Lighting the homes of people with sight loss: an overview of recent research

This publication presents findings from a review conducted by Dr John Percival.

Introduction

This paper relates to three studies of domestic lighting commissioned by Thomas Pocklington Trust. The studies, carried out by the University of Reading’s Research Group for Inclusive Environments (RGIE) between 2001 and 2006, were chiefly concerned with examining lighting in people’s homes in the context of their ability to carry out domestic activities of daily living. This paper therefore concentrates on internal domestic lighting and provides only brief summaries of findings on external lighting.

The paper discusses the rationale for the research in conjunction with the literature review, which identified important issues and gaps in knowledge. It outlines the research methodology used in the RGIE studies then briefly summarises the first two studies before considering in more detail the third study. This leads on to a consolidation of findings and themes arising across the studies as a whole. Next, the paper outlines relevant social policy initiatives and then moves on to discuss the value and limitations of the research. Implications for further research and development conclude the overview.

Rationale for research on domestic lighting – lessons from the literature

Systematic reviews of UK and international literature on domestic lighting, vision impairment and falls, eye conditions and daylight needs were carried out and updated during the period of the studies. The main aim of the reviews was to identify implications for policy and practice and to pinpoint potential research topics that address deficiencies identified in the literature.

The literature reviews involved a search of computerised databases, focusing on literature published between 2001 and 2006, as well as
a search of relevant design guidance, legislation, building regulations and standards relating to lighting and domestic homes. The RGfE used End Note software to collate search results.

**Age, vision impairment and the importance of lighting**

Between 1970 and 2004 the life expectancy of women in the UK rose by 3.5 years to 85 and that of men by 4.5 years to 82. It is expected to rise another three years by 2021.\(^1\) At the same time, growing numbers of older people have been registered blind or partially sighted in recent years.\(^2\) Indeed, the incidence of both low vision and blindness increases rapidly with age, as reported by Evans et al. (2002).\(^3\) The four most common eye conditions associated with older people are cataracts, macular degeneration, glaucoma and diabetic retinopathy.\(^4\) As people get older they experience a reduction in visual acuity and an increased sensitivity to glare; they also take longer to adapt to pronounced and sudden changes in luminance. Lighting can be used to compensate for these changes, so improving quality of life and independence.\(^5\) It is also important to consider the need of some visually impaired people for less light, where normal light levels are uncomfortable or disabling.\(^6\)

Low vision has been found to have a significant influence on quality of life,\(^7\)\(^8\)\(^9\) and improved lighting can actually affect the number of people assessed as functioning as visually impaired.\(^10\) An increase in light levels may increase general health and wellbeing and, conversely, light deprivation can result in sleep disorders and

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depression. Inadequate exposure to light – particularly light towards the blue end of the visible spectrum, found in daylight as well as artificial light – increases the body’s production of melatonin, which causes sleepiness. Lack of adequate exposure to light also reduces the body’s production of vitamin D.

Vision impairment and poor lighting appear to be contributory factors in the risk of falling. Indeed, in a study undertaken by Scuffham et al. it was found that 89% of falls requiring hospital treatment involved people over 75, and that 21% of the costs of treating accidents applied to people with visual impairment. The severity of these injuries increases with age and many such accidents take place on the staircase, which is a poorly lit area in the majority of older people’s homes.

Early diagnosis of vision impairment would help reduce the number of falls experienced by older people. The CRAG/DTI report suggests that many of the most effective interventions for providing a safe environment in the home are low tech and low cost and can be easily adapted by older people. The Royal Society for the Prevention of Accidents (RoSPA) has issued design guidance for preventing falls on stairs, which includes the recommendation that stairs are well maintained and well lit.

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20 CRAG/DTI (2001) op. cit.
Design guidance and related codes of practice

Despite the importance of good lighting, there is very limited design guidance relating specifically to domestic lighting. There is also little published research on how domestic artificial lighting can be optimised for people with sight loss. Most guidance published by the Society of Light and Lighting (SLL) and that published previously by the Lighting Division of the Chartered Institution of Building Services Engineers (CIBSE) relates to non-domestic buildings and has in mind middle-aged occupants with normal sight. There is also a lack of authoritative illuminance recommendations for lighting inside domestic buildings. Although London Electricity and the RNIB have produced a booklet on how to make the most of lighting, there is no advice about light levels related to specific visual needs.

A report by the Illuminating Engineering Society of North America succinctly summarises a number of lighting issues when it states that older people require freedom from glare, higher illuminances and enhanced luminance contrasts, as well as increased adaptation time to get used to changes in luminance between adjoining spaces or rooms. The report also advises on lighting stair treads, landings and handrails and makes recommendations for illuminance in rooms and for tasks.

In the UK, however, there are currently no illuminance recommendations for artificial lighting in private dwellings. The Society of Light and Lighting suggests substantial increases of light levels in generally hazardous areas such as staircases and kitchens. Julian recommends that residential care homes should be uniformly lit and meet recommended illuminances from current lighting codes. Although the RGIE rightly states that there has been little design guidance regarding domestic lighting in the UK, earlier studies, such as that of RNIB advised housing providers to consider installing adequate lighting that “exceeds current standards [and] allows visually impaired people to make the most of...”
remaining vision’. Home improvement agencies already have the potential to improve the domestic environment of people with sight loss by considering lighting options and levels of illuminance.28

The literature review reveals that lighting in the home is a complex subject in terms of its significance to the individual and their personal priorities.

**Lighting, individual preferences and priorities**

Lighting, like any other aspect of people’s domestic arrangements, is an individual matter, and people’s lifestyles, routines and personal priorities all have a bearing.

The DTI29 learned that despite low illuminances around stairs, and respondents’ general awareness of the danger of using stairs in low light, 85% of respondents would not consider using brighter light bulbs for a host of subjectively valid reasons. These included familiarity with their staircase, being accustomed to low light levels, reliance on touch rather than light and satisfaction with sources of light from outside. Aesthetics and personal choice also affect willingness to accept lighting solutions in the home, where atmosphere, ambience and tasks vary according to the preferences of the individual.30

Cost may be another factor influencing decisions to change lighting; research shows that people with sight loss do not consider lighting when planning house renovation and are more likely to spend money on high-quality furnishings than on improving low light levels.31 In addition, the ability of visually impaired people to carry out everyday tasks varies and may depend on many factors including type of eye condition, its severity, duration and age of onset, as well as lighting conditions. The different causes and effects of sight loss will influence preferred light levels, even among people with the same eye condition. It may therefore not be possible to determine a general lighting solution based on type of vision impairment alone.32

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29 DTI (2001) op. cit.


People with sight loss also choose light levels according to a desire to see small detail, and do not always think of adjustments necessary to optimise distance vision. This may be because of a lack of awareness of lighting options – a common theme in the literature.

Lack of awareness of lighting options

Surveys in the home show that significant numbers of older people accept poor sight as a consequence of the ageing process and do little about it. Improvements could be made with the help of ophthalmologists and opticians or by adjusting home lighting. Many people do not realise the extent of assistance that can be provided by illumination. The degree of knowledge about lighting options among health and social care workers is also variable.

Social and health care professionals may not be sufficiently aware of the implications of improvements to home lighting for people with sight loss. According to Help the Aged, more professional coordination on this issue is needed across these sectors, especially when it comes to preventing falls in the home.

Lighting and future research

Future research areas identified by the RGIE literature review included:

- identifying environmental modifications, such as lighting, and evaluating their ease of implementation, acceptability and use by people with sight loss
- carrying out large-scale work that examines optimal domestic light levels
- conducting further work on how vision impairment affects the negotiation of steps and stairs
- considering the assessment tools of most use to health and social care professionals.

33 Cornelissen et al. (1994) op. cit.
38 Campbell et al. (2005) op. cit.
The research methodology

Methodology and sample characteristics

The three RGIE studies involved the distribution of over 650 questionnaires and the analysis of 206 completed questionnaires, as well as surveys and interviews within 57 homes.

The questionnaire included detailed questions about people’s vision, type of home, existing lighting provision and adequacy of lighting. During home surveys lighting measurements were conducted on walls, floors and ceilings in each room. Lighting surveys were also carried out in communal areas where appropriate, and people were observed in their homes undertaking daytime tasks. The people surveyed were asked to rate the light available when carrying out daily tasks and to give their views about the effects of additions and alterations to lighting, as part of the evaluation of changes made to their lighting.

The 57 homes were all in southern England. Twenty-four independent homes and eight sheltered flats were included in the first two studies. The additional 25 homes in the later study were all Pocklington-owned properties across four sites: an extra-care sheltered housing scheme, a residential care home, a supported housing scheme for people with sight loss, and independent flats managed by Pocklington and rented to tenants who do not need on-site support.

One in six respondents were 85 or over, 42% between 65 and 84, 14% between 55 and 64 and 28% between 25 and 54. The ratio of women to men was 2 to 1, which to some extent reflects the fact that women outnumber men in the higher age bracket. There was a fairly even spread with regard to the length of time respondents had been visually impaired, and impairments covered a range of eye conditions, including macular degeneration, glaucoma, cataract, nystagmus, retinitis pigmentosa and optic nerve dystrophy. Half the respondents were registered blind and nearly a third were registered partially sighted. More than half reported no other condition affecting their ability to move around their home and surrounding area, while 45% reported having at least one other condition in this respect, such as arthritis. Functional vision was assessed through self-reporting of ability to recognise a friend’s face at certain indicated distances, a method previously used by the researchers.40

The functional vision assessment showed that all respondents had some residual vision.

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40 Bright KT, Cook GK (1999) Project Rainbow – A research project to provide colour and contrast design guidance for internal built environments.
**The first and second RGIE studies**

This section briefly discusses the two studies conducted by the RGIE in 2002 and 2003: *Lighting the homes of visually impaired people* and *A survey of 8 flats at Pocklington Rise*.

The first of these studies included a one-year scoping project surveying existing lighting in the homes of visually impaired people, as well as a small practical trial of lighting alterations. During the project over 600 fairly detailed questionnaires were distributed, and lighting surveys and individual interviews were conducted in the homes of 24 people in the south-east of England. Lighting modifications were later installed and evaluated in nine of these homes. Research also involved the production and distribution to all potential respondents of a ‘Useful Information’ booklet containing details of a range of generally available domestic lighting fittings and styles.

The second study provided a survey and assessment of lighting provision in eight Plymouth flats managed by Pocklington, the installation of a range of lighting alterations and a follow-up survey to re-assess the lighting changes and their consequences. This study adopted the same methodological approach as the first.

These two studies produced a number of reports, including one published by Pocklington in its Occasional Papers series.41 The results of the two studies are summarised below.

**Results**

During the first, larger, study, researchers found that surface and task illuminances varied between homes, with very low levels found in some properties. Home surveys showed generally low illuminances across a range of tasks and surfaces, substantially less than guidance recommendations for light levels in residential homes for older people42 or for office workers with visual impairments.43 There were more light fittings in lounges but other rooms were neglected in this respect. Tasks such as reading were often carried out in a low light. Low illuminances were sometimes caused by shadows from poor positioning of light fittings. Subjective ratings of the light levels on surfaces were generally lowest for stairs and landings, particularly on the floor. This is a concern given the prevalence of falls mentioned above.

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42 Julian (1983) op. cit.

43 Cook et al. (1999) op. cit.
Lighting alterations were installed in nine homes. Generic changes included provision of under-unit lighting in kitchens, floor standing uplighters with dimmer switches, to enable more control of lighting, and a range of task lights and bulbs, including energy-efficient lamps. Other additions or alterations to meet individual needs were also provided, including particular types of lampshades to reduce glare. Three-quarters of the trial solutions installed in the nine homes were reported to be very useful and most were favourably rated.

In the second study, of eight flats at a Pocklington site in Plymouth, researchers found very low lighting levels in hallways, poor lighting in walk-in cupboards, and generally low levels of illuminance across most rooms (less so in kitchens and bathrooms). Task illuminance was generally low, again less so in kitchens, and there appeared to be general acceptance of low illuminance task lighting. There was also generally poor external lighting around the site.

Alterations were made in each of the flats to provide:

- individual lighting switches, to enhance flexibility in the use of lighting in lounges;
- additional ceiling lights in L-shaped rooms;
- additional lighting in hallways;
- correct sized shades for compact fluorescent lamps, to reduce glare;
- lights in walk-in cupboards;
- appropriate under-unit lighting in high-level kitchen units;
- a range of task lights to try out.

Objective measurements of the lighting alterations installed in the flats showed that general lighting levels had been increased, as had task illuminances. On a subjective level, tenants were satisfied with the improvements and gave a generally favourable response to each alteration.

An important finding in both these studies was the fact that, despite problems with glare or position of lighting, the majority of people had not considered changing their lighting. The research suggested a variety of explanations: that people did not appreciate that changes to lighting could make a difference, did not know what to do or who to go to for advice, were concerned about the expenditure and the hassle or were satisfied with their existing lighting. Respondents also mentioned problems in accessing sources of alternative lighting because of transport or travel difficulties.
The third RGIE study

The third study, *An assessment and evaluation of the modified lighting provision in 25 homes occupied by people who are visually impaired*, was conducted by the RGIE between 2004 and 2006. Like the earlier studies, it benefited from the involvement of the lighting consultancy firm Lighting Solutions. The study produced a series of progress reports.

A summary of the research findings and recommendations is given below.

Findings

The research team noted problems with poor distribution of light, glare, the control of lighting systems, insufficient light in kitchens and low or uneven light levels throughout rooms.

The team put forward a series of generic recommendations to remedy these lighting deficits, drawn from the findings of the two earlier studies. These included:

- individual switches and dimmer switches to all light fittings;
- shades to prevent glare;
- spacing light fittings around rooms as well as using wall-mounted fittings to provide even light;
- improving lighting to circulation spaces, by ensuring entrances off corridors are adequately lit at all times;
- good-quality portable and adjustable lights that meet RNIB standards.

In the communal areas, research highlighted the usefulness of:

- bulbs that would reduce glare in laundry rooms;
- additional ceiling lights, wall uplights and individually dimmable lights in dining rooms;
- additional task lighting in lounges, to help with reading and other activities;
- dimmable and non-flickering lighting in corridors.

Regarding external lighting, the study indicated that paths, steps and ramps were generally inadequately lit. Residents living in homes with communal areas were generally satisfied with corridor and communal staircase lighting. The research team learned that residents appreciate external lighting, as it helps them gain better views and can be a source of reassurance when moving outside the home. The researchers put forward suggestions to improve
night-time lighting at entrances to homes as well as more even lighting of external areas. These included:

- dawn/dusk outside lighting at the front door with manual override;
- use of bollards and low-level lighting, low glare and general area lighting;
- siting of lights to avoid light and dark patches.

The relevant report detailing proposed lighting changes includes an Appendix with diagrams of properties and recommendations for adaptations to existing lighting provision.

**Lighting alterations and evaluation**

Pocklington also asked the consultancy firm Lighting Solutions to undertake an appraisal of the lighting recommendations for the 25 homes. Lighting Solutions asked each respondent for contextual information about their eye condition, illnesses or difficulties, lifestyle aspirations and interests, as well as ability to carry out tasks such as reading, watching TV and writing. The resulting information provided pointers to the individual’s preferred lighting needs. Lighting Solutions then surveyed each home, noting lighting arrangements and carrying out informal discussions with the resident(s). This appraisal helped ensure that the people surveyed participated fully in the decision-making process and that recommendations for lighting alterations were not only informed by individuals’ preferences, but also related to their particular vision impairments.

Lighting Solutions found that in some cases the proposed changes to lighting would have caused too much disruption. As already noted, this is a factor that can affect people’s motivation to alter their lighting. Lighting Solutions decided, in conjunction with respondents, to recommend economical solutions rather than extensive and costly ones.

As a result of their appraisal, Lighting Solutions noted important factors affecting an appraisal with a remit to promote lighting alterations. These are listed in Figure 1.

The main additions and alterations to lighting in the 25 homes were the provision of:

- new energy-saving lights in hallways;
- mirror shaver lights in bathrooms;
- under-unit lights with covering pelmets and ceiling light in kitchens;
• lounge ceiling lights and freestanding uplighters;
• lights in bedroom wardrobes.

In their evaluation of the lighting additions and alterations in the 25 homes, the RGIE used a mix of methods. The team gathered quantitative data through measurements of illuminances, and qualitative data from interviews that covered respondents’ reactions to the new lighting in general and their views on the benefits and drawbacks of each specific lighting alteration in particular. A questionnaire was also used to gather information from relevant scheme managers about the alterations made to the external lighting.

**Figure 1: Factors affecting appraisal of lighting and possible change**

• Respondents were receptive to ideas about lighting changes if these were simple to explain and understand;
• Respondents were most responsive when interviewers demonstrated precise understanding of their individual needs and when they felt involved in the decision-making process;
• Respondents had often found their own low-tech solutions, so observation of existing lighting arrangements helped inform assessment;
• A qualitative approach helped ensure tailor-made and acceptable solutions.

This evaluation found that nearly four in five respondents believed the overall changes to lighting were successful. The most regularly cited reasons include the increase in quantity of lighting and the control of lighting via dimmer switches. The majority of people interviewed thought they were able to move around the rooms in their home more easily as a result of the changes to lighting. Evaluation reports used case studies to summarise people’s views on their ability to perform tasks as a result of lighting alterations. The major points arising from these case studies are given in Figure 2.

The success and significance of improvements in their domestic lighting, and the effect on quality of life, was clearly signalled when the people questioned used phrases such as ‘over the moon’, ‘great success’, ‘massive improvement’, ‘a 200 percent improvement’ and ‘positive feeling’ to describe their satisfaction with lighting alterations.
In some cases, however, the new lighting was sometimes not used or was thought to have made little difference, chiefly because people relied on their familiarity with domestic spaces along with their routine and modus operandi in their homes. This finding does, however, strengthen the Lighting Solutions advice noted above and indicates that lighting assessment and improvements are likely to be most effective when they reflect individual needs and desires. Respondents valued the opportunity to talk through lighting options with an expert before the alterations were made, and they appreciated the fact that the changes were individually tailored to their needs and preferences.

As far as changes to external lighting are concerned, case studies show that residents found it easier to use and navigate pathways and felt safer because of the improved lighting in the car park and driveways. The importance of external lighting in respect of orientation and safety around the home is also referred to in the study carried out for Pocklington by University College London.44

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Consolidation of common themes

Common themes arose from all three studies in respect of lighting deficiencies, remedies and obstacles to change.

Lighting deficiencies

Illuminance measurements made by the researchers indicate that only a minority of the people surveyed carried out daily living tasks with recommended levels of light. The main lighting deficiencies highlighted in the research are generally low light levels, poor distribution of light, glare and adaptation problems and difficulties with the control and flexibility of lighting systems. Findings are compared with Society of Light and Lighting advice and found wanting. Nine out of ten people surveyed were cooking in kitchens and showering in bathrooms that did not meet recommendations, and eight out of ten were attempting to read in levels of light below those recommended. The studies highlight the need for improved lighting, certainly in hazardous areas such as kitchens and stairs.

About 70% of people who filled in the RGIE research questionnaire reported bumping into objects in the lounge and dining room. Nearly half (45%) of the 206 respondents reported that they trip or fall on the stairs – a high figure and one of concern. A third rated the light level for finding the stair edge as ‘poor’ or worse. The house visits showed that the average amount of light on and around staircases, 47 lux, failed by a large margin to meet the SLL Code requirements of 100 lux. This was the lowest average illuminance across any of the domestic areas in the 57 homes visited. The RGIE also point out that these reported ratings are likely to be underestimates of the incidence of accidents. This is substantiated in other studies that discuss older people’s unwillingness to reveal their vulnerability to falls, as this can damage self-image, publicise frailty and possibly lead to loss of their home.45 46

Deficiencies in lighting appeared to be matched by lack of information available to respondents. The study as a whole identified a need to provide easier access to information about lighting alternatives and to demonstrate the appearance and effects of a range of fittings. The people surveyed tended to rely on family or friends for advice and there was relatively little proactive help in this respect from social care professionals. The studies also confirmed that outside lighting can be problematic and that often

45 Brownsell S, Hawley M (2004) Fall detectors: Do they work or reduce the fear of falling? Housing, Care and Support, 7: 18-24.
there is a need for higher levels of light as well as less glare on pathways, ramps and outside staircases.

**Lighting remedies**

Remedies put forward as a result of the research generally include provision of localised or task lighting to those who find it useful, controllable lighting with individual, preferably dimming, switches and lamps that produce even lighting throughout to assist orientation and movement. Other general remedies, along with those put forward in regard to particular rooms, are included in Figure 3.

**Figure 3: Lighting remedies arising from the studies**

- **Kitchen**
  - Under-unit lights to illuminate worktops, cooker and sink, better shades to reduce glare and shadow.

- **Living room**
  - Wall lights for more even lighting, freestanding uplighters, additional ceiling lights in larger rooms.

- **General**
  - Individual switches, dimmable where possible, good quality portable and adjustable task lights, judicious use of colour in decoration.

- **Bedroom**
  - Wall uplights above bed-head, internal lights in walk-in cupboards, better match between number of fittings and room size.

- **Bathroom**
  - Mirror lights over hand basins, upgrade of shaver lights, more use of low-energy units.

- **Stairs**
  - Use of better-fitting light shades to reduce glare, spot lights that highlight stair edges, high illuminance on landings.
Obstacles to change

Obstacles that stand in the way of visually impaired people making changes to their domestic lighting include lack of information, concern about cost and a view that changes are not worth it in old age. In addition, there is little proactive engagement by professionals, who may themselves lack awareness and require further training on the importance of domestic lighting. Added to this, the RGIE learned that people find their own solutions to lighting deficits through familiarity with domestic spaces, routine and lifestyle. There is resonance here with findings from another study which showed that good lighting can make a significant difference to a person’s ability to understand and ‘read’ their surroundings and move about safely, as long as the lighting is tailored to their personal requirements.47

Relevant social policy – context and implications

There is little research or design guidance on domestic lighting in relation to people with sight loss, and few relevant social policy initiatives that focus specifically on this subject. However, there are social care and housing policies that have a bearing on a number of important issues arising in the research. This is particularly true in the context of innovative service delivery, user-centred assessment and management of falls.

The National service framework for older people48 refers to the need for ‘wider initiatives involving [promotion of] health, independence and well-being in old age’. This accords with a theme in the domestic lighting research, that relevant professionals, services and commercial companies should provide a coordinated response, providing demonstrations of lighting equipment and loaning lighting fittings for home trial before purchase.

The Department of Health49 has also highlighted the need for more specialist staff, with greater knowledge of the needs of people with sight loss, to provide better information and referral for appropriate sources of support.

The Audit Commission Report: *Older People – Independence and Well-being: The Challenge for Public Services*\(^{50}\) states that better coordination between service providers is required. In addition, it lists factors that contribute to people’s sense of independence and wellbeing, including having a safe and comfortable home and keeping busy. As the research has indicated, these are aspects of home life that can be affected for good or bad by domestic lighting.

The Government’s social care Green Paper *Independence, well-being and choice: our vision for the future of social care for adults in England*\(^{51}\) directs service providers to develop a greater focus on preventative services and partnership between relevant agencies charged with providing such services. The Green Paper goes on to say that good-quality services provide people with greater choice and control over the way in which their needs are met. These issues of professional coordination, prevention and promotion of independence all have direct relevance to the potential for visually impaired people to manage and derive maximum benefit from their domestic environments.

The subsequent Government White Paper, *Our health, our care, our say: a new direction for community services*\(^{52}\) emphasises the importance of making it easier for people to obtain the information they need – certainly an issue for people with sight loss as far as knowledge of lighting options and advice is concerned. The White Paper also supports the development of local resource centres so that people can access expertise and support in regard to social, health and housing matters, under one roof. Similar initiatives were recommended in previous work commissioned by Pocklington.\(^{53}^{54}\)

Such resource centres could enable people with visual impairments to access information about lighting options, demonstrations of different types of lighting, and lighting that can be taken home on loan to try before purchase. The White Paper also advocates support that enables people to live independently rather than move to or remain in residential care. In this respect holistic assessment and timely advice on a range of aspects of the domestic environment is likely to be important.

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\(^{53}\) Hanson et al. (2002) op. cit.

Department of Health guidance on eligibility criteria for adult social care\textsuperscript{55} states that appropriate assessment of health and social care needs aims to identify and evaluate individual needs. This is highly relevant in respect of people with sight loss. The three RGIE studies have shown that focusing on individual needs is pivotal in learning of and meeting the lighting requirements of people in their homes.

Standard six in the National Service Framework (NSF) for older people establishes the importance of reducing the number of falls resulting in serious injury and ensuring that appropriate rehabilitation is available. This clearly has implications for people with sight loss, whose stairs and landings, according to the studies, are often poorly lit. A recent report\textsuperscript{56} emphasises the importance of service providers paying more attention to equipment that overcomes barriers to healthy life and healthy ageing. Community equipment, according to the Department of Health website, includes home adaptations such as ‘improved domestic lighting’.\textsuperscript{57}

Government housing policy acknowledges that sustainable materials and energy-saving schemes need to be integral to house building. The White Paper \textit{Our energy future – Creating a low carbon economy}\textsuperscript{58} argues that building standards, lighting and other appliances must continue to improve if households are to reduce their energy use. It says significant energy savings can be made by installing an extra 100 million energy-saving lights by 2010. The White Paper states that domestic energy suppliers will have an energy saving target, to be met by encouraging householders to install energy-saving measures, and that at least half this target must be met in households whose occupants are either on a low income or disabled. Research has shown that such households are likely to include older people with sensory impairments.\textsuperscript{59}

A report prepared for Defra\textsuperscript{60} notes that most households know little about energy efficiency measures, and of those who do many overestimate the costs – an important point highlighted by the RGIE research. The report reveals that lighting gives considerable scope

\textsuperscript{55} DH (2002b) \textit{Fair access to care services: Guidance on eligibility criteria for adult social care}. London: Department of Health.

\textsuperscript{56} DH (2006b) \textit{A new ambition for old age: Next steps in implementing the national service framework for older people}. London: Department of Health.

\textsuperscript{57} DH (2006c) \textit{Community equipment services}. Available via website: www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics accessed 20.8.06.


\textsuperscript{59} Hanson \textit{et al}. (2002) op. cit.

for energy saving, and is likely to account for 11% of the share of potential carbon savings by 2020. The report notes that proposed updates to Building Regulations coming into force in 2010 include a model for reducing emissions by 25%, which translates into the installation of energy efficient lighting in all homes.

There is an intrinsic link between sustainable housing and Lifetime Homes, whose standards centre on designing flexible and convenient homes in which people can continue to live notwithstanding changing abilities.61 62 Through the Department for Communities and Local Government,63 the Government has provided a Code with key elements of design and construction that affect the sustainability of new homes and act as the basis for future developments of the Building Regulations in relation to energy use in homes. The Code measures sustainability of a home against design categories, such as energy, and makes recommendations in respect of internal and external lighting. The Code also includes Lifetime Homes as an area of sustainability design.

By meeting Lifetime Homes standards, developers and builders are able to ensure that Part M requirements of the Building Regulations are met. Part M covers access to and use of buildings and was revised in 2004 with a greater emphasis on the changing nature of people’s abilities and the need to make buildings accessible to and usable by everyone.64 Part L of the Building Regulations is also relevant in that its requirements cover conservation of fuel and power, including energy-efficient lighting in new homes.65 To this extent the Building Regulations guidance embraces notions enshrined in Lifetime Homes Standards but it also dovetails with the Disability Discrimination Act 2005. One way in which the DDA seeks to enable people with disabilities to enjoy greater independence is by addressing their needs for specific adaptations that help create barrier-free environments. The DDA may also encourage policies that directly or indirectly promote equality for people with disabilities or impairments, as well as encourage providers to ask

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their users about levels of satisfaction with goods and services.\textsuperscript{66} Such outcomes have the potential to address and improve lighting as an important feature of daily life in the homes of people with sight loss.

The RGIE research acknowledged that more work needs to be done if domestic lighting is to have the policy recognition it merits. The value of the research, and its limitations, is the next focus of this paper.

**Value and limitations of the RGIE studies**

In considering the value of the three RGIE studies discussed in this paper, as well as their limitations, careful note has been taken of the studies’ declared aims and their achievements, the comments of two independent evaluators who reported to Pocklington during the research, and the RGIE’s own reflections on the body of work.

**Value of the research**

The literature review highlighted relevant demographic details and confirmed that there had been relatively little work on lighting in ordinary homes and even less focusing on the needs of people with sight loss. The review therefore clearly established a rationale for concerted work in this area. It also brought together literature that spans domestic lighting, sight loss and falls, providing a comprehensive appraisal of outputs and findings.

Given the paucity of research on domestic lighting and its relevance to the daily lives of people with sight loss, there is no doubt that the studies carried out for Pocklington by the RGIE between 2002 and 2006 constitute the largest appraisal of its type in the UK and contribute significantly to the body of knowledge on the subject. The reports arising from the studies suggest that further research is needed and helpfully indicate particular strategies in this respect.

Research has highlighted factors that affect people’s willingness to alter lighting that is inadequate. It has identified the importance of person-centred lighting appraisals that promote confidence and informed participation by the individual concerned. The RGIE studies went some way in developing such appraisals, through the combination of quantitative and qualitative methodologies. The studies provide a solid basis, therefore, for mixed-method research that seeks to explore user perspectives.

The studies have also shown that people with sight loss typically have insufficient knowledge about lighting options. This finding should prompt relevant agencies to seek ways to inform their service users and the wider public about the benefits of different lighting options and to find ways to meet people’s individual lighting needs and preferences.

The research included demonstrations in the form of trials in people’s own homes. A most worthwhile outcome of the research has been the finding that such practical demonstrations of potential improvements to lighting are welcomed and make a difference to people with sight loss and thereby make a valuable contribution to home improvements. The RGIE studies also revealed that lighting improvements make a potential contribution to safety in the home, with data that quantifies and distinguishes between incidences of bumping, tripping and falling. The research provides a foundation for further work examining in detail aspects of risk in the home and the ameliorative role of lighting.

**Limitations**

Limitations of the body of work under consideration in this paper chiefly relate to research methods and breadth of analysis. The questionnaire was long and rather complex and the response rate of a little over a quarter was lower than hoped for.

There was little opportunity within the RGIE studies to explore the variables that may affect people’s needs, preferences and attitudes to domestic lighting. Such analysis would be useful and seems necessary, if we are to understand more fully the range of individual needs and priorities in respect of domestic lighting.

These limitations do not significantly affect the reliability of the research, which as a whole constitutes a fruitful initial exploration of a neglected topic, and as such reveals a number of implications for further research and development.
Implications for further research and development

Further research is indicated in respect of:

- The effects of various eye conditions and other key variables, such as age, housing circumstances and severity of sight loss, on lighting needs and preferences.
- The link between lighting and the prevention of falls.
- Domestic lighting in a greater number of homes and in homes with a greater mix of rooms, so as to probe complexities and additional needs and solutions.

Design implications of the studies include:

- Manufacturers of kitchen equipment should consider designing lighting as an integral part of units and cupboard spaces, ensuring that light sources are shielded to reduce glare;
- Designers and architects need to consider optimum placement of light fittings and the inclusion of a greater variety of lighting fittings.

Good professional practice will be enhanced by:

- Health and social care professionals gaining more awareness of lighting needs and solutions and receiving adequate training.
- Relevant staff ensuring that visually impaired people receive good advice about and ready access to a greater choice of domestic lighting options.
- Rehabilitation work and assessment that routinely includes the subject of domestic lighting.
Codes and Guidance need to consider:

- The formulation of illuminance recommendations for existing and newbuild domestic private dwellings, particularly in regard to kitchens and stairs.

- Relevance of the research studies to the proposed Housing Health and Safety Rating System (HHSRS), which identifies lighting as a key environmental variable affecting potential hazards in the home. The current HHSRS does not deal with the needs of older people or people with disabilities but could be extended to do so, providing a tool to assess risk within the home for certain groups.

- Relevance of the research studies on domestic lighting to the English Housing Condition Survey, which could include questions about lighting within the section on accessibility for older people and people with disabilities.

- The potential for relevant findings from the research to be included in amendments to British Standards Institute codes of practice on building design.
Conclusions

The studies discussed here add weight to the argument that artificial domestic lighting is an important aspect of daily life for people with sight loss. This contention was suggested in a larger-scale and more generalist study of visually impaired people’s housing and support needs, which found that the minority of people surveyed who had made any domestic modifications as a result of sight loss had done so chiefly in respect of lighting. The RGIE studies for Thomas Pocklington Trust go further than flagging up the issue of domestic lighting. These studies make a strong case for lighting to be seen as a feature of the home that can quite readily be modified to great effect, and one that can enhance visually impaired people’s quality of life, safety and better management of everyday tasks.

Domestic lighting is increasingly on the agenda of rehabilitation workers and occupational therapists but needs greater attention from other relevant professionals as well as the wider public. The studies reviewed here will help in that respect.

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67 Hanson et al. (2002) op.cit.
References


Bright KT, Cook GK (1999) Project Rainbow – A research project to provide colour and contrast design guidance for internal built environments.


How to obtain further information

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Copies of this report in large print, audio tape or CD, Braille and electronic format are available from Thomas Pocklington Trust.
Background on Pocklington

Thomas Pocklington Trust is the leading provider of housing, care and support services for people with sight loss in the UK. Each year we also commit around £600,000 to fund social and public health research and development projects.

Pocklington’s operations offer a range of sheltered and supported housing, residential care, respite care, day services, home care services, resource centres and community based support services.

A Positive about Disability and an Investor in People organisation, we are adopting quality assurance systems for all our services to ensure we not only maintain our quality standards, but also seek continuous improvement in line with the changing needs and expectations of our current and future service users.

We are working in partnership with local authorities, registered social landlords and other voluntary organisations to expand our range of services.

Our research and development programme aims to identify practical ways to improve the lives of people with sight loss, by improving social inclusion, independence and quality of life, improving and developing service outcomes as well as focusing on public health issues.

We are also applying our research findings by way of pilot service developments to test new service models and develop best practice.

In this publication, the terms ‘visually impaired people’, ‘blind and partially sighted people’ and ‘people with sight loss’ all refer to people who are blind or who have partial sight.
Notes