</b>	Estimated reduction in number of cases of depression as a result of reducing excess cold	806
<b>Financial proxy</b>	Annual cost of treatment for depression	£2,218
<b>Deadweight</b>	Prevalence of depression in the UK	9.7%
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	Contribution of other factors in mental health	50%
<b>Drop off</b>	Attribution drop-off as other factors affect mental health in future years	50%

The reduction in number of cases of depression as a result of excess cold conditions, measured earlier as a positive impact for tenants, also has a corresponding positive impact on the resource burden for the NHS. The indicator is calculated in the same way as above, using the 'population attributable factor' of excess cold conditions on mental health, applied to the adult tenant population in Aspley. This results in an estimated 806 fewer cases of depression.

The average direct cost to the NHS of treating depression is taken from a report by the Kings Fund from 2008, and with the price updated for inflation to 2011 prices gives a total cost of 2,218.<sup>44</sup>

Figures for deadweight, displacement, attribution and drop-off are the same as for the earlier outcome for tenants (improved mental health as a result of reduction in cold conditions).

<sup>44</sup> McCrone, P., Dhanasiri, S., Patel, A., Knapp, M. and Lawton-Smith, S. (2008) *Paying the price: The cost of mental health care in England until 2026*.  
[http://www.wikivois.org/index.php?title=Cost\\_in\\_the\\_NHS\\_of\\_treating\\_depression](http://www.wikivois.org/index.php?title=Cost_in_the_NHS_of_treating_depression)

## Outcomes for One Nottingham

### Reduction in carbon emissions

Outcome summary		Quantity/value
<b>Stakeholder</b>	One Nottingham	1
<b>Indicator</b>	Change in tonnes of carbon from SAP emissions scores following improvements	1,547
<b>Financial proxy</b>	Shadow cost of carbon (per tonne)	£27
<b>Deadweight</b>	National average increase in SAP ratings of social rented properties 2007-2010	7.9%
<b>Displacement</b>	Tenants' own investment in windows and heating	7%
<b>Attribution of others</b>	N/A	0%
<b>Drop off</b>	Capital depreciation of windows and heating	6.6%

The carbon emissions of each property are measured using the Standard Assessment Procedure (SAP).<sup>45</sup> SAP ratings from NCH properties were collected during stock condition surveys. The surveys began in 2009, with some completed prior to the installation of DECENT HOMES elements, and some following the installation. This provides data for a benchmark and a comparison following the installation of windows and heating.

Comparing SAP scores from a sample of NCH properties prior to installation of new windows and/or heating, with ratings after their installation shows an average reduction of 0.5 tonnes of CO<sub>2</sub> per year for each property. A total of 3,094 homes in Aspley were fitted with new windows and/or heating, giving a total reduction in carbon emissions of 1,547 tonnes CO<sub>2</sub> per year across Aspley.

The Department for Environment, Food and Rural Affairs (DEFRA) provides a 'shadow cost of carbon', which is based on the global social cost of carbon (i.e. the full global cost of the damage caused by each tonne of carbon), but takes into account the UK's policy and technology environment. According to DEFRA's report, the shadow cost of a tonne of carbon is £25 in 2007, and rises 2 percent per annum; accordingly, the current shadow cost of carbon is £27 per tonne.

Deadweight is accounted for using national trends in energy efficiency improvements in the social rented sector over a similar period (2007-2010). Annual fuel poverty statistics from the Department for Energy and Climate Change<sup>46</sup> show that SAP ratings

<sup>45</sup> SAP is the Government's Standard Assessment Procedure for Energy Rating of Dwellings, where properties are scored between 1 and 100 based on energy costs associated with space heating, water heating, ventilation and lighting, minus cost savings from energy generation technologies.

<sup>46</sup> DECC (2012) Annual Fuel Poverty Statistics 2012 <http://www.decc.gov.uk/assets/decc/11/stats/fuel-poverty/5270-annual-report-fuel-poverty-stats-2012.pdf>

have improved by 7.9 percent. This therefore provides an estimate of how much energy efficiency may have improved otherwise.

Displacement accounts for tenants' own investment that may have been displaced by NCH's Decent Homes programme, measured by the refusal rate for windows and heating at 7 percent.

As the outcome measures only the changes in carbon emissions that are directly as a result of the improvements to windows and heating systems made by NCH in Aspley, NCH is fully accountable for the outcome.

The carbon savings will continue year on year, over the five years of the return analysis. The capital depreciation of the windows and heating is included as drop-off at 6.6 percent.

### *Boost to the local economy*

Outcome summary		Quantity/value
<b>Stakeholder</b>	One Nottingham	1
<b>Indicator</b>	Total contribution to the local economy (investment plus multiplier effect)	£22.6m
<b>Financial proxy</b>	Total value of spending in the local economy	£22.6m
<b>Deadweight</b>	Proportion of funding from local government	16%
<b>Displacement</b>	Tenants' own investment in home improvements	12%
<b>Attribution of others</b>	N/A	0%
<b>Drop off</b>	Duration only for one benefit period	N/A

The investment in the Decent Homes programme is an outcome in itself for One Nottingham, representing a significant investment in the local economy. Not only does the initial investment boost the local economy, but the way it is spent and re-spent by local businesses and people means that there is a multiplied effect on the local economy from the initial investment. A Local Multiplier 3 (LM3) analysis was carried out for the Decent Homes programme in Nottingham. This measures how much of the initial investment stays within the local economy, and is spent and re-spent by local people and businesses. This therefore measures the multiplied effect of the investment on the local economy.<sup>47</sup>

The LM3 score was calculated using information gathered from NCH's financial data in the initial investment (round 1), and a short survey with the seven contractors delivering the Decent Homes programme, covering both their own spending (round 2),

<sup>47</sup> For more information on the Local Multiplier 3 model, see <http://www.proveandimprove.org/tools/localmultiplier3.php>

and that spent on their staff, subcontractors and suppliers (round 3). The survey covered the whole programme for the financial year 2010/11.

The Local Multiplier score for 2010/11 is calculated by adding up the local spending on the programme for all three rounds, and then dividing the result by the initial income (round 1):

**Table 2: LM3 score calculations**

2010/11		Nottingham City		Nottinghamshire (including city)	
		Local spend	% total	Local spend	% total
Round 1:	SWM funding	£37.6m		£37.6m	
Round 2:	NCH salaries	£4.8m	13%	£4.9m	13%
	Contractors				
Round 3:	NCH staff re-spend	£8.7m	35%	£12.3m	50%
	Contractor salaries				
	Sub-contractors				
	Suppliers				
	Local rent				
	Community grants				
<b>LM3 score:</b>		<b>£1.36</b>		<b>£1.46</b>	

The LM3 score shows that every £1 of the initial investment from the Decent Homes programme generates £1.36 within Nottingham city, or £1.46 spending across Nottinghamshire (including the city). This means that every £1 that is spent on DECENT HOMES generates an additional 36p of spending in Nottingham city, due to the way it is re-spent by local businesses and people; when the rest of Nottinghamshire is included, the additional spending increases to 46p.

Taking the LM3 score for Nottingham city and applying it to the programme in Aspley, the initial investment of £16.6m generates an additional £6.0m spending in the local economy.

Without the Decent Homes programme, some investment would have taken place anyway using funding from the local government. This funding accounted for 16% of the total Decent Homes funding, and is therefore included as deadweight.

Displacement accounts for tenants' own investment that may have been displaced by NCH's Decent Homes programme, measured by the refusal rate for windows, heating, kitchens and bathrooms at 12 percent.

The duration of this impact only lasts as long as the income is being invested, and therefore only included in the first benefit period.



## 4. Measuring the impact

The overall impact is measured by multiplying the units of change per outcome (as measured by the selected indicators) by the financial proxy for each unit, and accounting for deadweight, attribution and drop-off of the value over future years.

### Total impact

The total value of the impact of the Decent Homes programme (taking into account the above deadweight, attribution and drop-off) is:

***£19.9m in the first year following the Decent Homes programme***

## 5. Social return calculation

### SROI ratio

The present value of the impact over the five years of the return analysis is calculated using the Treasury's discount rate of 3.5% in future years.

The total present value of the Decent Homes programme is therefore:

***£24.3m over the five years following the Decent Homes programme***

Given that the initial investment in Decent Homes in Aspley was £16.6m, the SROI ratio is equal to:

$$\text{SROI ratio} = \frac{\text{Total present value}}{\text{Total inputs}} = \frac{\text{£24.3m}}{\text{£16.6m}} = \mathbf{\text{£1.46}}$$

**Every £1 invested in the Decent Homes programme in Aspley generates £1.46 in social value**

### Sensitivity analysis

The sensitivity analysis explores the assumptions that have the largest effect on the SROI ratio, looking at the scale of the changes needed to return a ratio of £1:£1. The most significant results of the sensitivity analysis are reported here, giving an upper and lower range that the SROI ratio is expected to fall within. Other tests conducted are reported in Appendix 3.

The largest contribution to the value of the impact comes from the boost to the local economy, in which the initial investment in Nottingham from central government, plus its multiplied effect on the local economy, is counted. The proxy for the money recycled within the local economy was taken from the LM3 score for the Decent Homes programme in Nottingham as a whole. It may well be the case that tightening the definition of the local economy to just one ward would reduce the multiplier figure. This is tested by reducing the multiplier score to just 2p additionally generated for

every £1 invested (1/20<sup>th</sup> of the original multiplier, as Aspley ward is one of 20 wards within the city). This reduces the SROI ratio to £1.22 for every £1 invested.

Another issue raised was tested during the sensitivity analysis is the duration of some of the outcomes. Due to the long-term nature of capital investment such as the Decent Homes programme, some of the outcomes could be anticipated to last beyond the five years of the current return analysis. This is particularly the case for the increase in energy efficiency, and therefore the reduced heating bills for NCH tenants and reduction in carbon emissions for One Nottingham. These outcomes depend fully on the functioning of the elements installed and are not dependent on other socio-economic factors which may change over time. They are therefore expected to last over the long term, without significant attribution drop-off and a steady rate of outcome drop-off determined by the depreciation of the elements. If the duration period is extended to 10 years for these two outcomes, the SROI ratio increases to £1.58.

Therefore the sensitivity analysis suggests that the return is within a range of £1.22 to £1.58 for every £1 invested.

### Verification

The project steering group also conducted an in-depth review of the assumptions made during the calculations. The results were then verified through presentation of the results and collection of feedback from across the stakeholders, at the following events and forums:

- Decent Homes tenant panel
- Crime and Drugs Partnership event attended by 60 local stakeholders, including police
- Public Health forum attended by 90 local public health stakeholders
- On-going meetings with NFRS stakeholders
- One Nottingham thematic Boards e.g., Green Theme Partnership, Working Nottingham Board

## 6. Conclusion

One of the key objectives of the project was not only to understand what the impact of the Decent Homes has been, but also to use this evidence to inform future housing investment decisions. Understanding the social impacts of housing programmes adds further depth and quality to the information used to make decisions on priorities, specifications and programme design.

The research has shown that each element fitted, such as windows, boilers and kitchens, has a range of implications for the wellbeing of the occupants. The research validates the priorities that tenants themselves set for the Secure, Warm, Modern programme; for example, the windows installed under the 'Secure' programme, the first stream to be implemented, deliver a number of benefits by not only making properties more secure, but also warmer, less draughty and with less condensation.

The evidence of these wider benefits justifies NCH's decision to go beyond the basic Decent Homes standard, and replace every single glazed window with Secured by

Design, A-rated thermally efficient models. Including such benefits gives a clearer indication of value for money, where 'value' takes into account the outcomes that tenants see as result of the investment. The window replacement programme therefore represents a cost-effective intervention. This view of value for money again justifies placing the 'Modern' stream towards the end of the programme, as the evidence suggests that there are perhaps fewer wider benefits from new kitchens and bathrooms, despite their being a core element of the national Decent Homes criteria, compared against the cost of installation.

As well as providing supporting evidence of the benefits that have resulted from the programme, the research has suggested where priorities and planning could be changed to deliver additional benefits. For example, the current programme replaces doors only where they are in particularly poor condition; the evidence gathered here suggests, however, that a larger-scale door replacement programme would have considerable benefits in terms of further target-hardening properties against burglary, and improving air-tightness and insulation. This might, for instance, justify prioritising the doors programme over, for example, the kitchen programme, as the door programme could deliver more social value per pound invested than does a higher-cost kitchen installation.

Evidence of social benefits helps in reviewing the way that housing investment could be planned or prioritised based on information about people and communities, rather than merely on properties. For example, as recommended in the crime report, if a door replacement programme were to be implemented, this could be prioritised by identifying people or communities that are most vulnerable to burglary via a door, using information shared by the Crime and Drugs Partnerships on crime hotspots. Intervening earlier by prioritising the programme according to the vulnerability of the occupant in this way, rather than by the property type, could in this example potentially save lives.

The research has highlighted that the way that the programme is delivered, as well as what is delivered, also matters for social outcomes. For example, while the completed work in the home delivers a range of positive outcomes for tenants, the process itself has the potential to be stressful and to have a negative impact on tenants' wellbeing. For this reason, NCH closely monitors customer satisfaction with the process and works delivered, through regular and extensive surveying following the works. Involving tenants in the design of the programme and how it will be delivered, as was the case for the Secure, Warm, Modern programme, also helps to ensure that potential negative or unintended impacts are prevented and that tenants feel a sense of 'ownership' over the programme.

Consideration of how social benefits can be optimised, for example, from future housing investment programmes, should begin from the initial programme design and procurement stage. This ensures that additional positive social benefits, such as local employment, skills and training, and contributions to community projects, are incorporated into the programme from the outset. It means that such benefits can be monitored throughout the programme delivery, for example, through programme and contractual KPIs.

The Decent Homes Impact Study has provided valuable evidence on the social impacts of the Secure, Warm, Modern programme in Nottingham, as well as enhancing

organisational learning through the process of carrying out the impact study itself. It has added quality and depth to the information used to shape NCH's long-term investment planning, such as the 30-year Asset Management Strategy, focusing not only on the physical state of the property, but also on the impact on people and communities. Finally, the study has supplied the evidence to show the true value of providing a decent home that is secure, warm and modern, capturing the value of the wider social and community benefits envisioned from the outset of the Decent Homes programme. This information has been of value to both NCH and the wider housing sector, including the Homes and Communities Agency. NCH will continue to measure the wider impact of housing investments.

## Appendix 1: Stakeholder engagement

### Discussion guide from TRA focus group on crime and security

Nottingham City Homes are currently doing some research to understand what the impact of fitting new double glazed windows (as part of the Decent Homes programme) has been on residents in Aspley and Bells Lane, and whether it has had any impact on crime before and after the windows were fitted (over the last 3 years).

#### ***Crime patterns in Aspley***

1. What are residents' perceptions of crime, particularly burglary?
2. Has this changed over the last 3 years?
3. What do you think are the major contributing factors to any changes in burglary?
  - Any initiatives, changes in the community

#### ***Security of homes***

4. How secure are properties in the area?
5. What difference has fitting Secured by Design windows made to:
  - How safe residents feel in their homes?
  - Burglary/safety in the area?
  - Types of crime/methods of entry?
6. Are there any other differences that fitting the double glazed windows has made to the area?
  - Look/feel of neighbourhood
  - Resident satisfaction with area
  - ASB

#### ***Burglary/crime initiatives***

7. What other initiatives are happening in the area that may have an impact on burglary?
  - Are these having a positive/negative impact?
  - Which do you feel are having the biggest impact
8. Overall, in the context of these initiatives, how important do you think the replacement of the windows with Secured by Design windows been on reducing burglary in the area?
9. Is there anything further that you would like to raise/discuss?

## Interview guide for tenants on health and wellbeing

### **Before DECENT HOMES**

1. Firstly, can you tell me what work you've received under the DECENT HOMES programme, and when this was done?
2. Thinking back to before any of this work was done, can you tell me what a typical winter's day was like in your home before Decent Homes?
  - Probe differences between household members (especially very young and very old): what was it like getting up in the morning, washing/bathing, doing housework, going to bed, use of rooms/house space, draughty/cold parts of the house, warmth and comfort, social life.
3. Were you able to keep your house warm enough for you?
  - Was the heating system efficient? Did it heat all areas of the house?
  - Were there any significant causes of loss of heat e.g. drafts, poor insulation?
  - Did you worry about the costs of heating your home?
4. Were there any other problems with the condition of your house?
  - E.g. damp, mould, poor cooking/washing facilities
  - Did you have any concerns about security?
5. How did the house make you feel?
  - Did you experience any negative feelings e.g. anxiety; frustration; worry about what others might think; worry about security?
  - Any positive feelings?
6. At that time, how would you rate your health- was it:

<i>(1) Excellent</i>	<i>(4) Fair</i>
<i>(2) Very good</i>	<i>(5) Poor</i>
<i>(3) Good</i>	<i>(6) Very poor</i>

  - Probe existing health conditions, management requirements
  - Can I ask, do you smoke or have you smoked in the past?
7. Did you need to use a health service as a result of your condition- e.g. GP, hospital?
  - How often did you visit the GP/hospital? (e.g. weekly, monthly, every 6 months)
8. Do you feel that the conditions in your home affected your health in any way?
  - Probe existing health conditions (were they made worse?);
  - Any new health conditions (were they caused by the house?)
  - Do you think this increased your visits to health services (e.g. GP, hospital?)

### ***During the refurbishment process***

9. How did you feel when you found out you were getting DECENT HOMES work?
  - Positive feelings about the upgrade?
  - Negative feelings about the change/process?
10. How much control did you feel you had over the process? E.g. choices, flexibility of timing
  - How did that make you feel?
11. How did you find the refurbishment process whilst it was underway?
  - Were you able to cope e.g. manage your day to day living and health condition?
  - Did anything cause you stress, worry, anxiety?
  - Did you have any extra support or help from NCH?
12. Was the installation process and the results what you expected? Did the intervention meet the needs of all the household?

### ***After the DECENT HOMES work***

13. Now you've got it, would you say it has made a difference?
  - To you? To other members of the household?
  - In what ways?
  - (If had heating) Has it made a difference to your fuel bills?
  - What made the biggest difference?
  - Have you had any problems since the installations?
14. What is a winter's day in your home like now?
  - Use of rooms/house space, convenience, efficiency, warmth, comfort, mood/state of mind, worry, social life, feelings of safety (for those who had security measures)
15. How would you rate your health now- is it:
  - (1) Excellent
  - (2) Very good
  - (3) Good
  - (4) Fair
  - (5) Poor
  - (6) Very poor
16. In what ways do you think the DECENT HOMES work has affected your health / illness?  
Other household member's health/illness?
  - Probe: colds, flu, asthma, other?
17. Has it affected your/their use of health services (GP visits and callouts; A&E, NHS Direct)?
18. How does the house make you feel now?
  - Did you still experience any negative feelings?
  - Any positive feelings?

## Appendix 2: Calculating the environmental burden of disease from poor housing

The method for estimating the burden of disease resulting from poor housing conditions is taken from the World Health Organisation's 2011 report, *Environmental burden of disease associated with inadequate housing: A method guide to the quantification of health effects of selected housing risks in the WHO European Region*. The aim of this report is to provide a standardised and robust way of estimating the contribution that housing makes to health outcomes.

The method is based on calculating the 'population attributable factor' (PAF) i.e. the proportion of the disease that is caused by the hazardous factor, and would therefore be avoided if this hazard was removed. The PAF takes into account the relative risk (RR) that once exposed to the hazard, the individual will contract the associated disease/suffer ill health as a result. The relative risk factor is supplied from a systematic search of high quality studies that have tested each area. The PAF then also takes into account the prevalence (p) of the hazard in the population. The WHO report sets out prevalence rates for various countries; however, in this report national prevalences are replaced with local ones, to provide an accurate estimation of the PAF for the local area under study. The formula for the PAF is:

$$\text{PAF} = \frac{p(\text{RR}-1)}{p(\text{RR}-1) + 1}$$

The PAF is then applied to the total burden of that disease. This provides a figure for how much of this disease is attributable to housing conditions.

To provide a worked example, the case of the effect of poor heating systems on children's respiratory health is set out below.

The WHO states that children living in homes with poor heating systems have double the prevalence of respiratory illness, i.e. a relative risk of two. In Aspley, 52% of homes have poor heating that was replaced under the Decent Homes work. Therefore the PAF is:

$$\begin{aligned}\text{PAF} &= \frac{0.52(2-1)}{0.52(2-1) + 1} \\ &= 0.34 \text{ (34\%)}\end{aligned}$$

Approximately 21% of children in central England have asthma, and as there are 2,283 children in Aspley, we can expect that 480 of them suffer from asthma. We then apply the PAF to this total, i.e. 34% of this total number of cases is as a result of poor housing, which equals 164 cases.



### Appendix 3: Sensitivity analysis

The most significant tests from the sensitivity analysis are reported above, giving the lower and upper limit in the SROI ratio as a result of the tests applied. Further tests were conducted in the sensitivity analysis on all outcomes that gave the most significant contributions to the total impact value. The results are reported below:

#### *Improved mental health: Shorter duration*

Improvements in mental health cold internal conditions and lower fuel bills are currently assumed to continue for five years, but with a high drop-off rate. However, we could consider that changing life circumstances may play an overriding effect on mental health conditions. Therefore the assumption is tested by reducing the duration of this outcome to two years (still with 50% drop-off). This reduces the SROI ratio to 1.42.

#### *Emotional wellbeing as a result of reduction in fear of crime: Higher attribution*

Consideration of the attribution for this outcome was made, for example, to take into account the possibility of other factors in the neighbourhood, as well as the security of the property, affecting residents' fear of crime. For example, increasing the attribution of others to 50% lowers the SROI ratio to £1.43.

In addition, some outcomes initially included in the analysis were excluded during the sensitivity analysis, as once estimations were reached, the value of the outcome did not materially affect the overall SROI ratio. These outcomes included:

- Change in mental health outcomes as a result of removal of damp and mould
- Decrease in mental health as a result of the stress of the refurbishment process
- Benefits to the state from employment of 10 apprentices, such as decreased welfare bill and increased tax-take from salaries
- Negative impact on the environment from increase in waste to landfill