Cambridge Centre
for Housing &
Planning Research

Cost effectiveness of lighting adaptations

A report for the Pocklington Trust

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October 2011

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Contents

Context to study

Meeting the needs of an ageing population is one of the key issues affecting both the housing sector and wider social care agenda in the UK at the present time. Increasing numbers of older people wish to remain in their home for as long as possible, and this means there is a growing need for support and adaptations in the home. Sight loss is one difficulty that many older people encounter, and the links between sight loss and other health difficulties, in particular falling in the home, are well-documented[1]. As the Pocklington Trust is well aware, sight loss brings a huge financial cost to society, as well as the negative effects on the quality of life of those affected. One factor known to be related to sight loss is an increased risk of falling.

Reducing the risk of falling has been identified as an important element in reducing NHS costs (DCLG, 2009). The current economic and political climate means that there is a stronger need than ever for services to demonstrate cost-effectiveness of services requiring state funding. Across the voluntary sector, organisations are aware of the need to demonstrate that investment in activities is cost-effective, as well as fulfilling wider social objectives (Oxford Brooks, 2010).

Within the social care field, there has for many years now been a drive to increase the length of time that frail elderly people are able to remain in their own home. This is in part a response to the desire of most elderly people to do so and in part a result of the high costs of maintaining people in residential accommodation.

Aims

The aim of this study is to estimate the costs and benefits to the taxpayer of fitting lighting adaptations in the homes of elderly people at risk of falls.

The focus is on people living in their own homes, rather than in care homes or any other setting. The potential benefit studied is the potential reduction in the risk of falling.

Methods

Data was collected on the costs of lighting adaptations from a pilot scheme carried out by the Pocklington Trust in 2007. The contractor made available data on both the costs that had been budgeted for and actual costs incurred, and the numbers and types of properties which were surveyed and fitted with adaptations for this cost.

The Pocklington Trust also made data available on other costs related to running the scheme, including office costs and overheads.

This information was supplemented with a review of the literature in the field in order to make the best possible estimates of the likelihood of lighting adaptations preventing a fall, the costs of falls to the NHS and of other costs and benefits associated with fitting lighting adaptations.

An analytical framework was then developed in order to establish the cost effectiveness of lighting adaptations in the homes of partially sighted people, and a toolkit was developed for use by the Pocklington Trust or others to update with new data in the future.

[1] **See** www.ageuk.org.uk/latest-press/poor-vision-leads-to-falls-for-270000-over-60s/

Annex 1 describes how the calculations were made, drawing on the literature review which is contained in Annex 2.

Results

The results of this analysis were not strongly conclusive in terms of the cost effectiveness of lighting adaptations. The headline results are given in Table 1 (below) and explained in Annex 2 and the accompanying Toolkit.

Table 1: Key results

Cost per beneficiary of lighting adaptations	£1,024
Estimated costs to taxpayer per fall	£524
Number of falls per 1000 people aged 75+ in next 12 months without intervention	900
Proportion of residents who could potentially have risk reduced by better lighting	94%
Reduction in risk of falling from improving lighting	10%
Estimated reduction in number of falls per 1000 people per year after adaptation	85
Number of lighting adaptations to save 1 fall per year	9.4
Financial gain to taxpayer per lighting adaptation per year	£56
Number of years lighting adaptations will last	25
Overall saving over life of lighting adaptation	£111
Overall saving per year per adaptation	£4
Numbers of years to recoup spend	23.0

Conclusions

There is a substantial degree of uncertainty over several of the assumptions used to make these estimates, in particular over the reduction of risk of falling from improving lighting adaptations. Some falls prevention programmes have seen much higher levels of reduction, and if these could be achieved the savings would greatly increase.

The costs related to falls have also been estimated conservatively, and may in fact be higher and increases to some elements (such as the time spent in residential care) would result in considerably higher costs related to falling.

Recommendations

There are several ways in which the cost efficiency of lighting adaptations could be improved. These include:

- Greater targeting of the scheme towards the highest risk groups – These include women, over 80s, those living alone and people who have had a fall in the past.

- *Analysis of the different elements of the adaptations and a focus on those most likely to prevent falls*. The scheme under assessment here carried out a whole range of improvements. Some, such as wardrobe lighting, may improve people's quality of life, but are unlikely to reduce falls. The literature suggests that good lighting on the stairs is most likely to be of value.
- *Consider a less comprehensive service to a higher number of households*. If improvements could be made at a cost of £100 per dwelling, a reduction in falls of only 1% would be sufficient to be cost effective, under the current assumptions used here.
- *A greater emphasis on the way in which lighting is used.* It is known that some people fail to make use of the lighting that is available in their home, or fail to replace light bulbs that fail. Ensuring that available lighting is used effectively could be a cost-effective means of reducing falls.
- *Further research into the effects of lighting adaptations in preventing falls.* There is clearly a real lack of evidence in this area. Whilst it is known that poor sight affects the likelihood of falling, the effectiveness of improved lighting in combating the effects of poor sight in this respect remains untested. A large scale study would be needed in order to establish the effectiveness of lighting adaptations.

Annex 1: Literature review

Falls are a serious yet common problem for older people. Falls services for older people developed rapidly in the UK after the publication of the National Framework for Older People in 2001. More than one third of persons 65 years of age or older fall each year (Tinetti, 2003; Rubenstein, et al. 2002).

In recent years, the importance of good vision in preventing falls has increasingly been recognised (College of Optometrists, 2010). Research has consistently shown that poor vision is strongly associated with falls (Abdelhafiz et al, 2003; Cumings, 1996; Jack et al, 1995; Ivers et al, 1998)

However, the role of improved lighting interventions in reducing the risk of sight loss contributing to falls is not always a key priority. Publications looking at how to prevent falls do not always mention the role of improved lighting (Age Concern, 2010). In a 2008 survey of services for the prevention and management of falls in the UK, Lamb et al (2008) concluded that multi-factorial assessments and interventions are the most common form of NHS falls services, but raises concerns that significant numbers of services are failing to attain the standards set by NICE, and in particular that assessments of vision and referral to appropriate services is often overlooked.

How common is falling in older people?

In large scale population study carried out in 1995 (Tinetti, 1995) found that 49% of people aged 72 and over experienced a fall during the course of a 31 month study, and just over a third in any one year. Other studies have found similar rates of falls (one in three) for over 65s, and a rate of 50% of those aged over 80 (Davies et al 2010; Rubenstein et al, 2002)

It is well known that women fall more commonly than men (ibid). A large cohort study carried out in 2006 on a population aged 59 to 73 (Sayer et al) found that the prevalence of any fall in the last year was 14.3% for men and 22.5% for women. Other studies have found similar gender differences in the older age group, at highest risk from falling (Tinetti, 2003).

One study suggested that around half of all falls requires treatment in an Accident and Emergency department (Sayer, 2006), although other studies have found somewhat lower figures. It has also been found that one in ten of falls result in a serious injury, such as hip fracture, other fracture, subdural hematoma, other serious soft-tissue injury, or head injury (Tinetti, 2003).

Some older people are at much higher risk than others of falling, being aged over 75, living along, being female and having falling in the past are all strong predictors of a future fall. One recent study into the success of a falls prevention programme found that the rate of falling in high risk groups living in the community was 2.24 falls per person per year (Irvine, 2010). Interventions that target high-risk groups can therefore hope to prevent much higher numbers of falls than those who target all older people living in the community.

What is the cost of falling?

The costs (to the state) of falling depend on the severity of the fall, and the degree of medical treatment necessary. A large number of falls are not serious and either require no treatment or involve the victim being checked over at A&E but no further treatment required. A small proportion of falls result in very serious consequences, including death and hip fractures. Some of these serious falls result in very high costs, sometimes in excess of £30,000 to the NHS and to social services if the victim requires a long stay in hospital and a move to residential care, or a very intense care package, as a result. To establish the potential savings from reduced levels of falling, it is necessary to estimate the average cost per fall to the taxpayer (via the NHS and social services).

The most recent study on the costs of falling in the UK comes from 2003 (Scuffham et al). It found that in 1999, there were 647 721 A&E attendances and 204 424 admissions to hospital for fall related injuries in people aged 60 years and over. The total cost to the UK government from unintentional falls in the year 2000 was £981 million. Scuffham found that 59% of this cost was incurred by the National Health Service and the remainder by the Personal Social Services for long term care. Cost (at year 2000 rates) included in this study were drawn from the Hospital Episode Statistics for England and Wales and the Leisure Accident Surveillance System and consist of:

- Ambulance journeys (£179 per journey)
- Initial GP consultations (£18 each)
- Attendance at A&E (£65 each)
- Hospital inpatient costs (between £1453 and £2490 per person admitted depending on age group and type of fall)
- Follow up attendance at outpatients (£68 each, assumed one attendance per person referred)
- Follow up attendance at GP (£18 each, assumed one attendance per person referred)
- Admission to long term care/long term hospital (£9594 per person, based on an estimate of six months extra care at £369 per week in an independent [private or voluntary] nursing home for older people)

The study then draws on data on outcomes for all falls that result in A&E attendance, which consist of:

- Examined, no more treatment required (37.3% of those aged over 75)
- Referred to outpatients clinic (26.4% of those aged over 75)
- Referred to GP clinic (13.3% of those aged over 75)
- Admitted to hospital (23% of those aged over 75)

And of hospital inpatient outcomes:

- Discharged, no more treatment required (18.5% of those aged over 75)
- Discharged and referred to GP (8.9% of those aged over 75)
- Discharged and referred to outpatient clinic (45.3% of those aged over 75)
- Transferred to longstay care (27.4% of those aged over 75)

As the authors acknowledge, the area of the largest uncertainty in this model is the length of time that people spend in longstay care, above and beyond the time when they might have moved to longstay care anyway, without the fall. The conservative estimate of 6 months is made, but if this were increased to 24 months this would double the average cost of a fall.

A recent international review of the literature around the costs of falls includes the Scuffham study as the only available data from the UK (Heinrich, 2010). Data from other countries, as expected, varies, but is broadly of the same order of magnitude. The UK study gives a cost per inhabitant per year of $165, which falls roughly half way down the figures from the other eleven studies.

Very similar costs are reported by NICE (2004) who report that in 1999, there were 647,721 A&E attendances and 204,424 admissions to hospital for fall-related injuries by people aged 60 years in the UK. The estimated cost of these falls to the NHS and Personal Social Services was £908.9 million (ibid). Parrott (2000) calculated overall costs of falls to the NHS of £726 million from falls resulting in hip fractures alone. This is broadly in line with the Scuffham study, as a large proportion of overall costs were incurred from the small number of patients who were admitted as inpatients or who were discharged into long term care, which would include those who fractured hips.

Overall the data from the Scuffham study suggest that the average cost of a fall requiring A&E attendance was around £1500, which would be about £2000 at today's prices.

Little is known about the outcomes for those who fall but do not attend A&E, although it is known that 40% of ambulance call-outs to elderly people who have fallen do not result in attendance at A&E (Halter et al, 2011).

Specific calculations relating to the costs of falls by partially sighted and blind people have been made by Access Economics (2009). They calculated the total cost of falls by visually impaired people over the age of 75 as being £15.48 million. They calculate that there were 37,201 falls by visually impaired people in this age group in 2008.

What impact does reduced vision have on the risk of falling?

A variety of studies have explored this issue, some looking at specific types of visual loss, or as a result of specific conditions (Boyce, 2011; Klein et al 2000; Steinman, undated). Overall estimates tend towards the view that impaired vision can double the risk of a fall in older people (Boyce, 2011; Coleman et al, 2004; Klein et al 2000; Ivers et al 1998). Younger people with sight loss are not at such risk because the effects of sight loss often interact with other difficulties that older people tend to suffer from particularly those relating to poor balance (Black, 2005).

Boyce (2011) examines the evidence around visual impairment and falling and concludes that 47% of all falls in older people with visual impairment are related to their visual impairment.

What impact can better lighting have on reducing the risk of falling?

Many studies have looked at the role of improved lighting interventions as part of wider programmes and there is a fairly substantial body of evidence showing that overall environmental improvements, which often include improvements to lighting, do reduce falls (Chang et al, 2004, Rubenstein, 2010). The Clinical Practice Guideline for Prevention of Falls in Older Persons issued by the American Geriatrics Society and British Geriatrics Society (2001, 2011) recommends vision intervention as part of a multifactorial assessment and intervention strategy.

Some of the studies in this field have attempted to separate out the different types of intervention and to look at the specific impact of lighting improvements. Unfortunately, the numbers involved in the studies that needed better lighting were mostly very low and hence conclusions about their efficacy hard to draw (Jensen et al 2002; McMurdo et al, 2000; Millar et al, 1999). Overall, NICE concluded in 2004 that there was no specific evidence that referral for correction of vision alone reduces the risk of falling and there do not appear to have been any significant studies that have looked at this as an intervention on its own in the last seven years. This does not mean that it does not work, just that there is a lack of evidence.

Research has shown that 30% of older people (over 65) are visually impaired in both eyes but that for 72% of this group, their vision could be improved by surgery or wearing glasses. Interventions seeking to reduce falls have therefore often focussed on the benefits of improving vision. An Australian study (Day et al, 2002) explored the effects of other types of interventions aimed at reducing falls amongst older people with sight loss. The study found that group exercise interventions had the most measurable effect when used alone but that bigger reductions in falls were made by those who also received home hazard management and treatment for poor vision, with improvements in the range of 6-30%. Other studies of a variety of fall prevention programmes have found reductions in falls of 18% (Beauchet et al. 2010), etc whilst others have found no measurable impact (McMurdo 2000). An overview of the evidence suggested that most studies saw reductions in falls of between 6 and 33% (McClure et al, 2005).

One very recent study has looked at the effect of lighting conditions on gait length of older people (Figueiro et al 2011). It is known that the risk of falling increases with short or uneven gait length and this study compared the effects of different types of lighting on the gait length of a group of 24 older adults identified as being at risk of falls. The study found that participants performed best under the ambient illumination provided by 16 ceiling-mounted fixtures (650 lux at the cornea) general ceiling-mounted light system and worst under two conventional plug-in incandescent 6 watt night lights (0.015 lux at the cornea). The study's authors conclude that lighting that increases visual clues can potentially reduce the risk of falls in older adults.

One study carried out in Merseyside attempted to measure the impact that poor lighting has on the risk of falling. Davies et al (2001) questioned 1253 patients attending the Royal Liverpool University Hospital for diagnosis and treatment of injuries and identified those who had suffered a fall. Patients were asked about the conditions in which they fell, including lighting conditions. The results suggested an odds ratio of 3.28 on falls occurring in poor lighting conditions, compared with the risk of other injuries, or rather that there was an increased chance of 75% of falling in poor light.

This should be interpreted with some caution, however, as it relates to falls both in and out of the home, and the large majority of patients were not elderly.

Summary

It is known that falls are more likely to happen in poor light, that the visually impaired are more likely to fall, and that falls prevention programmes offering a variety of home improvements (including lighting) can achieve a measurable reduction in falls of between 6 and 33%. There is, however, clearly a lack of robust evidence on the effectiveness of lighting adaptations in reducing falling as this has not been the main focus of any study of which we are aware.

Other benefits

It is very likely that there will be other benefits from improving lighting, other than the financial saving to the NHS from reduced number of falls. These include:

- Other financial benefits to the taxpayer:

- Savings to the NHS from a reduction in later health difficulties triggered or exacerbated by falling
- Savings to the NHS from other home accidents or health consequences related to poor lighting such as cuts or burns in the kitchen, or failure to read medicine labels.
- Savings to the NHS from other factors related to poor lighting, such as depression

- Benefits to the individuals including:
  - Not suffering the pain and trauma of a fall
  - Reduced likelihood of death either directly or indirectly from a fall
  - Improved quality of life from being able to enjoy the home more, choose clothes to wear, read better, use computers, etc
  - Improved levels of confidence in living independently
  - Improved mental health

Many of these benefits were reported by individuals who benefitted from the Pockington Trust's pilot programme of lighting installation (SSMR, 2007). Others, such as improvements in mental health have been widely found in the literature.

A possible increase in electricity bills as a result of higher wattage light fittings is the only likely negative consequence of carrying out the installations, though at present these costs may be offset in many cases by savings from lower energy bills, if old style light fittings are replaced by low energy ones at the same time.

It has not been possible to quantify these benefits for the purposes of this study, but it should be noted that they are likely to exist.

Annex 2: Analytical framework for establishing the costs, benefits and savings from lighting adaptations

In order to establish estimates of the savings made by fitting lighting adaptations, the following data are needed:

A. *The costs of fitting lighting adaptations*

B. *The benefits of lighting adaptations*

C. *The savings (or costs) that will be incurred as a result of fitting lighting adaptations and reducing falls accordingly.*

Section A: The costs of fitting lighting adaptations

1. The costs of assessing homes

Figures have been obtained from a pilot project carried out by the Pocklington Trust in 2007. The contractor has supplied data on both estimated costs (used in putting together the contract) and actual costs and expenditure incurred. It is the actual expenditure figures that have been used. The pilot scheme contained a mixture of residents living in their own home and rooms within a care home. Estimates of the costs for the self-contained housing have been made from these data.

1.1. Total cost of pilot.

The figure of £13,900 was supplied by the contractor.

1.2. Number of self-contained properties assessed in this pilot

The contractor reported that 49 homes were assessed.

1.3. Number of rooms in care homes assessed in this pilot

The contractor reported that 17 rooms in a care home were assessed, all in the one care home.

1.4. Estimated costs to assess room as proportion of costs for a self-contained property

The focus of this analysis is on self-contained properties. Single rooms in the one care home, all built to the same specifications, are likely to take considerably less time to assess than separate properties, although the work to the care home also included some adaptations to communal areas. It has therefore been estimated that the contractor could assess four rooms in the time it would take to assess one self-contained property.

1.5. Estimated number of self-contained properties that could be assessed for total cost.

This is the estimate of the number of self-contained properties that could have been assessed for the total price if the contractor had only assessed independent properties and no rooms in a care home. (1.5 plus (1.4 times 1.3))

1.6. Cost per home assessed

This is the total cost, divided by the number of self-contained properties that could have been assessed (1.1 divided by 1.5)

1.7. Proportion accepted for intervention after assessment

It is likely that some dwellings will be deemed not to need improvements to lighting, or the residents may decline to have any adaptations. The Pocklington Trust's scheme took referrals from Occupational Therapists, who were well-placed to identify suitable households. The Pocklington Trust estimate that 10% of those referred for an assessment do not subsequently go on to have the lighting adaptations.

Cost per home accepted for installation

This is the total cost of assessment, per home that proceeds to get adaptations (1.6 divided by 1.7)

2. *Cost of installations*

2.1. Cost of labour for installations

The figure of £28,741 was supplied by the contractor

2.2. Cost of materials for installations

The figure of £20,198 was supplied by the contractor

2.3. Total cost of installations

This is the cost of the labour and the materials (2.1 plus 2.2)

2.4. Number of installations in self-contained properties

As above, the installations were carried out in a mixture of self-contained properties and rooms within a care home. The contractor reported that 49 installations were carried out in self-contained properties.

2.5. Number of installations at rooms in care home

The contractor reported that 34 rooms within the one care home had lighting adaptations installed.

2.6. Estimated costs to install in room as % of costs for a self-contained property

As above, this is the estimate of the proportion of time and materials that are needed to install adaptations to a single room, as compared with a self-contained property.

2.7. Estimated number of self-contained properties that could have lighting adaptations installed for the total cost

As above this is the estimate of the number of self-contained properties that could have had adaptations installed for the total price if the contractor had only been working on self-contained properties and no rooms in a care home. (1.4 plus (1.5 times 1.6))

2.8. Cost per property

This is the estimate of the cost to install lighting adaptations in the average self-contained property (2.1 divided by 2.7)

3. *Office costs*

3.1. Cost per property.

The Pocklington Trust estimate that their office and overhead costs associated with running the lighting adaptation scheme are approximately 19% of the costs incurred by the contractor. (1.8 plus 2.8 times 1.19)

4. *Total costs for lighting adaptations*

4.1. Total cost per unit of lighting adaptations

This is the total costs of assessment, installation and overheads involved in the Pocklington's pilot installation of lighting adaptations (1.8, plus 2.8 plus 3.1)

4.2. Year for which these are correct

The Pocklington Trust's pilot project ran in 2007.

4.3. Current year

This is 2011.

4.4. Annual inflation estimate since figures were produced

Costs of most things tend to increase as a result of inflation. The Government's preferred measure of inflation, the CPI, has averaged at around 3% over recent years.

4.5. Estimate of cost today per adaptation

The figures for the costs have been inflated by 3% for each year that has elapsed since the pilot was carried out, using the formula for calculating compound interest (4.1 times ((1+4.4) to the power of (4.3 minus 4.2)))

4.6. Mean number of people at risk of falling benefiting per own home

Some self-contained properties have more than one resident. The Pocklington Trust estimate that 25% of the properties in which lighting adaptations were fitted were occupied by more than one tenant who could potentially benefit. It has been assumed that these were all occupied by two tenants.

4.7. Cost per person

This is the cost per person who benefits (4.5 divided by 4.6)

Section B: Benefits of adaptations

5. *Costs of falling*

5.1. Cost to NHS per fall

This has been estimated from various sources of literature, with costs taken from Scuffham, 2003. Using cost data from 2000, the cost per fall that requires attendance at A&E was estimated as £1514 (or around £2000 at today's prices) and the average cost of a fall that does not require attendance at A&E as £57 (or around £79 at today's prices). This gives an average cost per fall of £524 at today's prices. An alternative estimate for the costs of falls by visually impaired people could be made from the figures used by Access Economics. They calculated the total cost of falls by visually impaired people over the age of 75 as being £15.48 million in 2008 and the number of falls by this group as 37,201. This would give a figure of £416 per fall, which would inflate to £455 at 2001 costs. This suggests that the £524 figure is of the right order.

5.2. Year for which this cost relates

The research from which these costs were taken was carried out in 2000.

5.3. Estimated costs today per fall

As above, it is necessary to increase this cost in line with inflation.

6. Reduction in falls as result of adaptations

6.1. Number per 1000 people who will fall in next 12 months without intervention

The Pocklington Trust's client group are elderly people with visual impairments. Most of the lighting adaptations were fitted in the homes of those aged 75 and over, the group most at risk of falling. Data from the Scuffham study (see literature review, above) show that there were 99 falls requiring A&E attendance per 1000 elderly people aged 75 and over.

However, the literature on the effects of visual impairments suggests that people with a visual impairment fall at approximately twice the rate of the rest of the population (see above). It has therefore been estimated that 198 falls requiring A&E attendance per 1000 visually impaired people aged 75 and over would occur without the lighting interventions.

6.2. Proportion of residents who could potentially have risk reduced by better lighting

The evaluation of the Pocklington Trust's pilot project found that the large majority of residents felt they had benefited from the improved lighting. A small number (two out of 35) were however unable to benefit because they were totally blind. It has therefore been assumed that the remaining residents (94%) could potentially benefit from the improved lighting.

6.3. Reduction in risk of falling from improving lighting these cases

There is a lack of evidence on the effectiveness of lighting adaptations in reducing falls. The literature review suggests that the visually impaired are more likely to fall, and that falls are more likely to occur in poor lighting. It would therefore seem unlikely that lighting adaptations would have no benefit, and also unlikely that lighting adaptations alone would have any greater benefit than home improvement programmes that include an element of lighting adaptations.

A cautious estimate of a 10% reduction in falls as the result of lighting adaptations has therefore been made, but it should be stressed that this is somewhat hypothetical in the light of any solid evidence. It is however, plausible in the view of the authors in the light of the extensive nature of the adaptations involved.

6.4. Estimated reduction in number of falls per 1000 people after intervention

This is established by multiplying the number of people who could potentially benefit, by the reduction of risk caused by the intervention

6.5. Number of lighting adaptations to save 1 fall per year

This is the 1000 divided by the number of falls prevented per 1000 beneficiaries (1000 divided by (6.4 times 4.6))

6.6. Financial gain per installation per year

The figure above is the benefits per resident. This is the benefits per installation (6.5 divided by 5.3)

Section C: Savings

This section calculates the savings (or costs) that will be incurred as a result of fitting the lighting adaptations and reducing falls accordingly.

6.7. Number of years lighting adaptations will last

The more substantial improvements to lighting that are carried out under the scheme consist of things such as new light fittings. These are likely to last for long periods of time, often as long as the property itself. Others, such as replacement bulbs have a shorter lifespan, though still 5 or more years and can be replaced at minimal cost, and at no cost to the taxpayer. It has therefore been assumed that the lighting adaptations have a lifetime of 20 years.

The lighting adaptations will only be of benefit in preventing falls if the occupant of the accommodation is someone at risk of falls. The assumption has been made here that the accommodation is designated as being for elderly people with visual impairment and will therefore be lived in continually for the next 20 years by an elderly person with a visual impairment. If other households occupy the accommodation, there may still be some benefit from the improving lighting, but it will not result in the cost savings from decreased falling identified here.

6.8. Overall saving over life of lighting adaptation

This is the annual financial gain to the NHS per year, multiplied by the number of years that the adaptation will last, minus the initial cost of making the adaptation (6.6 times 7.1, minus 4.5). The model here assumes a zero rate of inflation and the savings made are not discounted over time. In reality the adaptations could save more than this (if NHS costs increase over the coming years), or less (if the money used for the adaptations could make better gains by investment somewhere else).

6.9. Overall saving per year per adaptation

This is the total savings over the lifespan of the lighting adaptation, divided by the number of years it will last (7.2 divided by 7.1)

6.10. Numbers of years to recoup spend

This is the payback time – the amount of time before the lighting adaptation has paid for itself in terms of the reduction in the costs of falls (6.6 divided by 4.5)

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