
Can the number of fire-related incidents in sheltered accommodation be attributed to the existence of a safety culture?



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1. Abstract

Research into fire-related incidents is based purely on figures and information obtained from the fire service involved. This is usually in the form of statistics based on demographics and not personalities or attributes of the people involved. This research set out to discover if the number of fire-related incidents in sheltered accommodation can be attributed to the existence of a safety culture. In other words, is there a relationship between people's behaviour and attitude towards health and fire safety and the likelihood of them being exposed to a fire-related incident.

Managers and residents of sheltered accommodation blocks (known as schemes) were asked to complete a safety culture questionnaire in order to establish if a safety culture can exist in a domestic environment. The data collected was then compared to the number of fire-related incidents that each scheme experienced over a given period. For the purpose of simplicity, this research uses the term 'fire-related incident' to encompass all incidents that involve the activation of the building automatic fire alarm.

Fire incident data from a selection of sheltered schemes was analysed and compared to the safety culture data to identify any trend. An attitudinal survey in the form of a multiple-choice questionnaire was used to ask the both the managers and their residents questions.

Analysis of each scheme's incident recording database confirmed that nearly all fire-related incidents were as a result of residents cooking in their own flats. This research concludes that a different approach may be required to establish if there is a relationship between the number of fire-related incidents and a safety culture, but significantly the research does indicate that there are safety related cultures in sheltered accommodation blocks. The research also indicates that the main reason for fire-related incidents is due to cooking and recommends further research into

identifying underlying root causes, therefore possibly reducing the amount of fires that start in residents' own kitchens.

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5. Abbreviations

AIMS	Accident and Incident Management System
ARC	Alarm Receiving Centre
FRA	Fire Risk Assessment
FSIO	Fire Safety Inspecting Officer
FSO	Regulatory Reform (Fire Safety) Order 2005
FRS	Fire and Rescue Service
HSW	Health and Safety at Work etc Act 1974
HSE	Health and Safety Executive
LGA	Local Government Association
NFCC	National Fire Chiefs Council
OSH	Occupational Safety and Health
RP	Responsible Person
RSL	Residential Social Landlord

6. Introduction

Fire safety in England has been headline news over the past few years and for all the wrong reasons. Fire fighter training is ongoing and developments in firefighting technology is a massive global business, yet still the number of people who are being killed or seriously injured by smoke or fire in domestic environments is far too high. Recent fires in high rise towers highlighted how things can go wrong if the poor decisions are made, or preventable action is not taken. Sheltered accommodation, the focus of this research, is not like other housing types. It is predominantly independent living where people live together under one roof, but in the privacy of their own flat. People move into sheltered accommodation to retain their independence, and hopefully remain there for the rest of their lives. Residential social landlords, know that their buildings will be home to some of society's oldest and most vulnerable people. In theory then, sheltered accommodation should be one of the safest places in the country to live. However, deaths due to fire do still occur in sheltered accommodation which is the reason for this research being carried out.

The research took place entirely within sheltered accommodation schemes owned and managed by one not-for-profit residential social landlord (RSL).

A typical sheltered scheme comprises of a number of individual flats, a manager's office, and shared facilities such as a communal lounge and kitchenette, with additional rooms such as libraries and hair salons. Schemes are safe places to live, but they do have '*risk rooms*', rooms that are inherently dangerous due to what's inside them. These include the boiler rooms, lift motor rooms, electrical intake rooms, and service risers that house gas pipes or electrical equipment. It is for this reason that fire safety is paramount in schemes as the potential for fire

and or smoke to spread to these rooms could protract a fire incident putting the whole building at risk.

Each individual flat has an alarm system comprising a speech unit and a pull cord in each room.

This is typically known as a ‘warden call’ system. A typical flat will have a smoke detector in the hallway and in the lounge, both of which are connected to the building’s fire alarm system.

Some flats will have additional detection in the form of heat detection in the kitchen and possibly smoke detection in the bedroom(s) but this is usually as a result of a risk assessment of the resident who lives in that particular flat. When they are on duty all fire alarm activations will go to the manager via the intercom system in their office or via a handset that they carry around with them when on duty. The system is also connected to an Alarm Receiving Centre (ARC) so when the manager is off site a trained operator will receive and manage the call and, if necessary, make the call to the relevant emergency service.

This research has been carried out using a sample of schemes that reflects a cross-section of a typical residential social landlord’s portfolio.

The organisations’ housing locations are supported by five area health and fire safety advisors who all report into the national health and fire safety advisor. The national advisor reports to the organisation’s head of health and fire safety who in turn reports to the director of housing. An organogram to illustrate this is provided at Appendix 1.

The author of this research spent nine years in the fire service; six of those years as a fire fighter before becoming a fire safety inspecting officer in the London Fire Brigade for a further three years. Now working as an area health and fire safety advisor for the organisation in which this

research is undertaken, the author is responsible for advising and supporting managers in over 130 sheltered housing schemes and has first-hand experience of how fire can impact the people who live in retirement accommodation. The author is passionate about fire prevention and believes that additional research into the cause of fire in sheltered accommodation is needed in light of the recent deaths over the past five years in such schemes.

Some 13 years ago the way that fire safety was managed changed with the coming into effect of the Regulatory Reform (Fire Safety) Order 2005 (FSO) on the 1st October 2006 and was designed to encompass the 80 references to fire safety legislation in existing Acts of Parliament. Prior to the FSO, the Fire Precautions Act 1971 was the main legislation but relied on codes and guidance documents for methods of achieving compliance. The FSO introduced the concept of managing fire safety by way of addressing the significant findings in the fire risk assessment (FRA). The FSO is enforced by the Fire Safety Inspecting Officers (FSIO) of local fire authorities. FSIO's inspect all buildings that fall under the scope of the FSO ensuring compliance with the regulations. Over time the role has developed and today's inspectors are given additional training with regards to developments in engineering solutions, modern methods of construction, advancements in automatic fire detection, different types of active fire protection such as sprinkler systems, and passive fire protection such as fire doors, but the concept of a 'culture' is not included in the training as housing is only 1 type of the many buildings that FSIO's will inspect. This relatively unexplored subject, if investigated, could provide some interesting results and opportunities for further research to those interested in fire safety in the domestic setting and possibly indicate that the business of carrying out fire inspections and FRA's could benefit from analysing the population as well as the building.

For social landlords with large portfolios, and fire authorities with fire safety inspection programs, any trends that will help identify higher than normal fire risks will possibly help with their planning for fire prevention and potentially save lives. The reason for asking if a culture can exist is in response to the increasing demands being put on fire authorities in terms of their need to identify high risk groups of people and their obligation to take appropriate action in order to ensure their safety. If fire authorities, or the person responsible for carrying out the FRA of a particular building, can assess the people as well as its structure, it may be possible to give the building a more accurate risk rating.

All fire safety statistics state that the older population are most at risk of injury or death from fire but do not clarify why this is the case. The Home Office (2017) statistics confirm that older men are more likely to be involved in a fire. This suggests that there are things that older men do that women do not do that puts them at greater risk which in turn suggests there is a cultural difference between men and women of a certain age that affects fire statistics. There may be many explanations but available national statistics, whilst categorising fire-related incidents, do not examine the root causes. Such an analysis may provide significant information that would further aid fire prevention therefore reducing the number of fire deaths each year.

There is a wealth of information and research on safety culture in the workplace, but little or none that discusses residential accommodation, specifically, sheltered accommodation.

According to Smith and Wadsworth (2009:8) *'It is now generally accepted that organisations with a strong safety culture are more effective at preventing workplace accidents and injuries.'*

This applied research investigates whether or not a similar phenomenon can exist in a domestic environment. If a culture can exist, then there must be a relationship between management and subordinates. In housing schemes there are no subordinates, only residents. Residents are not

employees and managers are on site to support them, not to maintain discipline or any type of work ethic. This means that there are occasions where managers find it difficult getting the residents to comply with the scheme rules.

The sample population are residents living in sheltered schemes and their respective scheme manager. The single private dwellings within sheltered housing schemes are sometimes a mixture of rented and leasehold flats. For the purpose of this research, the sample population will be residents living in rented accommodation only, who for ethical reasons, do not have any known mental health issues.

By conducting interviews and carrying out a survey, this research will further examine:

- if the scheme managers' responses are illustrative of those leading a safety culture
- if the residents' responses indicate that they are willing participants of a safety culture
- if the scheme managers' responses reflect those of the residents
- if a safety culture can be identified as either positive or negative, could this information be incorporated into the building's FRA.

The tenancy agreement, signed by the resident when they move into the building or take over a new flat, includes a number of generic scheme rules. For example, 'Clause 20 Fire Exits' states *'You must not obstruct or prevent someone from using the fire exits, or fire evacuation routes at the scene.'* and Clause 21 Communal areas states *'You must not obstruct or leave or store any items in the communal areas without our permission in writing...'* In a commercial environment, a manager could use a disciplinary process against any employee who ignores such rules, which could eventually result in dismissal for repeat offending. In a domestic environment, the equivalent to dismissal would be to make someone homeless. This is not a realistic or morally

acceptable outcome, so the manager relies on their communication skills and the willingness of the resident to cooperate in order to maintain a safe, compliant scheme.

A selection of managers will be asked attitudinal questions to determine how they, as the person in charge of the building, manage health and fire safety, and how they think their residents respond to scheme health and fire safety rules.

The residents will be asked similar attitudinal questions. As with the managers, all of the respondents' answers will be examined to see how they respond to health and fire safety rules. These responses will form the basis of the research.

This thesis is laid out in such a way that the reader will be able to skip to any relevant chapter and gain an understanding of the specific element of the research. The aims and objectives provide an overview of the purpose of the research and how it was achieved. The literature review contains information specifically related to the three subject matters of the research question. Organised chronologically, the literature review lays the foundation and sets the scene for the research. The first chapter will discuss sheltered accommodation today and its origins. The second chapter examines the term 'safety culture', i.e. what it is, and where the term originated. The third chapter discusses fire safety statistics and FRA.

In the methodology chapter, all aspects of the research itself are explained, including the type of research methods used, the environment in which the research took place, and who the research was based on. The 'Results and Discussions' chapter contains the outcome of the research and provides all the data and discoveries whilst looking at them in detail and evaluating their worth. The 'Conclusion' chapter gives an overview of the success of this research, discussing any relevant findings that the reader may find useful. The 'Recommendations' chapter discusses possible further research into areas not covered by this paper. Part 1 suggests possible areas for

change for the organisation based on the findings of this research whilst Part 2 suggests possible further research that may be relevant to this thesis.

7. Aim and objectives

Aim:

The aim of this research is to investigate if the number of fire-related incidents in sheltered accommodation can be attributed to the existence of a safety culture.

Objectives:

- Examine previous research by way of a literature review to determine what research can be applied or utilised for this research.
- Identify the root cause of fire-related incidents in sheltered accommodation.
- Determine if there is evidence of any attitudinal culture in a sheltered accommodation scheme that could have an impact on health and fire safety compliance.
- Determine whether or not a culture can be a positive or negative safety culture as commonly defined.
- Investigate whether there is a relationship between the population in a scheme and the number of fire-related incidents.

8. Literature review

At the time of this research there was an ongoing investigation into the Grenfell Tower tragedy that cost the lives of 72 residents on the 14th June 2017. It is important to note that all citations, statistics and data that were collected from external sources predate the Grenfell Tower fire. Grenfell Tower was a general-purpose block of flats, meaning there was no criteria for eligibility. It is a different type of living accommodation from sheltered accommodation. The occupancy type and the building design is entirely different to a sheltered accommodation block and therefore has no relevance to this research. More significantly, during the time this research was conducted and results written, the Grenfell enquiry was still ongoing and it would be inappropriate to refer to it in this thesis.

Chapter 1 – Sheltered accommodation

The government came up with the initiative of sheltered housing. Oldman (1990:24) discusses the origins of sheltered accommodation when she states '*Local authorities began developing sheltered housing for rent in the mid-1960s. The provision of sheltered housing was actively encouraged by central government at this time.*' This initiative was in answer to the fact that older people struggle to live independently in their own homes and in many cases require additional support. According to Oldman (1990:23) '*at the end of 1989 there are unlikely to be very many more than 500,000 sheltered housing units in England and Wales of which about 50,000 are in the private sector.*'. This figure is shifting today as more private landlords are taking over existing schemes or building new ones.

The demographic of people living in sheltered accommodation is varied and in many schemes the population living in them are not the demographic they were originally built for. With their

facilities, and the benefit of either a live-in or visiting warden, sheltered schemes were perfect for older people that would require some assistance and support in order for them to maintain their independence. This would include the pull cord system for emergencies that was a speech unit linked to the warden's office or flat. But more and more schemes now house a large number of people that do not require any assistance and therefore are possibly living in a building for which they are not suited. Oldman (1990:41) refers to previous studies by Fennel et al (1985,1986) which showed that *'people move into sheltered housing more for housing and housing related reasons than for social and care reasons.'* A point echoed by Oldham (1990:13) in a statement relating to her own research when she says *'a majority of people in this sample moved simply to seek better or more appropriate housing. Only a minority explicitly sought the care services of wardens...'* Both points indicate that sheltered housing is viewed by many people as *'Planning for the future'*.

This indicates that the warden was often faced with some residents that did not want their services, and other residents whose needs were too great compared to what the warden could provide.

The role of the warden was to be a 'good neighbour' to all the residents living in the scheme they managed. According to Oldman (1990:107) *'Wardens can exercise considerable power and influence especially in new schemes. Their success in welding a scheme together can be measured in residents' satisfaction or the converse.'* This may be true, but there will be schemes where, irrespective of how successful the manager could be, the residents may still not be compliant. There are now residents' associations in some instances created to act as a union with the chair person being the equivalent to a shop steward. This can benefit all parties, but it can also have a detrimental effect on the overall atmosphere of a scheme.

Living in sheltered accommodation is also referred to as communal living. This is often interpreted as persons of a particular age range living together as a cohesive unit. The words community, communal, and commune all have a common base, but researchers and philosophers have long debated the meaning of the words and how they are used in today's society.

Delanty (2009:11) states that the word community '*derives from the Latin word com (with or together) and unus (the number one or singularity)*' and that '*the idea of community is related to the search for belonging in the insecure conditions of modern society...*'. Lucksinger (2016:11) appears to agree when he states '*The majority of species exist in some form of community. Most do so instinctively because survival dictates this form of living necessary to existence. Human beings began with tribes, small communities, and/or large extended families; they experience some form of commitment and desire to unify as a whole.*' - both inferring that the word community is a choice. Communal living in today's society can provide the benefits associated with 'strength in numbers' giving people safety and a sense of security that living alone for some people, does not.

Whilst it is called communal living, the reality does not necessarily reflect this as many people choose to live independently of their neighbours or their new home is not one in which they feel they are able to be 'neighbourly'. According to Shelter (2013) '*The benefits of moving to sheltered accommodation can include improved health and alleviation of stress and worry. Conversely, some people find they have to move away from their local area and can become more isolated and potentially vulnerable*'. As a consequence of the potential isolation, the changing behaviour of some people in sheltered accommodation, due to a variety of factors such as age or worsening health conditions, may not be noticed by people perfectly placed to help them if this should happen to them.

Chapter 2 - Safety Culture

The phrase 'Safety culture' is somewhat of a phenomenon in itself in that it is a phrase commonly used but one that is widely recognised as being misinterpreted or never formally, precisely defined. According to the International Nuclear Safety Group (INSAG) (2011) the term was first used in the summary report into the incident in 1986, and again in 1988, in both cases *'the term was left open to interpretation and guidance was lacking on how Safety Culture could be assessed.'* INSAG (2011) does state in their report the first definition of safety culture as being an *'assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.'* More significant is the explanation given for this definition that *'This statement was carefully composed to emphasize that Safety Culture is attitudinal as well as structural, relates both to organizations and individuals.'*

The health and safety department in a housing organisation can assist, but the manager is the only person that can help or encourage the residents to act sensibly and live safely. The managers therefore require the right attitude as well as common sense and people skills. This is possibly where the difficulties of keeping a sheltered scheme safe lie, as it cannot be said that all managers, in any industry necessarily all have these qualities and attributes.

Much of the literature on safety culture discusses buy in from management, and a willingness to engage throughout the many layers of an organisation. They typically examine cooperation, and leadership at all levels. However, housing is not a workplace for the residents; there are no tiers, no structure. It is simply a manager, and a group of individuals that cohabit the same building, sometimes through necessity, not choice. Cooperation can be encouraged, but not enforced.

Managers are there to help residents live independently, not tell them how to live. Furthermore, a scheme manager does not have the powers of a commercial manager in a commercial working environment. A manager cannot take disciplinary action against a resident for putting their own life at risk.

The relationship between accidents and culture was discussed by Collins (2002:03) '*Lord Cullen's inquiry into the Ladbroke Grove rail accident in 1999 (Cullen, 2001) paid much attention to the role of safety management and culture within the rail industry. The inquiry pointed to evidence which suggests that a large proportion of accidents, incidents and near miss occurrences follow from unsafe acts that are a result of underlying deficiencies in safety management. Thus, the inquiry emphasised the link between 'good safety and good business'.*

Whilst the point is true, a more sympathetic link would possibly have been that between 'good safety and little or no loss of life' as Lord Cullen's report discussed the lost finances potentially as a way of highlighting the importance of performing a thorough cost benefit analysis for all aspects of the business.

In their research paper into safety culture the HSE (2005:03) states '*The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management.*' This is a significant statement, one that acknowledges that a safety culture in an organisation is purely a voluntary phenomenon. The HSE (2005:03) adds that '*inquiries into major accidents such as the King's Cross fire (Fennell, 1988), Piper Alpha (Cullen, 1990) and the Herald of Free Enterprise (Justice Sheen, 1987) have found faults in the organisational structures and safety management systems, throwing the importance of safety culture into the spotlight.*'

In later reports into disasters, the term ‘safety culture’ is also discussed. Stranks (2006:131), an established author of health and safety guidance books, quotes Rimmington (1989) when listing the six principles required for establishing a safety culture. The list includes ‘*systemic identification and assessment of hazards and the devising and exercise of preventative systems which are subject to audit and review; in such approaches, particular attention is given to the investigation of error.*’ and ‘*promotion and reward of enthusiasm and good results.*’ Whilst suitable for most workplaces such as factories and warehouses, the ‘assessments of hazards’ to which Rimmington refers to are not so straight forward or in many cases, practical in sheltered accommodation. Whilst managers can undertake risk assessments of all communal areas, scheme managers are not permitted to enter residents’ flats (where most incidents occur) at will to carry out inspections, and more significantly, sheltered accommodation is independent living so in principle they should not need to. The principle of ‘*promotion and reward*’ is also beyond the remit of a housing manager as managers are not in the position to reward residents for ‘living safely’.

Stranks (2006:132) also quotes the CBI (1991) list for developing a safety culture. The list which includes ‘*Incidents should be thoroughly investigated*’ and ‘*Deficiencies revealed by an investigation or audit should be remedied promptly*’ relies on the cooperation of the resident and the ability of the manager to make changes within the resident’s home. Both are unlikely to happen due to the complexities that surround managing persons not employed by the landlord. Though these examples are from the book entitled ‘*An essential guide for managers*’ there is a common trend in health and safety and fire safety literature in that much of what is published gives advice and guidance, or states what is a legal requirement or best practice, but does not consider the possibility that the reader does not have the knowledge or ability to follow the

advice, nor do these guides discuss varying conditions where these situations may occur and this can lead to no action being taken at all.

It is now a widely accepted fact that organisations with a positive safety culture have a lower incident rate than their competitors who do not. In their research report Wadsworth and Smith (2009:08) state that *‘Corporate safety culture – which describes shared values in an organisation that influence its members’ attitudes, values and beliefs in relation to safety – is now generally accepted as having a strong influence over workplace accidents and injuries. When an organisation that is suffering a high number of health and safety related incidents, implements a change led from the top down, to improve conditions and the overall health and safety standards, incident rates reduce dramatically.’*

IOSH (2017:2) states that *‘Safety culture has been defined as consisting of shared values (what is important) and beliefs (how things work) that interact with an organisation’s structure and control systems to produce behavioural standards (the way we do things round here).’* This appears to confirm the acceptance that a safety culture is wholly purposeful. Whilst this may be the case it could be argued that there are factors completely unrelated to the environment that are the driving force behind the climate of the safety culture such as the age, ability and skill set of the workforce.

Measuring the level of a safety culture

When discussing the methods of establishing whether a culture exists Carroll (1998:275) suggests *‘the very act of conducting a survey constitutes an intervention-a signal sent to the department about the safety culture. People are likely to wonder what is happening, how they can help, and how it will affect their work and their employment.’* Similarly, the MBA Learner

describes Landsberger's opinion regarding an experiment that involved observing workers inside Hawthorne Works factory between 1924 and 1932 when they say '*...the increase in the activity level of workers was due to the fact that they were motivated by the idea of being observed (Hawthorne Effect). The attention of the researchers on the workers made them to do their best at work each day cumulating to an overall increase in the factory's production. Henry A. Landsberger called this change in behaviour due to awareness of being observed 'The Hawthorne Effect' in 1958.*

Both then seem to suggest that the act of trying to assess the level of a culture may in itself affect the validity of the results.

In their journal article, Warszawska & Kraslawski(2015:01) state that '*It is a generally accepted fact that the level of safety culture has to be continuously evaluated and improved to avoid the occurrence of such situations in the future*' and in response to this belief introduced in their journal a new method that they call the Assessment Tree Method which allows '*for quantitative estimation of the level of safety culture in an organization*'. The article illustrates the use of algorithms and algebra to quantify this new methodology and so reads more like a science journal than a health and safety tool. This methodology is possibly too complex for most situations and there is no supporting evidence in their journal to support that this is a suitable tool for evaluating and improving a safety culture. It is an interesting concept though to attempt the task using mathematics. Interestingly the authors also incorrectly attribute the phrase 'safety culture' to being first coined by the International Nuclear Safety Advisory Group (INSAG) in the International Atomic Energy Agency (IAEA) 1991 report into the 1986 nuclear disaster at Chernobyl which raises the question as to how much research went into the problem before deciding this was a suitable solution. This method is also called into question by Filho and

Waterson (2018:01) who quote Antonsen (2009b), who himself *‘compared qualitative and quantitative descriptions of the safety culture in the same organisation (a Norwegian oil and gas platform) and found them to be dramatically different, leading him to cast doubt on the predictive validity of safety culture assessments.’*

This research is similar in nature in as much as it asks the question about safety culture in sheltered housing and looks for evidence linking good or bad management to the number of fire-related incidents within it. Considering Antonsen’s findings, it may be plausible to suggest that should a ‘safety culture’ in housing exist, then it should be defined and measured by another method or tool altogether.

Chapter 3 – Fire Safety

Fire safety is an all-encompassing name for the guidelines and practices intended to prevent fire starting, and protect from fire if one starts. When discussing fire safety, the main topics would include the environment such as the building type, its use, and its construction, and the people who may be affected and any special considerations in regards to specific people’s individual needs.

Whilst many authors recognise the importance of managing health and fire safety in housing, few, if any, actually give any advice or guidance on how this should be done. According to Reeves (2005:47) *‘The management of social housing is a central housing function. There are two key aspects to it – first the management of the people in the dwelling, and of the property itself.’* Significantly he goes on to state that the management of people (the first key aspect) includes *‘enforcement of contractual and statutory tenancy conditions, ensuring that homes are*

properly looked after by those who live in them...' There is no mention of health and safety or the importance of managers demonstrating safe behaviour and promoting living safely. What Reeves does not state is who he believes is the person responsible for ensuring that homes are properly looked after, and more importantly, there is no definition of 'properly looked after'. This is a similar point made by the Local Government Association (LGA) (2012:34) which states one of the key points of fire safety law in blocks of flats is that '*all residents of flats need to be aware of the importance of maintaining in place the fire safety measures required by legislation at the time of construction of the block. Alterations by residents within their own flats may not only put those residents at risk, but also other residents in the block.*' Despite the fact the intended reader of this guide includes scheme managers, it does not include any information that illustrates what is meant by an '*alteration*'. This is an oversight as it's a well-known problem in housing whereby residents remove kitchen doors and replace others with doors that may not be fire doors.

One person's living standards differ to the next and this is a crucial fact that this research seeks to examine. A key point about sheltered accommodation is that it is classed as 'independent living' meaning although the residents live in a communal block, they do so independently. A scheme manager is on site to assist, signpost and help those with needs to sort out necessary arrangements. A support function, but one that allows the residents to maintain their independence.

In their guidance document the LGA (2012:19) states that '*In England around ten per cent of the population live in a purpose built flat. Yet during 2009-2010, around 25 per cent of dwelling fires occurred within purpose-built blocks of flats. As a result, in that year, 23 per cent of all fire deaths in dwellings occurred in these blocks.*' Which would indicate that 77% of fire deaths

occurred in other types of properties. What is not explained is why a disproportionate number of fires occurred in flats. Such statistics leave the reader open to make their own assumptions as to the reason but further investigation into the root causes may determine that in some cases the construction or layout of the property are a significant factor. An example for consideration is the size of a typical kitchen in a flat, in comparison to a kitchen in a house. There may be more room for the occupier in a house to take action that avoids a fire, but the confines of a flat may mean this is not an option and so a fire develops.

According to statistics published by RiscAuthority (2015) in the months between January 2012 and December 2013 less than 2% of all dwelling fires occurred in sheltered housing. This would indicate that sheltered housing is very safe in terms of fire safety. Additionally, the report states that 44% of all those fires were deliberately started.

According to the Home Office (2017) *‘The risk of dying in a fire is not uniform across all age groups or gender. Generally, the risk of fire-related fatality increases with age, with those aged 80 and over at by far the greatest risk of dying in a fire. Men are at almost twice the risk of dying in a fire as women for all ages from 25 and above, while men in the 65 to 79 years old bracket are at 2.2 times the risk of women in the same age bracket.’* Why men should be more likely to die from fire is not explained. It may be because more men live alone and are therefore more likely to be involved in a fire situation. An explanation would go some way towards better educating housing providers with regards to what makes certain people more vulnerable than others.

Figures from the Fire and Rescue Service’s Incident Recording System (IRS) clearly show that with age comes vulnerability to fire situations. Figures from the Stationary Office (1997) cited in

National Fire Chiefs Council (NFCC) (2017:30) state that in single occupancy homes, there was one death per year for every 309,000 people aged 18-59. For the same duration, in sheltered housing, there was one death for every 48,000 people. This further equates to one death per 180,000 single occupancy homes, but one death per every 15,000 sheltered housing dwellings.

There are variables to fire statistics that are collected. When a person died, or the cause of death may be open to debate. An example could be that of an elderly person who was rescued from a flat fire and a few days later died in hospital due to medical complications caused by the smoke they inhaled. This may not be then recorded as a fire death even though the fire was the root cause of the death.

The NFCC (2017:32) state *‘In sheltered housing, the numbers of fires and deaths from fire are disproportionate to the number of sheltered housing flats and the number of people who live in sheltered housing. This demonstrates the high risk from fire for occupants of this type of premises. The greatest risk of death is for those in the room in which fire starts; often those in the room are directly involved in the fire (e.g. their clothing or bedding is the item first ignited). This establishes the need for a person-centred approach, tailor made for each resident who is highly vulnerable.’*

This statement may be slightly misleading if not analysed. Stating the ‘greatest risk of death’, is not the same as saying ‘the most common cause’. It is intended to illustrate that the closer the occupant is to the seat of the fire, the more likely they are to be at risk, but it does not state where the most likely place one can expect a fire to start. In which case it could be said that the ‘greatest risk of death’ has little to do with being in the room in which the fire starts, but the inability to walk away from an ignition source that has come into contact with materials that it

should not have. According to the NFCC (2017:32), figures from the CLG (2009) show that 2% of all housing stock in England is either sheltered or extra care housing. And yet additional data from the IRS shows that in the years 2010 – 2016 around 7% of all dwelling fires occurred in these buildings. They add that around 1.1% of people live in sheltered housing yet nearly 5% of all fire deaths occurred in dwellings of this nature.

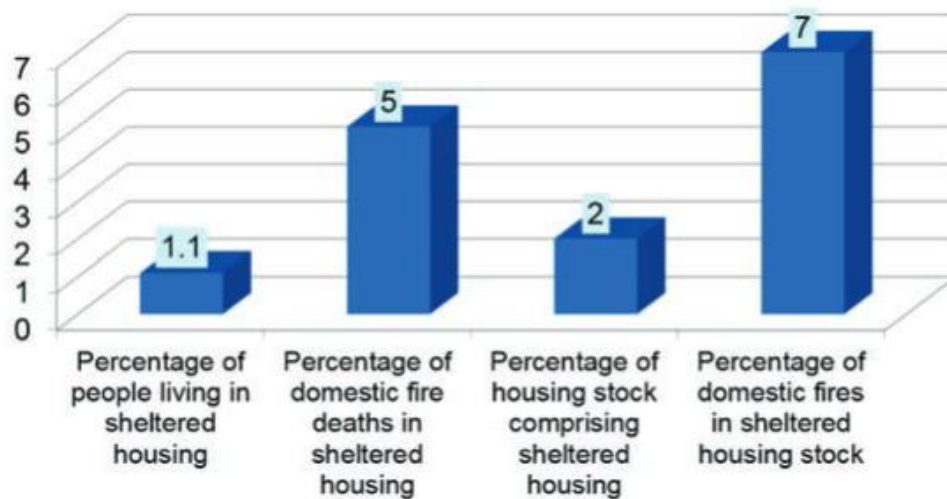


Figure 1: Relative Risk in Sheltered Housing. Source NFCC p32

It is not clear why current fire data is being assessed against 9-year-old housing data but this point is not being made. This is a common trend in much of the literature available. As with the fire death statistics, it is unclear why the guidance document is using data that is 20 years old to highlight the number of deaths in housing.

Fire Risk Assessment

Fire safety standards are measured against the articles of the FSO and this is possibly where enforcement does not go far enough, or in some cases, the process of enforcement goes too far. As fire safety risk is based on the likelihood that a fire may start and severity of any potential fire, enforcement is generally the opinion of the enforcing fire safety officer. What one officer

perceives to be a great risk and therefore needs immediate corrective action, another may perceive the situation to be a well-managed risk. This level of disparity illustrates in many cases a lack of understanding in regards to fire risk assessment. It is a widely accepted fact that many fire risk assessors and enforcement officers (when assessing a building) are looking at things from the 'When a fire happens' perspective and make their decisions based upon this approach. An alternative, more realistic and cost-effective approach is to consider 'How likely is a fire to occur' and then consider what the effects could be. But this approach is only possible if the person is competent. According to the HSE (2018) *'Competence can be described as the combination of training, skills, experience and knowledge that a person has and their ability to apply them to perform a task safely. Other factors, such as attitude and physical ability, can also affect someone's competence.'* Experience is not quantified but, in this instance, it implies the person should have experience of fires in sheltered housing, or in the least, experience of sheltered housing.

The purpose of an FRA is to identify if the occupants of a building are safe. The assessor can only base this on what they can see, which is only the communal parts of a building, and their level of competence. Therefore, it could be said that the FRA is only likely to tell the reader if the occupants are safe from, or likely to be affected by, fire in the common parts, but not if they are likely to be affected by fire anywhere else due to factors that are not obvious to the naked eye.

The typical format of the FRA is a 5-step process.

Step 1 - Identify the fire hazards.

Step 2 - Identify people at risk.

Step 3 - Evaluate, remove or reduce the risks.

Step 4 - Record your findings, prepare an emergency plan and provide training.

Step 5 - Review and update the fire risk assessment regularly.

This research focuses on Steps 1 and 2.

Step 1 – Identify the fire hazards.

In most fire safety risk assessment guidance there is a list of fire hazards. This is not an exhaustive list but will usually include candles, mobility scooters, smoking paraphernalia, overloaded sockets and electrical equipment that appears to be damaged. But there may be less obvious fire hazards that are not there for the fire risk assessor to see. This is the potential that a ‘negative’ safety culture exists in the building and therefore means that what would be an instantly recognisable fire hazard is now a significant fire hazard. An example of this is residents that choose to smoke in undesignated areas of the building when the manager is not present i.e. near the gas intake or boiler room. Another example would be that of residents parking, and in some cases charging their mobility scooters in the communal areas of the building thereby not only placing a highly combustible piece of equipment on an escape route, but also potentially obstructing fire fighter access to an emergency.

Step 2 – Identify people at risk

In sheltered accommodation all persons within the building would be classed as people at risk. This includes the manager, all residents and their visitors, contractors, and any other visitors to the building.

In the past few years England has witnessed some tragic fires involving people in sheltered accommodation. Having worked for the London Fire Brigade as a FSIO the author has first-hand experience of how fire authorities have now put the onus on sheltered housing landlords to take a ‘*person centred*’ approach to fire safety when carrying out FRAs of their building stock.

Managers responsible for the day-to-day running of sheltered schemes are now expected to understand each vulnerable resident's needs in terms of fire safety protection and take the necessary action which includes ensuring that any significant information is made known to the fire risk assessor. An example of this is a resident who is on medical oxygen. This information may affect the decision making by the fire risk assessor when considering significant findings, which could result in action that would not be taken with other residents. An example of such action would be the provision of a separate charging area for a mobility scooter belonging to a resident who is on home oxygen therapy, so they do not need to charge it in their flat.

The definition of vulnerable as far as this new approach is concerned is generally someone with a habit such as heavy smoking or drinking, any physical disability that may delay or make evacuation difficult, or someone with a mental health issue that means they may not understand general health and fire safety thereby placing themselves and others in danger through their actions. In his article Coombe, N (2017:36) discussed the new 'Person-centred Approach' to fire safety. He states *'A typical example of a high-risk resident would be an individual who, for example, smokes, has the potential, due to their physical or mental capacity, to inadvertently set fire to their clothing, whether in bed or in their lounge, and, due to physical health and mobility issues, will be slow to evacuate without assistance.'* Whilst this does make sense, it could be argued that actual visible physical attributes are not the only thing that makes a person 'high-risk'. A non-typical 'high-risk' resident is potentially then at higher risk as their attributes are potentially unknown or not considered until an incident occurs. A point that lies at the heart of this research.

9. Methodology

Step 1 – Gather AIMS Data

AIMS is the Accident and Incident Monitoring System.

When an incident of any nature occurs anywhere in the scheme or in the schemes external grounds, that involves a resident, a member of staff, or anyone else, or any incident involving equipment, or an equipment failure such as a fire alarm fault, it should according to the company health and safety incident policy, be recorded on AIMS using a 5-step process.

- Step 1 is for managers to record their details so there is a full audit trail that details who was responsible for the scheme at the time the incident occurred.
- Step 2 -the manager records when and exactly where the incident occurred.
- Step 3 is the option for selecting the incident category. Options include Asbestos, Burns and scalds, Manual handling, and the category for which this research focusses, Fires, fire alarms, and explosions. The Fire option then has a further four options to choose from: Explosion, Exposure to Fire/Smoke, and Fire.
- Once the category and sub category has been chosen, a second page appears in which there are more drop-down menus that have specific details, for example, ‘Cause of fire’, ‘Item that first ignited’ and another drop down that offers possible ‘Methods of extinguishment’ such as ‘Dousing with Water’ and ‘Smothering’.
- Step 4 then asks for details of the person(s) involved.
- Step 5 is where the manager must enter all incident details including witness information and a full description of the incident.

The manager is expected to complete an entry on AIMS every time any incident activates the fire alarm system. The recorded information should always include:

- The location of the incident (communal area, or inside a resident's flat)
- The cause of the incident, specifically whether it was a human error or equipment failure
- Who was involved
- The exact details of the incident
- The action taken by the resident, the manager, and/or the emergency services.

For each of the schemes all data that related to a fire or smoke incident that occurred between 1st May 2015 and 1st May 2018 was collected and cleaned. According to Kumar (2014:296) the process of cleaning is by way of editing it to ensure that it is 'free from inconsistencies and incompleteness'.

Any entries that were categorized but had no further information to establish what the incident was have not been included. Any duplicates, or entries that have obvious errors such as recorded under the wrong category, were filtered out.

Any entries that that were not correctly reported or had all the necessary details filled in were not included. Neither were reports where the manager has stated that they were not aware of the incident first hand, such as reports from other residents about incidents alleged to have occurred when the manager was off site and there is no evidence from the ARC nor is there a print out on the fire panel itself.

Step 2 – Planning the research

In order to conduct this research, the initial task was to decide on a plan for collecting the necessary data. According to Kumar (2014:171) data can be categorised as either Primary data,

or Secondary data. Primary data is first hand, collected directly from a primary source and Secondary data is second hand data collected from documents either electronically or physically.

The three methods of collecting Primary data are:

- Observation
- Interviews
- Questionnaires

Observation would possibly provide the most accurate answer to the question however residents are not often in the communal areas of the schemes and so it may often be the case that there would be no one to observe.

Interviews would be too time consuming with such a large sample participating. This would have a negative impact on the organisation both in terms of the time managers would be busy being interviewed, and the author being away from their usual role.

Questionnaires would be the most practical method as they do not rely on the researcher and the respondent being available at the same time.

Kumar (2014:172) lists Secondary data as being information contained within;

- Government publications
- Earlier research
- Census
- Personal records
- Client histories
- Service records

Secondary data was not relevant to this stage of the research and so it was not requested or explored.

The first step of the research was to produce the research instrument. To do this, the author needed to ascertain what would be the most suitable questions. Considering the many issues of which the author has addressed with scheme managers over the past two years, an initial list of questions was put together. It was hoped that the answers to these questions would possibly identify any trends, or highlight any other issues that the author was not aware of, that would be significant enough to explore for the purpose of investigating the possible safety culture in a scheme. This questionnaire was the first research instrument and can be found in Appendix 3. The next step was the process of using the research instrument and deciding on the methodology for conducting interviews with a group of managers (who would not form a part of the sample population).

Step 3 – Select method for interviewing scheme managers

According to Kumar (2014:176) there are three different types of interviews and methods of conducting them.

Structured interviews are comprised of questions that can be repeated to all interviewees. The advantage in the case of this particular research is that structured interviews enable the researcher to compare all answers to the same questions, from all of the interviewees. According to Kumar (2014:178) a structured interview ‘*provides uniform information, which assures the comparability of data*’.

Unstructured interviews are fluid. The respondent is not limited to how they answer. This method will require the interviewer to have the particular skills necessary to build a rapport with

the respondent and understand the subject in order to steer the interview in the right direction.

Whilst this method may provide the researcher with a lot of valuable data, any discussion off topic is wasted time. The time available to conduct interviews is limited and must not be wasted.

Semi-structured interviews are a combination of these methods. Useful if some questions require direct answers, but also useful if there is little known about a topic that will require the respondent's added knowledge or views on the subject.

The two methods of conducting interviews are in person, or via an alternative medium such as the telephone or via the internet. They further emphasize the importance of choosing the correct method to match the researcher's skill set. To interview in person will allow the interviewer and respondent to meet which may enhance the outcome of the interview. Body language tells someone how that person is feeling, signs that may be important for the interviewer when asking the respondent questions. If multiple interviews are required, logistics may mean that in person interviews are either costly or due to travel [location], impractical.

Using the telephone or internet allows the researcher to interview respondents wherever either party may be. Distance is not an obstacle and this method may mean that more interviews can be carried out in a shorter space of time. The cost of phone calls may be less than the cost of travelling to and from places to carry out the interviews. One disadvantage to this method is the lack of personal contact which may hinder the development of any possible required rapport.

In order to collect the required data that was used to construct the research instrument, a semi-structured interview was decided upon for a few reasons:

- It allowed for the research to include answers to questions deliberately focussing on the possibility of a culture, both in the scheme and in the wider organisation.

- It meant that there was less of the manager's time taken up discussing safety issues as the conversation was steered in the right direction.
- It meant that the respondents were all answering the same questions which could possibly illustrate any trends that would be useful for inclusion on the final questionnaire.
- It allowed the interviewer to probe a bit deeper if the answers given to questions required a more detailed answer from the one given by the interviewee.

Sample population

As it was important that these interviews were open and honest, with managers potentially confirming that they do not always act in line with the employers' policies and procedures, it made sense for them to be conducted with specifically chosen managers that the author had a good rapport with to give them confidence that the promise of confidentiality would be honoured. For this stage, purposive sampling was the best option. Kumar (2014:374) refers to purposive sampling as '*Judgemental Sampling: The primary consideration in this sampling design is your judgement as to who can provide the best information to achieve the objectives of your study.*'. The only other attribute was that all managers must have been in the role for 3 years or more at the same scheme to ensure they knew their residents well and had been in post long enough to know all the organisation's health and fire safety rules and policies. In order to avoid any potential bias or potential errors in the research data, it was important that the selected managers would not then be a part of the questionnaire survey. This decision was taken as managers who have been interviewed could find themselves trying to answers on any future questionnaire with the same answer they gave in the interview.

Step 4 – Conducting and Coding the telephone interview results

An initial phone call was made to the manager that had agreed to be interviewed to confirm that the interview would take place at an agreed time. A further phone call was made five minutes prior to the actual interview commencing to confirm that the manager is ready and still prepared to be interviewed. All the conditions were explained. The call was made and recorded on the author's personal mobile ensuring that the employer had no access to the conversation. It was explained that when the interview call was made, the manager was not to state, nor would they at any time be asked to confirm, their name, their location, or any specific details about their scheme. Once the call was concluded, the author played back the recording and simultaneously typed the respondent's answers to the questions. As soon as an interview was transcribed, the recorded sound file was erased from the phone's memory. Appendix 3 contains the full list of interview questions.

The transcription was then coded. Significant statements were highlighted and all common themes that were mentioned by at least three managers was copied onto a separate document. This list of statements or answers was then converted into questions. For example, Question 12 was '*Items in corridors and stairwells, any issues?*'. All managers replied that in the main people do follow the scheme rules, but when one resident ignores the rules and stores something such as their mobility scooter in the corridor or puts plastic plant pots and flowers on the shelves, other residents think the policy has changed and they then begin to do the same. This was then turned into Questions 13 and 14.

Q13 Is it OK to keep personal items in the corridors?

Q14 If your neighbours put pictures up on the walls in the communal areas, would you too?

Step 5 – Constructing the main research questionnaire

Data Collection

Using the information collected during the initial interviews two different questionnaires were constructed loosely following the Conforti & Peiffer (2015) HSE inspectors' tool for measuring safety culture which splits the topic of a safety culture into seven separate headings each with a list of questions. The responses to these questions are recorded, along with an inspector's comments, and finally a section to record any required improvements. This tool is suited for the inspection of a commercial environment and so was scaled back in order to make it more suitable for a domestic environment. With no researcher being present to record respondents' answers, this research required an alternative method for respondents to answer each question and so the methodology for measuring the responses had to be decided. According to Kumar (2014:204) the Likert scale '*is based upon the assumption that each statement/item on the scale has equal attitudinal value, importance or weight in terms of reflecting an attitude towards the issue in question.*'. As the questions being asked would reflect an opinion and not a fact, it was deemed to be an instrument of attitudinal questions, for which the Likert scale was appropriate.

Resident questionnaires

The aim of the resident's questionnaire was to identify what their perception was of the various topics. Business decisions regarding health and safety are not always understood by residents due to the fact they cannot be involved in the actual process. The questionnaire would hopefully identify what impact this has on their feelings towards the manager and their landlord overall.

The questionnaire had questions that fell into the following categories:

Motivation – What factors may encourage individuals to embrace a culture?

In the workplace, employees have a responsibility under the Health and Safety at Work etc Act 1974 to comply with their employer's health and safety rules and can be disciplined or sacked if they deliberately choose not to comply. In a domestic setting, there is no such legislation for residents, only their tenancy agreement. This group of questions explores why residents would choose to comply with the rules when there is little or no recourse if they do not.

Question 1 asks '*What's the most important factor of independent living? Community, Convenience, Safety or Other*'. As discussed earlier, if convenience is the main reason a resident chooses to live in sheltered accommodation it indicates they are not living in it for the purpose it was intended therefore reducing the likelihood they will engage in any possible culture.

Question 2 – '*Would you say you are proud to live in your scheme? Yes, No, Maybe or Other*'.

Again, this has to do with the feeling the resident has of their landlord. If this question has an overwhelmingly positive response then it might be realistic to assume that the same residents will have a positive attitude towards schemes rules and regulations. Question 3 asks residents '*Do you feel your scheme is a safe place to live?*' If residents do not feel safe in their own homes are they likely to participate in a culture or are they more likely to feel isolated? And furthermore, do their other answers indicate possible reasons for them feeling the way they do? Alternatively, do their other answers indicate that they are a part of the reason that they do not feel safe?

Questions 4 and 5 concern accident reporting and the resident's faith in the managers response. Residents know that managers need to be made aware of all incidents so that they can investigate if necessary. But if the residents do not comply because they either choose not to, or because they do not feel there is any point, this could indicate a lack of willingness to be a part of a culture.

Communication – Are decisions communicated and are managers equipped to communicate health and safety information effectively? Is health and safety discussed amongst residents?

This section of questions assesses the flow of communication both from management to residents and amongst the residents themselves. A potential feature of a positive successful safety culture in a domestic environment is a willingness of those within it to be a part of it for the very fact that they do not have to, if they do not want to. Question 9 asks residents '*Do you ever discuss safety matters with your neighbours?*' This is a significant question as it may indicate that there is a shared value amongst residents, that they freely discuss amongst themselves just as they would any other topic of conversation. A high score on this question would indicate that health and safety is potentially governed by the residents themselves and not necessarily by the scheme manager. For a culture to exist and thrive in commercial environments the management needs to implement the rules and ensure that subordinates adhere to them. Questions 6,7,8,10 and 11 ask the resident about the communication between them and the manager to establish if the rules have been communicated, explained, and understood.

Compliance – Is compliance voluntary and understood? If residents do not comply then there can still be a safety culture, but it might be a negative culture as opposed to the typical positive safety culture. Questions 12,13,14 and 17 ask the resident if they comply with the rules that they would have signed up to when they moved into the scheme. This is an important set of questions due to the different environment. In sheltered accommodation the manager is only present during regular working hours. It is unlikely that the rules imposed on residents would be ignored when they are absent as there would be significant repercussions on the manager's return. If a resident is of the mind to break the scheme rules they will hopefully be honest in their answers on the questionnaire.

Involvement – Do individuals feel they are a part of the decision-making process when it comes to rules and regulations? A safety culture relies on its members feeling valued. Question 15 asks the resident *‘If the manager introduced new rules, would they explain or discuss them with you first?’* and Question 16 asks *‘Are you ever given the time to share your views regarding the scheme rules?’* If residents feel they are being told how to live in their own home, they will feel they are being dictated to. This may result in a safe place to live, but it does not indicate a safety culture.

Management – What part does management play in the building of a safety culture? In the case of sheltered accommodation, residents should choose to live in a scheme because they have the benefit of a scheme manager. This section asks residents if they believe the manager is helping to keep them safe in their homes?

A copy of the residents’ questionnaire can be found in Appendix 4.

Managers questionnaires

Whether any culture exists will depend on the incident data and the data from the resident respondents. If they answer as a collective or any trends are identified when analysing their responses then it can be said a culture of one sort or another may exist which could be interpreted as meaning the managers responses are irrelevant to the question. But what the questionnaires may highlight is a difference of opinion between managers and residents, which is often the case, due to either a lack of understanding, a lack of communication, or in some cases a personality clash between the two parties. This in itself would be a significant finding as in these cases it may highlight why a safety culture is impossible to implement or maintain under certain conditions, a fact that is understood in commercial environments and requires change when those conditions exist.

It was important that the managers' questionnaires allow them to detail what they do in terms of health and safety without the potential for highlighting if they did not do what the business expects of them. This would present ethical issues as such information could indicate residents are not getting the service they are paying for, and equally if managers felt they were being asked questions on their performance they may feel that their honesty could result in some form of disciplinary action and so alter their answers to protect their jobs. To avoid this, the questionnaires are constructed in a way that it is assumed managers do what they should do, and instead provided the opportunity to state if they exceed the organisations expectations. Many scheme managers do not record the incidents that they should have been recording.

Sample population

As the research concerned every scheme in the portfolio, it would be impractical to conduct the research across the whole organisation and so cross-sectional sampling was chosen as the most suitable to carry out the research. To achieve this, area managers, each responsible for managing large areas of the country, were asked to select one scheme from each county using the following criteria.

The schemes:

- Must have been built more than ten years ago (for the purpose of establishing a long-standing culture)
- Must have two floors or more (so the building has stairs, often a fire safety concern with regards to residents storing and leaving items in the protected stairwells)
- Contains typical rented accommodation only, no leasehold, no extra care

- Has no residents, or a very low number of residents with known capacity issues (to avoid the ethical issues surrounding capacity)

The scheme manager:

- Must be in a permanent role
- Must have managed that same scheme for over two years
- Should know all the residents well enough to ensure that any with mental capacity issues will not be asked to complete a research questionnaire. It must be noted, however, that managers are not qualified or legally allowed to state that a resident has mental health issues. To this end, there are possibly situations where residents with mental health issues partake in this research. This cannot be avoided.

Of the 44 counties in England, only 40 had schemes that fit the above criteria. As one scheme from each county was selected, this resulted in a potential sample of 400 residents and 40 managers.

Step 6 – Sending and receiving the questionnaires

There are restrictions regarding how to get questionnaires to schemes. The residents live in individual flats and the scheme manager would need to oversee the process of returning them on time. Electronic methods are not an option as there is no guarantee that residents have the equipment necessary to participate. With a sample group of possible 440, a telephone survey would have been too time consuming and too difficult to organise. The only suitable method remaining was a postal survey. Although relatively low cost, the downside of this method is the potentially low response rate but with a planned sample of 440 even a 50% response would provide enough data for the research question.

A survey pack consisting of a manager's questionnaire and ten resident questionnaires was posted to each of the participating schemes addressed to 'The Manager'. Each questionnaire had its own consent form and return envelope. The pack also contained a main return envelope. The scheme's unique identification number was then written on the inside of this envelope. This identification number was assigned by the author and was not related to any identification given by the business ensuring that only the author would know the envelope's scheme of origin. All questionnaires were then posted together to head office who in turn forwarded them to the author. If any envelopes were accidentally opened before being forwarded on to the author, it would not be possible to identify which scheme had returned it. Once an envelope was returned and received by the author, the information was processed and cleaned.

A copy of the managers' questionnaire can be found in Appendix 5

Step 7 - Data cleaning

Any scheme that returned less than five questionnaires would be deemed void as this would not be a fair proportion of a scheme population. All questionnaires were cleaned for errors. As the respondents were anonymous there was no way to determine what a respondent actually meant if they had made a mistake on their questionnaire. If respondents did not fill in the questionnaire correctly (e.g. missed multiple questions), their questionnaire was voided and not included in the research. Any that were only completed on one side were not included in the research. Any that were illegible were also not included.

Step 8 - Coding the questionnaire

Q1	Whats the most important factor of independent living?						
	Community	Convenience	Safety		Q1	1	0
Q2	Would you tell others you are 'proud' to live in an Anchor building?						
	Yes	No	Don't know		Q2	1	0
Q3	Do you feel your scheme is a safe place to live						
	Yes	No	Don't know		Q3	1	0

Figure 2: Coding the returned questionnaire

The questionnaires were coded in two stages. The first focussed on the initial question. A positive response to a question was equal to one point, a neutral equal to 0.5 and negative a 0. Any questions that were answered with two answers, only received 0.5 as a score. This is due to the fact that the answer may have been deliberately marked in this way and is then open to interpretation. Any questions not answered do not receive any score because if blank questions were scored a '0' it would act as a negative score and therefore affect the percentages.

If respondents gave all positive answers on the resident's questionnaire then their total individual score would be 21 points (1 point for each of the 21 questions) and on the manager's questionnaire 22 points (also one point for each of their 22 questions). The questionnaires allowed the respondent to answer with a comment. These answers were coded in the same way fixed answers were. Any comments that were of a negative tone received and could potentially contribute to a negative safety culture scored 0 points. Answers that were potentially unsafe but well intended therefore illustrate a positive attitude towards safety received 0.5 points. Other comments that were both positive in nature, and an appropriate answer for the question received one point.

It is a possibility that some questions will not be answered, and that some comments have no relevance towards the question being asked. This does not necessarily mean there is a negative or positive response should the respondent have answered correctly so the question in these instances will not be scored at all as a score of 0 points will affect the percentages.

Choice of methodology

This research required comparable information so the author can ascertain if the statistics available reflect the feelings and behaviour of the sample population.

Quantitative research allowed the author to compare the statistics collated by the insurance companies and the fire authorities with the statistics from one particular organisation. It also enabled the author to illustrate how fire safety has changed over the years in terms of fire-related incidents. To use this method alone would have meant that there are no personal feelings behind the data to discuss. Fire safety statistics are mostly figures based on reports. They do not ask the question ‘*Why?*’ or ‘*How did these figures come to exist?*’

Qualitative research allowed the author to examine how people feel about health and safety in general. It allowed the author to compare the opinions of the managers in sheltered schemes with a view to correctly extracting data from the residents. It also allowed the author to ask questions of the manager that are not often considered when discussing fire safety. The main difficulty with asking people about health and safety is they will tend to respond with an answer that will be seen as possibly the right answer, as opposed to the real answer, which the author knows, through experience, is not always the truth.

According to Kumar (2014:132) ‘*Quantitative study designs are specific, well structured, have been tested for their validity and reliability, and can be explicitly defined and recognised. Study designs in qualitative research either do not have these attributes or have them to a lesser degree. They are less specific and precise, and do not have the same structural depth.*’

For balance, *Mixed methods* was the appropriate methodology for this research as the statistics, whilst being useful, do not allow the reader to make informed decisions as to the ‘why’ fires

occur in sheltered housing whereas the qualitative data may provide the reader with an insight into the root cause.

10. Results and discussions

The incident data

The first stage of the research involved gathering the data regarding fire-related incidents for all of the schemes selected. The first statistic collected was the total number of smoke or fire-related incidents which included all fire alarm activations. Due to the way in which managers classify the actual incident and the many variables regarding the cause, the data was then organised into three separate headings.

1. Resident cooking
2. Resident - Other
3. Other

The recording system does not contain drop downs for managers to select root causes so any incident related to cooking was grouped under heading one 'Resident cooking'. This research does consider that cooking itself can cause alarm activations due to the style of cooking, the design of the flat, the ability of the cook and other physical attributes of the occupant of that flat.

Aside from cooking, incidents can be as a result of smoking, candles, incense, electrical issues and many more so these were grouped under 'Residents – Other'.

All other incidents which could range from contractors' actions, residents using air fresheners being used in communal areas in close proximity of the smoke detectors and managers not carrying out the regular call point test correctly are all grouped under 'Other'.

Scheme No	Number of fire-related incidents	Residents cooking	Residents other	Other
2	2	1		1
6	0			
7	11	10	1	
8	29	24	2	3
9	19	17	1	1
10	0			
12	9	6	3	
13	10	10		
14	1		1	
15	49	36	8	5
16	7	6	1	
17	43	41	2	
19	12	9		3
20	1		1	
21	37	35	1	1
22	1		1	
23	4	3		1
24	27	21	6	
25	8	8		
26	17	10	4	3
30	27	25		2
33	23	19	3	1
34	5	4	1	
36	11	10		1
37	14	14		
38	0			
39	1	1		
40	0			

Table 1: Scheme fire-related incidents 1/5/15 - 1/5/18

When the majority of schemes' envelopes had been received all those unaccounted for were contacted. Various reasons were given for nil returns including an unwillingness of residents in some schemes to participate.

Return packs with less than five resident respondent questionnaires were discounted as this would not be a fair representation of a possible culture in a building with at least 30 occupants. three schemes returned less than five resident questionnaires. This resulted in a total of 28 of the

40 schemes participating in the research. The total number of respondents therefore was 28 scheme managers, and 249 residents. This in itself could be viewed as important data. If only 70% of the schemes were able or willing to participate in a health and safety survey, it could be said that there are already signs of a negative culture among those who had nil, or poor, returns. Schemes with a high number of responses could have either a positive or negative culture, depending on the motivation or willingness to participate.

The data shows a vast difference in the number of recorded incidents from one scheme to another. The highest number of incidents was 49 whereas four schemes recorded 0.

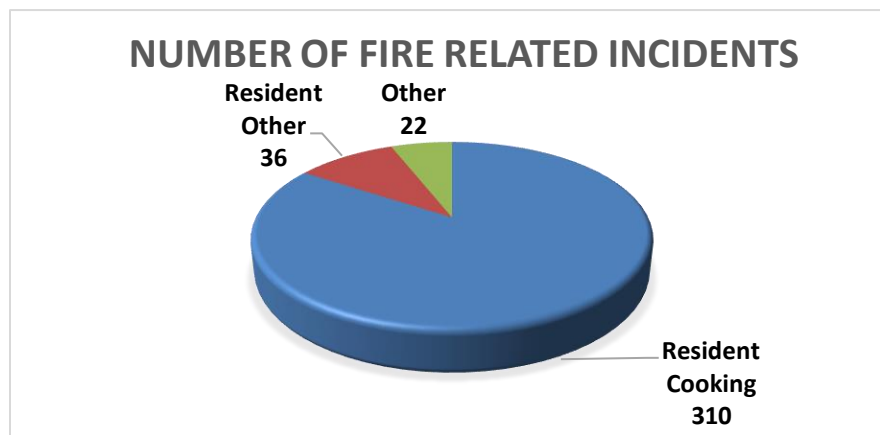


Figure 3: Number of fire-related incidents over the 3-year period.

This gap in the numbers recorded is for a number of reasons. It could be that in some schemes the managers record all fire-related incidents and in others, they do not. Or it could be that some schemes simply do not have many or any incidents to record. 368 incidents were recorded. 310 (84%) of all incidents were attributed in some way to the resident cooking. This could be for a number of reasons including:

- the resident's physical ability
- the design of their flat

- the type of food the resident cooks
- the resident either forgot they were cooking or were distracted.

The author has first-hand knowledge from working alongside scheme managers of the many reasons cooking can be the cause of fire alarm activations and other fire-related incidents. Age could be a factor due to the fact that people can become more forgetful or more easily distracted as they get older. Equally, the style of cooking itself is another cause. Some people deliberately burn food which can in turn give off enough smoke to activate the fire alarm system. And there are some cases whereby the flats itself is the issue. Examples of the flat being the cause include the fact that some have very low ceilings and therefore smoke detectors are activated very easily by all cooking. The layout may be such that the kitchen is on the inside therefore all cooking fumes are drawn to the external windows which means they first pass through the lounge, setting off the detectors.

Whilst these are possible unwanted fire activations, they are still fire or smoke related incidents that take up resources and therefore efforts should be made by both the scheme manager and the residents to reduce them.

A total of 36 incidents (10%) of all recorded incidents were as a result of resident's actions but not related to cooking. Other incidents included residents or visitors using E-cigs and spraying aerosols too close to detector heads, both of which cause the heads to activate the fire alarm. On some occasions residents decided to test the smoke detector inside their flats and forgetting theirs is part of a building-wide system. This is not something they are supposed to do as there are contractors who attend the sites for the purpose of testing all parts of the fire alarm system. These incidents usually occur due to a lack of awareness or understanding as to how the fire alarm works. In a commercial environment all employees are expected to know how the fire

alarm works if their actions could have an impact on it. But this is not the case in a domestic setting. Residents are instructed in what to do if the alarm sounds but not trained in how the system operates.

The 'Other' category only attributes for 22 incidents, which is only 6% of all incidents. Most were one-offs that could not be prevented, such as contractors failing to deactivate the fire alarm panel prior to servicing it. As they were not caused by the manager or the resident, it is not considered to have any effect on the question of culture so the data was not examined further.

The statistics do however highlight a significant finding. It could be possible that the lack of data in itself from some schemes is due to a lack of reporting for whatever reason, and not an indication that there was a low number of fire-related incidents. This is seen as a critical element of a safety culture. If this is the case, there are again different reasons managers may not report including;

- they are not clear on what to report
- they have not been shown how to use the recording system
- they do not find the time to report
- they choose not to report

Whatever the reason it would be something a safety culture tool would see as a deficiency whether in the manager's training, competence, or behaviour.

Does a culture exist in sheltered accommodation?

If this research proves that a positive safety culture can exist in a sheltered scheme, it should be reasonable to conclude that it would be a very safe building. The manager would have a full understanding of the scheme rules and be aware of any difficulties the residents had with complying. If this was the case, the manager would address this issue and do what they needed to do to ensure all residents acted in a safe manner and did not put other residents at risk. Being a safety culture, other residents would also help those with difficulties complying. In a sheltered scheme, non-compliance is not necessarily deliberate. There are cases where residents simply cannot comply. Mobility aids such as scooters and walking frames must not be left in corridors as they are a potential obstruction for anybody needing to escape their flat or the building, or emergency services needing to enter the building in an emergency. And scooters themselves are known to catch fire due to their battery malfunctioning, but some residents cannot physically get their aids into their flats and so leave them in the corridor. In a safety conscious scheme, adaptations would be made, or solutions found for this problem.

Regular meetings between residents and the manager would be held to discuss safety matters and all residents would be engaged in the process of amending rules or introducing new ones. This however all takes time. It needs to be remembered that scheme managers have a varied role with a lot of responsibilities and are **not** the top of the organisational tree which means they are limited in what information they can, or are able to, share with residents. They also only have a set number of hours in the day to carry out all their duties and as in all professions, some managers will be more proficient, and better organised than others. Equally, some residents will be more open to this type of environment than others. But the very existence of this utopia has not, to the authors knowledge, been researched before. As the ethos of a safety culture is not one that is specifically promoted in social housing, coupled with the lack of training given to

management in how to create and manage one, it is wrong to assume that any phenomenon that does exist is as a result of a safety culture when in fact it could be an entirely different reason altogether. Therefore, the logical order of questions for this research to investigate is firstly, 'Does a culture exist?' and secondly, 'If one does, is it a safety culture?'

The first step of the research was to interview the chosen managers. The managers were all asked the same set of questions and in the main gave the same answers for all of them. There were common themes throughout the answers which were used to form the final resident's questionnaire. All the managers said that the majority of their residents complied with all of the scheme rules which is very positive but interestingly all managers raised the same issues of non-compliance. These issues included the evacuation policy, rules regarding escape routes, and other issues that would be cause for concern in a fire situation. The managers all had difficulty explaining the difference between an accident, an incident, and a near miss. They also struggled to explain in detail why they have the evacuation policy that they do. It is important to know **what** evacuation policy you have in a building that you manage, but it is equally important to understand **why**. As all the answers were very similar or the same for each manager, it is either a coincidence that the residents of different buildings behave in the same way, or alternatively it suggests that there is possibly a culture of sorts.

It is reasonable to expect that any scheme that has clear differences from others does so because of the characteristics of the people living and working in that particular building. Those characteristics may be different age groups, physical abilities, different opinions and different lifestyles. These are elements of a culture that can be found in any place where people live together.

The next step was to analyse the data from individual schemes to discover if any form of 'culture' exists and then assess if it is a 'safety culture'. On each questionnaire the overall scores have been converted into percentages of the possible highest score. The manager's questionnaire has a maximum score of 22 and each individual resident has a maximum score of 21. The overall score of a scheme is the percentage of the maximum score possible i.e. a scheme with ten resident respondents has a potential score of 210. The scheme score is the percentage of that possible score.

The most obvious sign that a safety culture exists would be if the number of health and safety related incidents that occurred in a scheme was very low. However, day-to-day activities vary from scheme to scheme and so it would be impossible to set a benchmark by which all schemes should be measured and so further research may be required to establish if this is this a suitable method.

Another indicator will be to compare the answers given by the respondents in a scheme. In theory the existence of a culture could be proven to exist if managers and their residents respond in the same way to the same types of question. If a manager is implementing the scheme health and safety rules with the support and cooperation of the residents then there should be an understanding of those rules by all those that they affect. In the telephone interviews, all the managers stated that their residents know the scheme rules and in the main abide by them. None said that there was resistance to new rules and none said that as a result of the scheme rules residents were unhappy. Therefore, it is reasonable to expect that all the managers' scores will be similar to, or reflect, the residents scores. To confirm this the case, the scores for each scheme were compared. The schemes were placed in order with the highest scoring scheme at the top of the scale.



Figure 4: Overall scheme scores

Figure 4 highlights a pattern. The scheme with the highest residents scores also has the highest manager score. The scheme with the lowest residents scores also has the lowest manager score. Although there are peaks and troughs in between there does appear to be a relationship between the two scores on most of the 28 schemes. This data suggests that the manager either influences the culture, or they share the same opinions or feelings regarding health and safety. This does then suggest the possibility of a culture but requires a more detailed examination of the respondent's data. This is a significant finding in respect of the original question of '*Can the number of fire-related incidents in sheltered accommodation be attributed to the existence of a safety culture?*'. The critical analysis will hopefully indicate that the culture is a safety culture. As previously discussed, the culture in a domestic environment can only exist if the residents are

willing. To examine this in more detail, the questions under the ‘Compliance’ heading will be significant. Questions 12,13,14 and 17 all ask residents about their actions regarding certain rules that they have already agreed to abide by when they signed a tenancy agreement upon moving into their particular scheme. If all respondents from a scheme stated on their questionnaire that they will still comply, their overall score will be 100%. If the scores are lower than 100% then respondents are making a deliberate decision not to comply with the scheme rules, despite the fact they have all signed a tenancy agreement stating that they will. It should be the case that schemes with a low number of fire-related incidents have a perfect or near perfect compliance score, and those schemes with a high number of incidents have a low compliance score.

Scheme with the highest resident score

Scheme 22 Data	
Managers Score	98%
Residents Score	97%
Number of Fire-related Incidents	1
Compliance Score	100%

Figure 5: Scheme 22 data

Scheme 22 lost most of their possible marks for 2 questions. Residents scored 71% for Questions 8 and 9 but scored 100% for all the others. Interestingly, of the seven in the schemes sample, both lost scores came from the same two respondents. Question 8 asks residents ‘*Does the manager explain to you what safety checks they must carry out?*’ for which they both answered ‘No’.

This scheme also had only one recorded fire-related incident in the selected period. The manager of this scheme also scored highly with 97.7%. This manager lost half a mark on Question 16 of the managers' questionnaire by answering *'Those affected'* when asked *'Do you discuss scheme related incidents with residents?'* With a compliance score of 100%, the sample population for this scheme gave no negative answers for any questions that relate to their actions. This indicates that there is a very positive attitude towards health and safety in this scheme. With only one fire-related incident, it is reasonable to conclude that there is a 'positive safety culture' in this scheme but further research would be required to confirm this.

Scheme with the second highest resident score

Scheme 7 Data	
Managers Score	82%
Residents Score	97%
Number of Fire-related Incidents	11
Compliance Score	93%

Figure 6: Scheme 7 data

The second highest scoring scheme, scheme 7, tells a similar story. All resident responses were between 80% and 100% positive. The manager was not of the same positive opinion as the residents in their scheme and lost marks for a number of questions and did overall appear to respond with more uncertainty than one would expect indicating that the manager was possibly not as confident about themselves as they perhaps should be. With a score of only 81% the manager lost marks for what appear to be a gentle approach to health and safety scheme rules. Though the manager answered *'No'* to Q18 *'Do you regularly remind residents of the fire*

evacuation procedure?’ all respondents of that scheme responded otherwise. But interestingly, 20% of respondents for this scheme did state that during the last fire alarm activation they left their flats, even though the building will have a ‘Stay put’ policy. (The term ‘Stay put’, also known as ‘delayed evacuation’ is currently the subject of debate in the aftermath of recent fire tragedies. The author is for this reason, deliberately not going to explore the rights and wrongs of this policy in this thesis.)

For Q21 *‘Does your office reflect your high standards of health and fire safety?’* the manager answered *‘Don’t know’*. This also indicates the lack of confidence the manager has in their own standards, or possibly is in indication of disinterest in the survey itself. Although this scheme only lost 7% in the compliance category, negative marks did come from four of the ten respondents. Overall the data indicates that residents do not always comply with the scheme rules. Whilst this is one aspect of a ‘negative safety culture’, it does not confirm that the phenomenon exists in this particular scheme. Furthermore, ten of the 11 fire-related incidents were cooking related so there is no evidence to confirm or deny that the number of incidents is as a direct result of the non-compliance issue.

Scheme with the lowest resident score

Scheme 10 was the scheme with the lowest score and had only a 70% positive response rate to the questionnaire and the manager also had the lowest score of all schemes in the sample.

Scheme 10 Data	
Managers Score	73%
Residents Score	70%
Number of Fire-related Incidents	0
Compliance Score	88%

Figure 7: Scheme 10 data

The most significant data for this scheme is found in the motivation group of questions. Question 2 asks residents ‘*Would you tell others you are 'proud' to live in your scheme?*’. Only one respondent stated they were, six respondents answered ‘*Don’t know*’ and the remaining three answered ‘*No*’. The manager also stated they would not say they are proud to work for the landlord. The author has visited over 100 schemes in the organisation and knows first-hand that this is a rare phenomenon and in itself is a significant finding. However, the manager and 100% of the residents stated that they feel the building is a safe place to live. 40% of residents said ‘*Convenience*’ is the most important factor of independent living. As previously discussed this indicates that a large proportion of the sample group then possibly do not live in sheltered accommodation for the right reason so this may have a knock-on effect in respect of how willing they are to engage in the ethos of living in sheltered accommodation. If motivation is lacking, the next category Communication has even worse scores and a similar pattern emerges. Question 6 asks the manager ‘*Are you confident that you understand the reason behind all the organisations*

policies and safety rules?'. This manager answered 'Some'. Similarly, Question 6 on the residents' questionnaire asks *'Have all the scheme health and safety rules all been explained to you?'*. This scored only 50% which makes sense when it is a fact that the manager does not understand all the rules, how can they be expected to explain them to residents. Similarly, the residents scored only 65% for Question 15 which asks them *'If the manager introduced new rules, would they explain or discuss them with you first?'*. Whilst the explanation is feasible, it is totally unacceptable when assessing the health and safety standards of any occupied building if it is discovered that the person in charge of the building does not understand the rules they are meant to enforce. In stark contrast to these responses are the responses to Management questions. Question 18 asks residents *'Do you feel the manager sees your safety as their priority?'* which received a 95% positive response. Q21 asks residents *'Do you feel the manager does enough to keep the scheme safe from accidents and fire'*. This received an 85% positive response. Whilst most residents believe the manager does what they are expected to in terms of health and safety, the feeling is not mutual. The manager answered 'No' for Question 16 *'Would you say all residents are responsive to scheme rules?'*. The residents however scored themselves 88% on compliance questions with only one respondent answering with a negative answer to only one question, but it lost marks from six of the ten respondents who gave answers that received only half of a point. This scheme appears to have a wide difference of opinion between all respondents. They feel that they are not communicated to enough by the manager, but at the same time the manager does a good job of keeping them, and the building, safe. The manager stated they are not proud to work in the scheme, do not understand all the rules, and do not communicate health and safety rules/changes as the role dictates. Residents believe they are compliant, the manager disagrees. This scheme illustrates the difficulty when considering the

possibility of a culture. On the one hand, the residents do not appear to share the same opinion on most of the questions asked. But they do in the main state total compliance with scheme rules even if they do not always understand them. They have faith in the management and believe they live in a safe building. The manager however does not demonstrate any leadership in their answers, nor do they appear enthusiastic in respect of their health and safety responsibilities. Clearly in scheme 10 there is a problem with communication as far as the resident respondents are concerned.

A culture may exist in this scheme (especially when considering that this scheme had residents scoring more half marks than any other scheme) but not one that is easily defined. The residents may have amongst themselves a positive safety culture in terms of attitude, but not in terms of their individual actions. All of the respondents returned low scores on their questionnaires. It is reasonable then to assume that all residents in the sample feel that health and safety needs to be improved upon in the scheme. Any potentially positive culture is possibly being compromised by a negative or non-engaging manager. As the manager is the person responsible for the building and the resident's safety, this could also be seen as a 'negative' safety culture.

Scheme with the highest number of fire-related incidents

Scheme 15 Data	
Managers Score	86%
Residents Score	89%
Number of Fire-related Incidents	49
Compliance Score	90%

Figure 8: Scheme 15 data

With a greater number of incidents than any other scheme, it could be assumed that the residents and the manager will return a higher than average number of negative responses. With a high number of incidents, the respondent's responses could also indicate a lack of understanding of the scheme rules regarding health and fire safety, or an unwillingness to comply. Scheme No.15 had the highest number of incidents with 49 recorded. Of those, 36 were resident cooking related, eight were resident other and 5 were other (non-resident related). The data confirms that the main cause of all incidents is cooking related so it is possible that individual responses to questions do not explain why the number of incidents is as high as it is.

With 49 fire-related incidents Scheme 15 should in theory be the scheme with the least positive resident responses. The overall respondent scores mean that scheme 15 with a score of 89% positive answering to questions is in fact the highest scorer in the bottom 50%. This scheme lost a significant amount of points from two respondents. One of which lost nearly all marks in Compliance category, and the other lost nearly all of theirs in the Communication category. These two individual respondents had a major impact on the schemes overall score.

With only two of the respondents from scheme 15 answering ‘*Convenience*’ to Question 1 ‘*What is the most important factor of independent living*’, the overall response was positive in regards to questions that explore motivation. The manager answered 100% positive to all questions in the same category. This then should indicate that all parties are happy living or working in that scheme, which in theory means the potential for a positive safety culture exists.

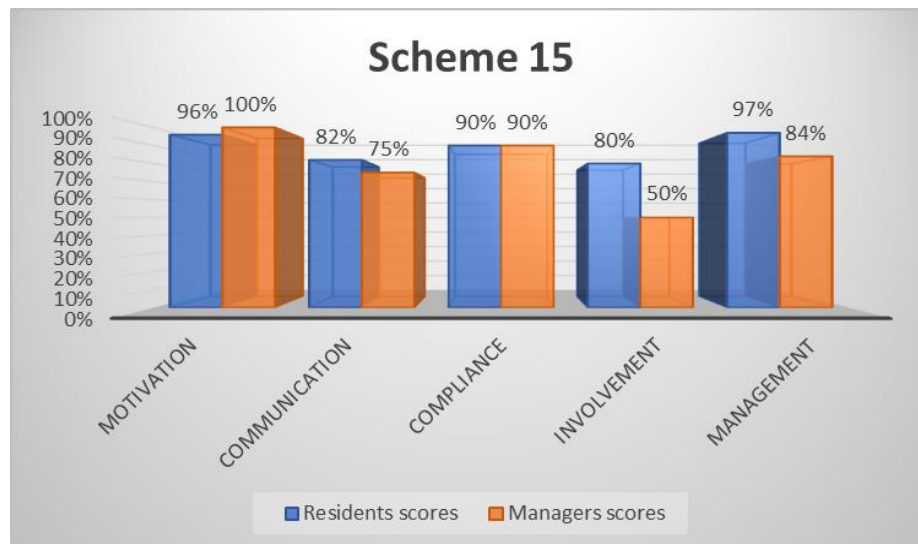


Figure 9: Scheme 15 scores

Whilst the residents’ scores were high, it is interesting to note that the two topics that score the lowest were the same two lowest topics for managers, Communication and Involvement. The residents only scored their scheme 82% for communication, whilst the manager only scored themselves 75%.

Residents did lose a high percentage of that category on Question 9 which asks respondents ‘*Do you ever discuss safety matters with your neighbours?*’. ‘Yes’ scores a mark, ‘*Don’t know*’ half a mark, ‘No’ scores 0. Only 44% of respondents answered ‘Yes’. Looking at this from a commercial viewpoint, if employees never discussed safety amongst themselves it could be a cause for concern as it may be an indication that complacency has set in. But in a domestic

environment, it could be argued that as residents are not responsible legally for health and safety, that they do not feel the need to discuss it.

The manager scored 90% placing them also at the top of the bottom 50% of all managers.

Interestingly, the manager of scheme 15 did not give a single 'No' answer, only losing half marks for the '*Sometimes*' answers. three of those '*Sometimes*' answers were in the same category, Communication. Question 8 asks managers '*Do you explain to the residents what safety checks you carry out and why?*'. Answering '*Sometimes*' to this question is partially positive but it could be improved upon. The author has first-hand knowledge from spending time in sheltered schemes that residents are more aware of health and safety and accepting of rules and regulations if they are regularly reminded what the managers are looking for when they are carrying out their checks. Residents do understand that the checks are to keep them safe in their home. In a commercial environment when managers carry out safety inspections, employees should be made aware of the activity as this is a clear sign that they are monitoring the safety standards. Any observations should be fed back during or after the inspection so all colleagues are aware of what needs to be improved, or what is being done well. In a housing environment it could be argued that this particular strand of 2-way communication is more important as residents have in the main left the workplace for good and may not be aware that risks still exist in their living environment. To carry out the checks and not engage with the residents at the same time is often seen by residents as the manager acting in a dictatorial manner. Question 10 asks the manager '*Do you discuss new rules with residents before you implement them?*'. The manager lost half a point for answering '*Sometimes*'. The author has experience first-hand that discussing new rules with residents makes them feel a part of the process, and makes them more appreciative of the need to have health and safety rules. Lastly in the Communication section

was Question 18 which asks managers *‘Do you regularly remind residents of the fire evacuation procedures?’*. Answering *‘Sometimes’* is not failing residents, but considering as we age our memories may begin to fail, it is sensible to regularly remind people of life safety information. Statistics in health and safety illustrate that the number of near misses and actual events are linked. The phrase *‘Near miss’* is possibly the reason so many managers in all fields do not treat them with the same level of importance as an actual event. Housing is no exception. Whilst the common phrase is *‘near miss’* it is used to describe the situation whereby an incident was averted for whatever reason, so the term *‘Near miss’* actually means, *‘Nearly happened’*. A simple example would be someone walking whilst looking at their mobile phone, looking up just in time to narrowly avoid walking straight into a lamppost. Question 13 asks the manager *‘Do you investigate near misses as you would actual incidents?’* to which the manager replied *‘Sometimes’*. Further research would be required, but it may be possible that the high number of fire-related incidents that have been recorded in this scheme are due to the lack of priority given to near misses. Whilst managers health and safety training does not include root cause analysis of incidents, and in housing the scenario may not warrant such depth of investigation, there is no way to identify trends or emerging patterns if the cause of a near miss is not examined, understood, and additional measures for ongoing prevention applied. Considering that the population comprises of older age groups and includes society’s most vulnerable, this could be seen as a missed opportunity.

Question 15 is very important in terms of incident reduction. It asks managers *‘Do you discuss recent scheme related incidents with customers?’* And then crucially gives the options *‘No’*, *‘With all’*, *‘Those affected’* and *‘Other’*. If the manager answers *‘No’* or only discusses the incidents with *‘Those affected’*, this may indicate a lack of understanding on their part as to the

importance of sharing information, or promoting safety. This could be a contributory factor to the high number of fire-related incidents worthy of further research.

In this scheme the manager answered '*Those affected*'. Whilst it is not a requirement of the role for managers to discuss all incidents '*With all*' residents it would demonstrate that the manager has a good understanding of safety and understands the importance of sharing information. This would be seen as best practice, akin to a toolbox talk in a commercial environment where management or supervision will deliver a safety briefing to a specific group of individuals, focussing on a specific element of safety, for example a foreman on a building site may deliver a toolbox talk on 'Ladder safety' to a team of scaffolders.

By answering '*Those affected*' the manager is potentially missing opportunities to share their knowledge and experience of accident prevention especially if they have carried out an investigation and lessons have been learned. However, this also requires an audience willing to listen, which can be guaranteed in a domestic setting. Overall this scheme's statistics do indicate that there is a culture among residents but not necessarily a safety culture. It may be more appropriate to say there is a culture of behaving appropriately and following the scheme rules, but this is not managed or controlled by the manager. Therefore, it is possibly reasonable to conclude that this scheme does not have a 'positive safety culture', especially considering the manager lost most marks in the Communication and Management categories.

Schemes with the lowest number of recorded incidents

Scheme 6 Data	
Managers Score	95%
Residents Score	95%
Number of Fire-related Incidents	0
Compliance Score	98%
Scheme 38 Data	
Managers Score	81%
Residents Score	82%
Number of Fire-related Incidents	0
Compliance Score	78%
Scheme 40 Data	
Managers Score	89%
Residents Score	91%
Number of Fire-related Incidents	0
Compliance Score	93%

Figure 10: Schemes with no recorded fire-related incidents for the period

Schemes 6, 10, 38 and 40 did not record any fire-related incidents for the 3-year period. Working on the assumption that this is accurate, and that these schemes had no recordable incidents, the data does provide some interesting information.

Scheme 6 has an almost perfect score for both the manager and the residents and as previously mentioned, this does make the assessment of any culture very difficult to establish, and Scheme 10 has previously been discussed. The scheme lost most marks due to one respondent who

scored 69% overall whereas the rest of the respondents scored on average 98%. The only points lost in the Compliance category was one point, from one respondent. As with scheme 20 there is no evidence to suggest that anything other than a positive safety culture exists.

Scheme 38

The residents of scheme 38 responded poorly again to Question 1 with 50% stating that ‘*Convenience*’ was the most important factor of independent living. As this may be a significant finding, for this scheme in an attempt to identify a culture, this scheme will be split into two groups. Group A (the 50% ‘*Convenience*’ group) and Group B (the 50% ‘*Safety*’ or ‘*Community*’ group). As discussed previously, people should choose to live in sheltered accommodation because it has the added support of a scheme manager and a system wide alarm unit for emergency assistance. In theory, those living in the scheme for the right reasons will be engaged in the health and safety aspect of supported communal living, and those who do not require such support may not be so willing to participate in any possible culture.

Firstly, the scores were broken down into question category.

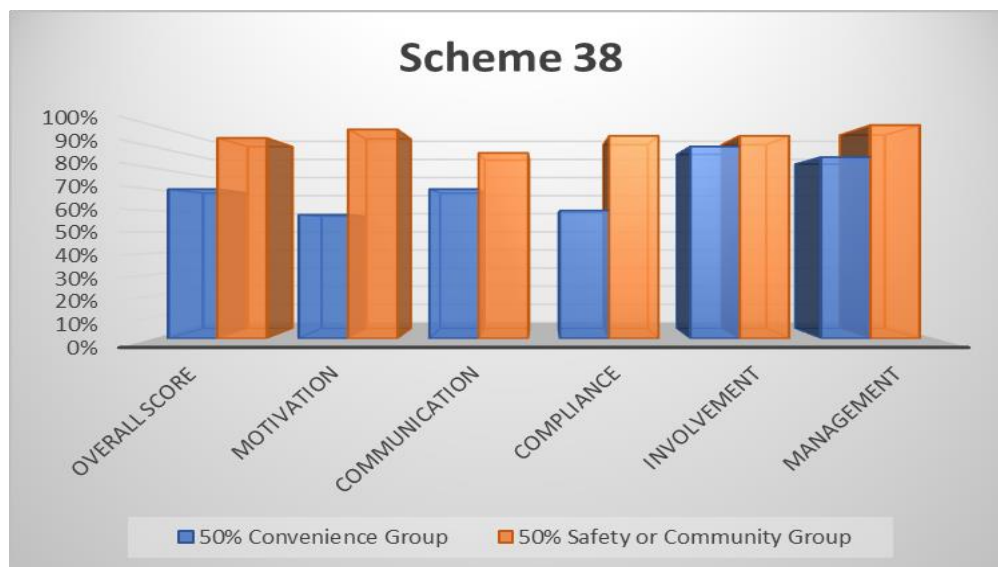


Figure 11: Scheme 38 Question 1 Opposing Groups

As Figure 11 illustrates, Group A, who are possibly not suited to be living in the scheme, are also the lowest scoring group for every category and by some considerable distance.

Having only scored 58% positively for motivation, this potentially is an early warning that health and safety will not be seen as a priority for the group who see sheltered accommodation as a convenient place to live. In contrast, Group B, who see the benefits of sheltered accommodation, and are therefore probably the right people to be living in the scheme, seem truly motivated and scored 98%.

Communication is a subjective issue. The author has experience of scheme residents that can be very difficult to communicate with, for a number of reasons. Some residents will not make time to speak with the manager, and others are simply not in the scheme during normal office hours and so the opportunity is not there. In some instances, even if the opportunity is there, residents simply refuse to converse with the manager due to what can be something as simple as a clash of personalities. After all, as the data shows especially in the case of this scheme, not all residents want the services of a manager and simply want the more affordable home. For Group B, Communication lost marks for Question 9 as it has in nearly all schemes, but Group A lost significant marks in the same category for Question 8, 9 and 10. They share the opinion that the manager does not discuss health and safety with either them, or their neighbours, nor does the manager explain what checks they are carrying out. Group B does not concur and scores 100% for Question 8 and Question 10.

Perhaps interestingly, Group A scored 90% for involvement questions when they all, or nearly all, agree that the manager would discuss new rules with them, and that they are afforded the time by the manager to discuss existing rules. This would appear to contradict their answers to previous questions regarding the manager's communication.

Q17 asks residents '*Are you 'safety conscious' when inside your flat?*'. With Group A answering only 30% positive for this question, and Group B answering 100% positive, the difference between the two groups is becoming even clearer. Group B scored 94% overall across the 5 categories. The manager of Scheme 38 scored 82% which put them in the bottom 25% of all the scheme managers, significantly losing marks for Compliance questions. This manager states that the scheme does suffer from having many false alarms, and that not all residents comply with the scheme rules. This then in itself is not acceptable. The manager also loses marks for Communication. Question 9 asks managers '*Do you display any health and fire safety rules for residents to see?*' for which they answered that they display rules for either health and safety **OR**, for fire safety, but not both. All schemes have notice boards where relevant information must be displayed and so there is specific place in all schemes to display all scheme rules. Question 10 asks '*Do you discuss new rules with residents before you implement them?*' The manager answered '*Sometimes*' which was also the opinion of Group A. It could be said then that there is the possibility that the more motivated the residents are, the greater the chance of them answering questions with a positive bias. Further research will be required to identify if this is the case. This scheme is unique in as much as it appears to have two cultures within the one scheme which are significantly different. Overall the scheme scored a poor 78% in the compliance category. But breaking this down into the two groups paints a different picture. Group B who are most suited to living in the scheme appear to indicate they are a part of a positive safety culture scored 95% in the Compliance category. Group A who see convenience as the most important factor of independent living scored only 60% in the Compliance category and so appear to be part of a 'negative safety culture'.

Scheme 40

Scheme 40 residents scored very highly with a 91% positive response to all questions and the manager scored 89%, placing this scheme in the top 50%. The manager lost marks for two questions in the Motivation category. They are not proud to work for their employer, and answered 'No' when answering Question 7 '*Do you have the time and resources to support residents that need help complying with the rules?*'. Again, the residents lost most marks for Question 9. But generally, their scores are very positive. As previously stated, with so little data in terms of gaps in the scores, or trends to analyse, it is impossible to make any assumptions with regards to what type of culture, if any, exists in this scheme. Whilst the scores indicate one exists, the very fact that the manager answered 'no' to Question 1 and Question 7 suggests that they are not providing the enthusiasm and support that residents would need in order to sustain a positive safety culture.

This scheme scored 93% in the Compliance category losing points again from only two respondents. This scheme then appears to have a positive safety culture among residents but is perhaps not supported by the manager in when it comes to maintaining it.

The number of incidents related to the culture

If the theory that a high number of incidents could be as a direct result of a negative safety culture, then the opposite would be true of a scheme with a low number of fire-related incidents.

Focussing on six schemes above, the data should give a clear answer to the possibility of a relationship between the number of recorded incidents and the overall culture in any given scheme. Four schemes all returned zero recorded fire-related incidents for the 3-year period. If the question of a relationship is true then all four schemes should have very high scores from

both the residents and the scheme managers which indicate the possibility of a positive safety culture.

Scheme 22 scored the highest and in theory has a very positive safety culture. Their recorded number of incidents was only 1. This suggests that the low number of incidents could be due to the existence of a positive safety culture.

Scheme 7 has suffered 11 recorded incidents. Non-compliance is possibly an issue in this scheme, but otherwise it scored highly. The number of incidents could be as a result of this non-compliance.

Scheme 10 had the lowest score from all residents and managers but had 0 recorded incidents. This suggests that there is no relationship. Or, if further investigation revealed that the scheme had a high number of incidents, but they were not being recorded by the manager it would continue in the same trend as the schemes 22 and 7.

Scheme 15 scored relatively high marks but lost most of their marks in communication and involvement. This scheme recorded 49 incidents, more than any other in the sample. This scheme's overall score indicates that there is not necessarily a positive safety culture but there is no reason to believe that there is a negative culture either.

Scheme 6 scored very high marks except for one respondent who responded negatively to many questions. With 0 fire-related incidents being recorded this again is as a result of a positive safety culture, or due to the fact that the manager is not recording incidents when they should be.

Scheme 38 with its two cultures, also had no recorded incidents so again it is inconclusive as to whether or not this is as a direct result of the cultures within the scheme.

Scheme 40 had no recorded fire incidents, and the manager is possibly the reason for the residents not scoring higher marks. This could also be the reason for the 0 incidents recorded.

Is the culture wider than the individual scheme?

The data all points towards the fact that a culture can exist in a scheme, and in some cases, one does. What cannot be concluded from the schemes above is if there is a bigger picture. Are there factors outside of the individual scheme that pre-determine the possibility of a culture existing inside one? The data from the respondents was further analysed by applying filters to particular groups and questions.

Previous research states that men, especially older men, are more at risk from fire than women. The data states this to be a fact, but does not say why, nor does it include the root cause. The data collected from the sample in this research may possibly provide an answer or at least point towards further potential research. The data was analysed by gender and age rather than by scheme alone.

Is gender a significant factor?

Not all respondents specified their gender so not all respondents will be included in this particular aspect of the research.

The top and bottom 3 responses to questions for men and for women were recorded and compared. If men are at greater risk than women as the Home office statistics suggest, then the results of this comparison may give some indication as to why this is the case.

Men top three questions	(Women score for this question)	Women top three questions	(Men score for this question)
1. Q3 – 99%	97%	1. Q4 – 98%	92%
2. Q18 – 95%	93%	2. Q3 – 97%	99%
3. Q21 – 94%	93%	3. Q17 – 96%	92%
Men bottom three questions		Women bottom three questions	
1. Q9 – 30%	50%	1. Q9 – 50%	30%
2. Q1 – 74%	93%	2. Q10 – 77%	79%
3. Q7 & Q10 – 79%	83% & 77% respective	3. Q7 – 83%	79%

Table 2: Top questions and bottom three questions by gender

When comparing the lowest three questions for both genders, both scored the least for Questions 7, 9 and 10. The men scored only 79% for both Question 7 and Question 10 and more significantly, had Question 1 as their second lowest scoring question. This means that just over 25% of all male respondents believe ‘Convenience’ is the most important factor of independent living. Only 7% of women agreed. Question 9 has proved to be significant in as much as both men and women had this as their lowest scoring question. With 50% of women stating that they do discuss health and safety with their neighbours, and only 30% of men stating the same, it may be relevant to the fact that men are at greater risk of fire than women.

According to this table, men feel safe in their schemes and put it down to the manager’s efforts. But conversely, with communication scoring low marks, it would indicate that they believe

safety happens without their input. It happens around them, which should suit them based on their answer for Question 1. This is not how a safety culture should behave.

What at first appears to be a subtle difference in the two groups may be significant. Women scored Question 4 and Question 17 in their top 3. This indicates that they are more willing than men to report incidents to the manager, and that they are more safety conscious in their own flat than men. This is a strong indication that women respond to questions as one would expect from the people that behave as though they are a part of a positive safety culture. This is a significant finding worthy of further research.

Perhaps the most disappointing results is that both groups have a high proportion (average of 22%) that believe the manager does not remind them of the scheme health and safety rules, nor do they discuss health and safety with them. This means nearly a fifth of all residents believe they have no direct conversations with the scheme manager regarding health and safety.

Overall this data does indicate that men are less engaged in health and safety in general than women and are not necessarily choosing to live in sheltered accommodation for the same reasons that women are. This then would suggest that a scheme with predominantly male residents would be a different cultural environment to a scheme with predominantly female residents.

Is age a significant factor?

Not all respondents confirmed their age group on their questionnaire. For this reason, the whole sample cannot be included in this particular aspect of the research. And only four respondents confirmed their age was between 86 and 95. So only the three most popular age groups will be discussed when investigating any potential trends by age.

When the respondents are split into age groups, the overall score in the **Motivation** category increases with age. Motivation covers two aspects. The core reasons for living in sheltered accommodation is that it should be a place of safety for people living in it, and that those living in it understand they have a manager to support them. This finding suggests that as residents age, the more value they see in the fact they are living in communal living with a manager.

- Age group 55-65 scored 89%
- Age group 66-75 scored 93%
- Age group 76 -85 also scored 93%

It should be noted that Motivation was the highest scoring of all the categories with an average score of 94.02%

Communication also increases with each age group.

- Age group 55-65 scored 77%
- Age group 66-75 scored 78%
- Age group 76 -85 scored 79%

This can be seen in one of two ways. Either with age people do feel that communication gets better and so they feel they are more aware of what is going on in terms of health and safety in the scheme, or, that with age communication is less important to the respondents and so they are less concerned. But significantly, all age groups gave communication low marks compared to the

other categories with an overall score of only 78% and with the difference between the age groups being only 1% this data is not conclusive.

When the bottom four answers from all age groups were selected another significant finding appeared. All age groups had the same four questions but interestingly the positive responses to Q1 which asks residents '*What's the most important factor of independent living?*' and Q7 which asks 'Does the manager remind you of the rules or regularly discuss them with you?' increased with age.

- Age group 55-65 scored 76%
- Age group 66-75 scored 84%
- Age group 76-85 scored 87%

The different scores in the age groups is further indication that with age, community and safety become more important to residents than the convenience factor. The fact that with age, residents believe that the manager discusses safety rules with them could be as a result of them now reaching retirement age and possibly spending more time in the scheme but further research will be required to confirm this possible reason.

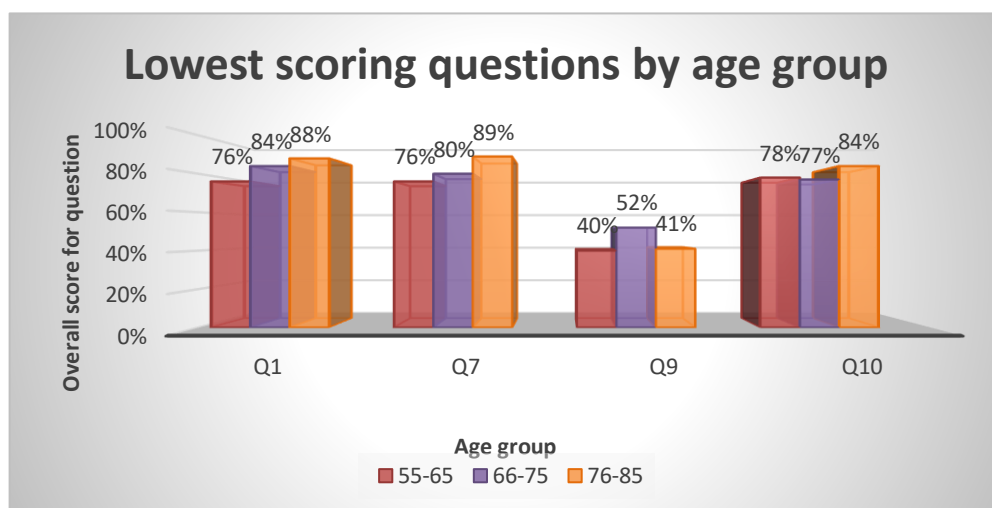


Figure 12: Lowest scoring questions by age group

Residents' scores by gender and age

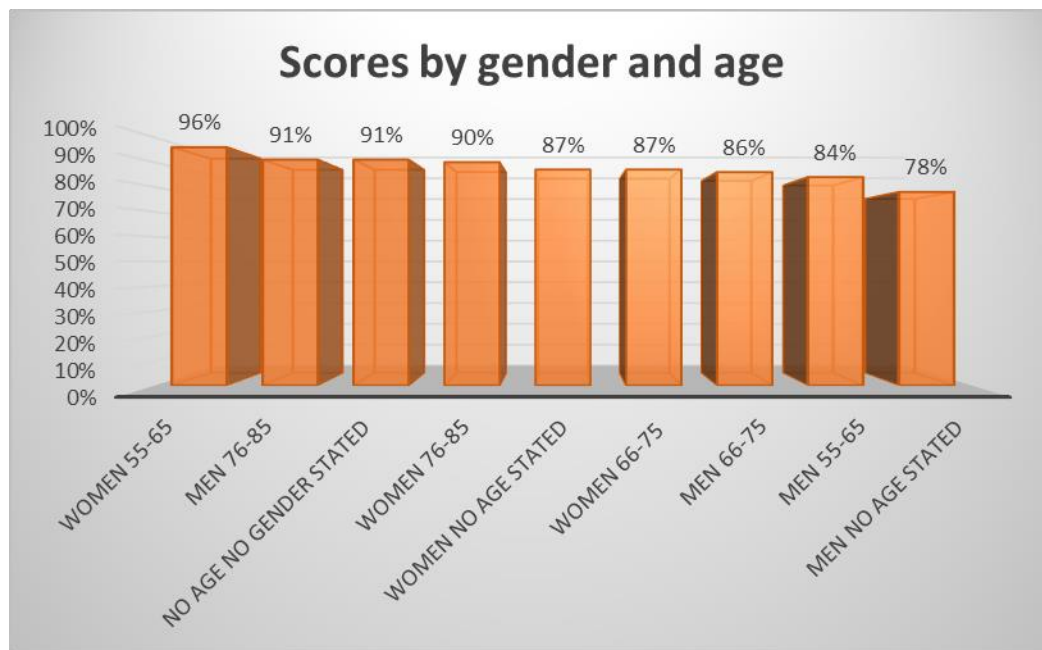


Figure 13: Scores by gender and age

The Combined men and women group 55-65 scored 87% overall and had an average score of 19 positive answers.

The Combined men and women group 65-75 also scored 87% and also had an average of 19 of their 21 questions being answered positively

Combined men and women 76-85 scored 89% and averaged 18 of their 21 questions positively.

Combined men and women Group that did not give their age only scored 67% and scored an average of 14 out of the 21 questions with a positive answer. The overall scores by age groups and gender:

Women aged 55-65 scored 96% (This score made this the most popular group of all respondents.)

Women aged 66-75 scored 87%

Women aged 76-85 scored 90%

Women with no specified age scored 87%

Men aged 55-65 scored 84%

Men aged 66-75 scored 86%

Men aged 76-85 scored 91%

Men with no specified age 78%

No age and No gender scored 91%

A trend has appeared in this data. The respondents who did not give their age scored the lowest or were joint lowest in their gender group. Despite the fact that this phenomenon occurred among the men's group and the women's group could be a coincidence but further research could discover why this is the case.

However, the group of respondents that did not give either their age or their gender scored highest, or equal highest. This is possibly because the respondents were keen to answer the questions and did not notice the top lines of the questionnaire.

Age then does appear to have an impact on the overall culture score. Men do appear to become more positive with age in terms of their scores, but with women there was no such trend.

11. Conclusion

This chapter discusses the findings and conclusion in respect of the available literature surrounding this subject, the aims and objectives of this research, and how this research paper could be useful in aiding future research.

The research does conclude that based on the available data, there is no relationship between the number of fire-related incidents in a sheltered housing scheme and the existence of a culture among the people living in it. It is therefore feasible that more research needs to be done in order to reduce the number of deaths and injuries in sheltered accommodation now that there is evidence to suggest the main cause is cooking, and people's ability to manage safely in their kitchen. The reason for higher or lower incidents is not necessarily related to purposeful behaviour, but more likely the age, mental capacity and physical ability of the resident(s). This is a significant finding and one into which further research should be carried out.

The literature review

Sheltered accommodation literature is widely available but that which was available to the author focussed on the benefits and perceptions of those living in it. The author could not find any literature at all that discussed how residents perceived health and safety and their scheme rules. The available literature was not current and therefore does not discuss the changes to social housing that has come about as a result of the RRO. The author has experience of visiting over 200 sheltered housing schemes and is of the opinion that all managers with a long career will state that the schemes are not the places they were when built. The lowering of the age in many from 65 to 55 has had a huge impact on the cohesion among residents. Add to this the fact that those who were wardens are now Managers, there is a different feeling among people in

sheltered schemes. This is an important phenomenon in relation to this research, but not one that the author could find any other research on in order to support this particular thesis.

Safety culture literature is widely available but the author could not find any that discussed culture in sheltered accommodation. Literature on safety culture is limited to any environment outside of a commercial one. As previous research has identified that people living in social housing blocks, especially flats, are more likely to not only be involved in a fire-related incident, the author is surprised more research has not been done in order to identify what can be done to target those most at risk. In social housing the residents are not employees, so the author hoped to find research that discussed how to overcome this obstacle. None was discovered.

Fire safety – Literature on fire safety is plentiful. There are guidance notes and books on all aspects of fire safety. The literature in this review gives an overview of the fire safety legislation but the review again highlights the deficiency in the available literature. All documents identify issues and tell the RP what they need to do. The elephant in the room is the fact that it is often the residents who do not comply with the rules, or act without permission, sometimes resulting in a breach of legislation or regulations. The available literature does not discuss this, nor does it offer management solutions in how best to overcome or avoid these situations.

The telephone interviews

The telephone interviews were a success in as much as they did provide a useful amount of data that was used to create the final research instruments. It would have been beneficial to have selected schemes with a high number of fire-related incidents, or health and safety incidents in general. This may have provided the author with a perhaps more issues to discuss, which in turn would have led to more detailed questions and possibly more revealing answers from

respondents. Ultimately this would possibly have resulted in the construction of a better more insightful questionnaire.

The aim of this research

The primary aim of this research was to investigate if the number of fire-related incidents in sheltered accommodation can be attributed to the existence of a safety culture. To achieve this the following objectives were satisfied in order to:

Identify the cause and root cause of fire-related incidents in sheltered accommodation.

The data collected from the AIMS database confirmed that the highest number of fire-related incidents by an overwhelming majority was as a result of residents cooking in their own flats.

As for determining the root cause, managers do not investigate all incidents and are not trained to carry out a full investigation into incidents, therefore there is currently no way to determine the root cause of any incidents on AIMS.

Determine if there is evidence of any attitudinal culture existing in a sheltered accommodation scheme that could have an effect on health and safety compliance.

The decision to use a cross sectional sample from the 1000 schemes whilst providing a lot of useful data was possibly not the most appropriate choice for this research. This is due to the fact that it was only feasible (from a workload perspective i.e., time needed to clean and code the responses) to allow ten respondents from each scheme. However, by setting the maximum number at 10, and not confirming a minimum, some schemes returned as few as two respondent questionnaires. Considering that some schemes have up to 60 or 70 residents, two cannot be considered as a sample of that scheme's population. The same could be said for ten respondents. A more realistic sample would be to focus on whole schemes, including all residents of that

scheme who would be willing to participate, and if the numbers are too few, then a different scheme should be selected. Other drawbacks to this method include the fact that it relied on residents volunteering. This possibly meant respondents were a biased sample willing to participate, when the case is that not all residents will feel the same way.

This research confirms that whilst any safety culture may be introduced or supported by the manager, it is the actions of the residents that would determine whether or not one existed, and if one does, whether it is positive or negative.

The respondent's questionnaires prove that a culture can exist in sheltered accommodation and in many cases, one does. This is especially clear in the scheme with two separate cultures born from different opinions on the main factor of independent living.

When examining the data on a scheme by scheme case, certain trends appeared that indicate that a culture of sorts does exist in sheltered accommodation. The manager's score and the score of their residents was nearly always related. The fact that the highest scoring residents had the highest scoring manager and the lowest scoring residents have the lowest scoring manager support this. Furthermore, when certain groups are compared to others, more evidence of cultural thinking appear. When comparing a group who, based upon their answers, are not the target beneficiary of sheltered housing to a group who are, the scores indicate that those who do not believe the most important factor is convenience, are likely to be more appreciative of the manager and their responsibilities. Perhaps significantly, when looking at this from a national perspective, the group of residents that believe convenience is the most important factor is mainly made up of men. 74% of men (compared to 92% of women) believe the most important factor of independent living is either safety or community.

It is reasonable to conclude from the responses for **scheme 15** that there is a positive culture.

There is then, no evidence from the data collected that proves or disproves that the high number of recorded incidents is related to the existence of any culture in this particular scheme.

It is clear that it is impossible to identify any type of culture, other than a positive one from the data of a scheme where all respondents answer nearly all questions with a positive answer.

Scheme 38 illustrates that there is a significant difference in the responses to questions from those that see independent living as a matter of convenience, and those that see the most important aspect as being the safety element or the sense of community. This possibly means that the culture is dependent on the resident's motivation for living in the scheme. Potentially then, the motivation questions should be altered to better reflect this.

What this is clearly highlighting however, is that the questions when following the traditional format of a workplace survey, is possibly not the best way to investigate this subject. Further research would possibly benefit from asking questions based on actual examples of fire-related incidents.

Another significant finding is the fact that Question 9 had a poor response rate with only 44% of residents saying that they discuss safety amongst themselves. This is an indication that over half of all residents possibly act independently in respect of health and safety and do not see the scheme as a group that should work together. Further research may explore if this is a step too far and ask if people see the scheme as a community full of like-minded people, or a community of individuals.

Determine whether or not a culture can be a positive or negative safety culture as commonly defined.

Based on the data above it is reasonable to state that in all schemes there is the potential for a culture to exist, and in many cases, one does exist. This culture does have an impact on the

attitudes of the residents living in a building. As the data for schemes 22 and 7 is so similar, further investigation will be required to understand the reason behind such a positive attitude among the residents in terms of safety, but both indicate that a positive safety culture exists.

Scheme 10 has a very low score but this appears to be driven by the fact that the manager does not appear to act as they are supposed to. Overall this suggests a negative safety culture, for which the manager appears to be responsible for. Schemes 15 and 40 tell a similar story. The results suggest that the manager could influence change. This is the sign of a culture in itself.

Scheme 6 returned a high score. This is further evidence that a positive safety culture exists within the scheme. The most significant finding of all the schemes came from Scheme 38. This scheme has two clearly different groups of respondents, which are separated by one opinion in particular, making this is the clearest evidence from all schemes that a culture can exist, and depending on the traits that make it different to others, it can greatly affect how people perceive health and safety.

Investigate whether or not there is a relationship between the population in a scheme and the number of fire-related incidents.

By examining the data retrieved from the AIMS system, it was immediately obvious that there would be difficulties in determining if there is a relationship between a culture, and the number of recorded fire-related incidents. This was due to a number of reasons including the fact that some managers do not record all incidents (as they are required to) and some have not recorded any at all. An example of this was an incident recorded as ‘Smoke in the kitchen’. Some managers do not record the cause of the incident or explain in detail the events that occurred. This information is important to the organisation when analysing the data and highlighting any trends. The author has experience of residents who deliberately choose to ‘burn’ their toast,

making this a preference, a lifestyle choice and not a smoke related incident. It was established early on in this research that data is affected by the ability and willingness of managers to properly investigate and record all incidents. The author has experience in the housing environment and believes that based on the data collected from the schemes in this sample, many schemes managers are not recording incidents when the company policy states that they should be. Poor reporting has potentially affected the results of this research. If further research is to take place it would be opportunistic to ensure that the scheme managers are asked to begin recording all incidents accurately long before the data is to be collected. For the purpose of this research all data was taken on face value.

Research methodology

Data collection method

The choice to use a postal survey was the most suitable for the particular sample group but there were drawbacks. It did mean that the author was requesting returns from already busy managers who had forgotten, or perhaps hadn't had the time, to open the survey packs. Only 30 of the 40 managers returned their packs which was disappointing considering the research would benefit them in particular but there was no way to overcome this. It was though overall the most suitable method for this particular research and yielded a substantial amount of data.

The response rate for all schemes was positive however it was clear that some schemes did not want to participate, some managers thought the correspondence was a test of their data protection knowledge (a test due to the recent change in legislation) and therefore disposed of the survey packs, and some managers did not return the packs nor did they give a reason as to why. It was

also the case that whilst some managers were looking forward to participating in such a large survey, others were not. This may have had a negative impact on the returned responses.

The research instruments

The resident's questionnaire did not make it clear enough for some that the age and gender question was important for this research and as a result was often missed by respondents. The questions too provided some issues when it came to categorising them as some could be seen as compliance issues, when in fact they may have been more to do with understanding the rules which could be seen as a communication issue. It was clear from the results that the questionnaire allowed respondents to say all the correct answers as they are based on what they have agreed to do in their tenancy agreement. It is possible that a more suitable set of questions would be scenario based which would have allowed for a more in-depth look at their behaviour.

The manager's questionnaire was a mixture of questions that would determine how they feel about the safety culture in their scheme, and the safety culture in the organisation as a whole. This did make interpreting their responses and comparing them to residents' responses difficult. A more useful tool would have focussed on their role within the scheme, and not included any questions on the wider topic of an organization's culture. The questionnaire did indicate that there is a wider issue, one that potentially has an impact on the way the manager manages. With all managers stating that they are '*confident to investigate all accidents and incidents*' when none have received proper training in this subject, it may also explain why the information inputted onto the AIMS database was lacking in detail, and why in some cases, the system was not used at all.

Whilst the aim was to establish if there is a relationship between the number of fire-related incidents and the possible safety culture that exists within a sheltered housing scheme, it has in fact indicated that there is possibly more significant research required for social housing that has not yet been discussed. Sheltered accommodation is supposed to be somewhere that people can move to and spend the rest of their lives knowing that they are living in a safe and well managed building with the added benefit of being among other like-minded people. People live in sheltered accommodation to maintain their independence. One problem with this is that there is not necessarily someone to tell an individual that they are now not as independent as they once were. And it is not always the case that an individual wants to admit that they are now dependant. This can on occasions not only put the individual themselves at risk, but the building and all the other residents living in it.

Who will find this research useful?

This research would be useful for safety departments in the fire and rescue services, and may influence their decisions when either auditing sheltered schemes, or passing comments on the plans they receive from building control in respect of new builds or alterations to existing schemes.

Residential social landlords are allowing more people of a younger age to move into sheltered accommodation blocks. Understanding the impact that people who do not require the services sheltered accommodation provides have on sheltered accommodation, is something they may find useful when considering what is best for their existing residents.

Fire risk assessors do not receive training that focuses on the different behaviour managers have to deal with in sheltered accommodation schemes, and there is no legislation that states only

those familiar with a particular environment should be allowed to give their assessment of the level of risk. The author believes this is an oversight in current legislation and one that should be addressed. This research indicates that the people living in the building influence how safe the building is, and the level of risk in a fire risk assessment should therefore take this into account.

12. Recommendations

Part 1 – Areas for employer – The Landlord

1. The main finding of this research is the difference in how incidents are recorded on the AIMS database. The author recommends that the organisation carries out a gap analysis in respect of scheme managers and their understanding and use of the AIMS to confirm whether or not all managers are aware of their duties with regards to entering incidents onto the AIMS database and any necessary training be subsequently delivered.
2. This research confirms previous research that younger people, men especially, do not necessarily choose to live in sheltered accommodation for the services that it provides, and that this can have a negative impact on the potential safety culture that exists in a scheme. Therefore, the landlord should explore the impact that this section of the population is having on the other residents and potentially offer additional support to managers of schemes where there is a larger than average population of younger men.
3. The research concludes that the scheme manager can influence the potential safety culture of a scheme and therefore identifies the crucial role managers play in the overall feeling within a scheme. This is something that the organisation could explore with regards to focussing on schemes with a high number of health and safety incidents.
4. The concept of a safety culture in a sheltered accommodation scheme is possibly something that has never been discussed. The landlord could consider being the first RSL in England to trial a programme and see if there is any evidence that introducing and promoting a positive safety culture in a scheme reduces the number of health and fire safety related incidents over a given period.

Part 2 – Areas for future research

1. The author recommends that further research should focus on specific schemes and investigate whether the age of a population can be analysed and used to predict the number of fire-related incidents, whilst comparing this to the management qualities of the scheme manager. The author believes that the different lifestyles between the age groups, and not just their actual behaviour, may be significant.
2. With cooking being the greatest cause of fire-related incidents in the data collected, further research is recommended to discover exactly why this is the case. This may mean exploring the significance of ageing, and cooking related incidents.
3. This research for ethical reasons excluded the participation of those with less than full mental capacity. The author has experience of people with capacity issues having difficulty cooking and in light of the data obtained from the database believes that further research should be inclusive of all residents.
4. Fire safety legislation dictates that the responsible person must ensure a fire risk assessment is carried out but does not specify to what extent. Further research may bring the fire authorities to the conclusion that the FRA should include a 'Culture Score'. How this can be achieved will depend on any future research but the author believes a matrix such as the one below may be suitable.

Figure 14 illustrates a possible methodology for giving a building an overall fire safety score.

The possible culture scoring system could be similar to a questionnaire for which answers score positive or negative points. The overall culture is scored according to the results of the questionnaire. 3 for a negative culture, 2 when no culture is identified, and 1 when there is a

positive culture.

		Severity (Based on construction & layout)		
		High = 3	Medium = 2	Low = 1
Culture	Negative = 3	9	6	3
	No Culture = 2	6	4	2
	Positive = 1	3	2	1

Figure 14: Possible Risk Assessment tool with culture score matrix

The severity could be the scored depending on the construction and layout of the building. A building with simple layout and good construction scores 1. A building with a complex layout, with poorer construction standards scores 3. The middle ground scores 2. The two numbers are then cross tabulated for an overall score.

A building with a high severity score and a positive safety culture is possibly safer than a low severity scoring building with a low scoring culture. This would indicate that although the structure of the building may be sound, the people living within it are still at risk due to either their own behaviour, or that of their neighbours.

This is not the topic being discussed in this research, but it is something the author believes is missing from fire risk assessments.

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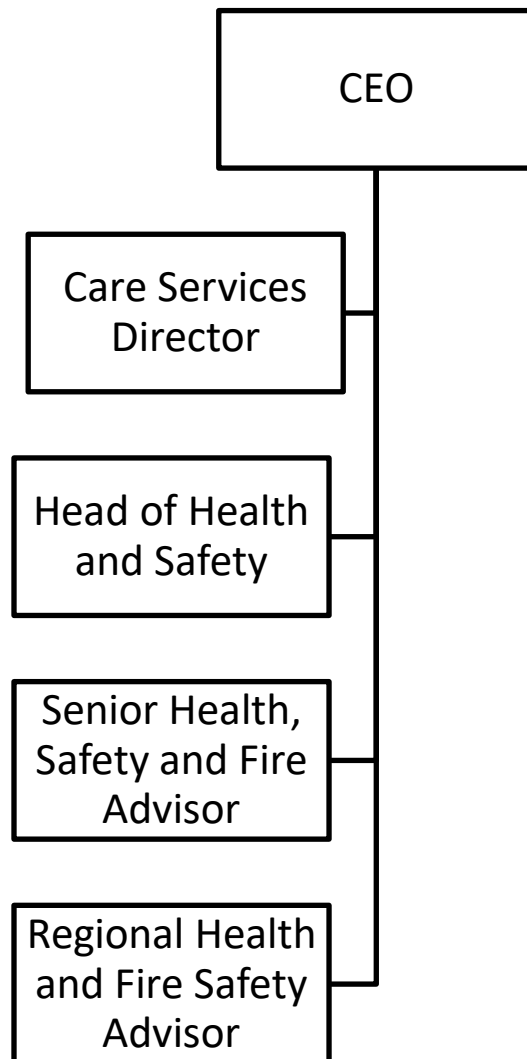
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15. Appendices

Appendix 1. Landlord Organogram



Appendix 2. Manager interview instrument

1. What comes into your mind when you use the term 'fire safety' when discussing it with customers?
2. Tell me about your safety and fire checks. Do people see you carrying them out?
3. Do you discuss with the customers what you have seen?
4. How do you discuss fire safety with the customers?
5. What is the customers attitude towards safety, in particular fire safety?
6. What do they do that's good/bad?
7. What do people do deliberately, good and bad?
8. What do people do that they don't mean to do?
9. Do they comply with the safety rules?
10. Smoking on the scheme, any issues?
11. Scooters, any issues?
12. Items in corridors and stairwells, any issues?
13. Safety in people's flats, are resident's safety conscious?
14. What should residents think about in terms of fire safety in their flats?
15. False alarms... do you have many? What causes them?
16. Residents that have presented any health and safety related issues, what ages are they? List them.
17. The scheme FRA, where is it held, what actions are outstanding?
18. Do you have a stay put policy?
19. Do people follow the policy or are there issues?
20. What do they do when the alarm sounds?
21. What's the difference between a near miss and an accident/incident with examples of all 3 please
22. What sort of incidents should you report, and how can/ do you report them?
23. How are new customers informed, and existing customers reminded about being safety conscious?
24. What sort of things do you tell them?
25. Can you tell me about any fire or smoke related incidents from the past few years?

Appendix 3. Residents' questionnaire

Please circle the appropriate answers. If 'Other' please explain.

Male/Female

Your Age 55-65 66-75 76-85 86-95 96-105

Q1 What's the most important factor of independent living?

Community Convenience Safety

Other _____

Q2 Would you tell others you are 'proud' to live in an *** building?**

Yes No Don't know

Other _____

Q3 Do you feel your scheme is a safe place to live?

Yes No Don't know

Other _____

Q4 If you had an accident, or was aware a neighbour had an accident, would you report it?

Yes No Don't know

Other _____

Q5 If you reported any accident to the manager would they investigate immediately?

Yes No Don't know

Other _____

Q6 Have all the scheme health and safety rules all been explained to you?

Yes No Don't know

Other _____

Q7 Does the manager remind you of the rules or regularly discuss them with you?

Yes No Don't know

Other _____

- Q8 Does the manager explain to you what safety checks they must carry out?**
Yes No Don't know
Other _____
- Q9 Do you ever discuss safety matters with your neighbours?**
Yes No Don't know
Other _____
- Q10 Does the manager regularly discuss health and fire safety with you or your neighbours?**
Yes No Don't know
Other _____
- Q11 Are you regularly reminded what to do if the fire alarm sounds?**
Yes No Don't know
Other _____
- Q12 When the alarm has sounded in the past, what did you do?**
Left your flat Stayed in flat Don't know
Other _____
- Q13 Is it OK to keep personal items in the corridors?**
Yes No Don't know
Other _____
- Q14 If your neighbours put pictures up on the walls in the communal areas would you too?**
Yes No Don't know
Other _____
- Q15 If the manager introduced new rules, would they explain or discuss them with you first?**
Yes No Don't know
Other _____
- Q16 Are you ever given the time to share your views regarding the scheme rules?**
Yes No Don't know
Other _____

Q17 Are you 'safety conscious' when inside your flat?

Yes No Don't know

Other_____

Q18 Do you feel the manager sees your safety as their priority?

Yes No Don't know

Other_____

Q19 Does the manager do enough to enforce all the scheme safety rules?

Yes No Don't know

Other_____

Q20 Do you see the manager carrying out safety checks regularly?

Yes No Don't know

Other_____

Q21 Do you feel the manager does enough to keep the scheme safe from accidents and fire?

Yes No Don't know

Other_____

Appendix 4. Managers' questionnaire

Manager questionnaire - Please circle your answers. If 'Other' Please add your comments on the line.

Q1 Would you tell others you are 'proud' to work for ***?**

Yes No Don't know

Other _____

Q2 Do you feel your scheme is a safe place to work?

Yes No Don't know

Other _____

Q3 Do you feel you can get the health and fire safety advice / support you require?

Always Never Sometimes

Other _____

Q4 Do you feel confident to investigate all accidents and incidents?

Yes No Don't know

Other _____

Q5 Is all of your health and fire safety training up to date?

Yes No Don't know

Other _____

Q6 Are you confident that you understand the reason behind all the organisations' policies and safety rules?

All Most Some

Other _____

Q7 Do you have the time and resources to support residents that need help complying with the rules?

Yes No Sometimes

Other _____

Q8 Do you explain to the residents what safety checks you carry out and why?

Yes No Sometimes

Other _____

Q9 Do you display any health and fire safety rules for residents to see?

Yes No Health OR Fire Only

Other _____

Q10 Do you discuss new rules with residents before you implement them?

Yes No Sometimes

Other _____

Q11 Do you know the difference between an accident, incident, and near miss?

Yes No unsure

Other _____

Q12 Do you record all incidents, accidents and near misses?

Yes No Don't know

Other _____

Q13 Do you investigate near misses as you would actual incidents?

Yes No Sometimes

Other _____

Q14 Are you familiar with the procedure for using AIMS and SUI forms?

Yes No Unsure of one

Other _____

Q15 Do you discuss recent scheme related incidents with residents?

No With all Those affected

Other _____

Q16 Would you say all residents are responsive to scheme rules?

Yes No Don't know

Other _____

Q17 Do you have many false fire alarms?

Yes No Don't know

Other _____

Q18 Do you regularly remind residents of the fire evacuation procedures?

Yes No sometimes

Other _____

Q19 Do you allow any personal decorative items in the communal corridors or stairwells?

Yes No Some

Other _____

Q20 What evacuation policy do you have?

Full evac Stay put Progressive Horizontal

Other _____

Q21 Does your office reflect your high standards of health and fire safety?

Yes No Don't know

Other _____

Q22 Are you aware of all the reasons why you have the evacuation policy that you do?

Yes No Unsure

Other _____