An Analysis of Hoarding Fire Incidents and MFB Organisational Response

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Abstract

This report represents a study of all identifiable hoarding related incidents responded to by the Metropolitan Fire and Emergency Services Board (MFB) in Melbourne, Australia within a three year period from April 2009 to April 2012. All of the incidents we included in this study were identified through formal and informal data collection methods and used to establish a database. This database allowed us to analyse these incidents and compare them to the previous MFB hoarding study and other MFB fire statistics to identify the demographics and characteristics of hoarding related fires. The results of this study will be used to improve the risk reduction advice given by MFB to hoarding households and to engage other agencies to develop a coordinated response to this issue.

Acknowledgments

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While all authors contributed to the editing of this report, Emily Colpas was the primary editor responsible for editing and assembling the report.

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Acronym Reference Table

Acronym	Meaning
ACAT	Aged Care Assessment Team
ADHD	Attention Deficit Hyperactive Disorder
AIRS	Australian Incident Reporting System
CFA	Country Fire Authority
CIR	Clutter Image Rating
DHS	Department of Human Services
DSM	Diagnostic and Statistical Manual of Mental Disorders
EMR	Emergency Medical Response
FIA	Fire Investigation Analysis
HACC	Home and Community Care
ICD	Impulse Control Disorder
LGA	Local Government Area
MFB	Metropolitan Fire and Emergency Services Board
MFD	Metropolitan Fire District
NFPA	National Fire Protection Association
OCD	Obsessive Compulsive Disorder
OoH	Office of Housing
RTO	Registered Training Organisation
STO	Station Turn Out
VCAT	Victorian Administrative Civil Tribunal

Executive Summary

Fire services worldwide respond to approximately 3.3 million fires per year, among which result in over thirty thousand deaths (Brushlinsky et al., 2006). One significant fire risk that has been recently gaining attention from fire services and media is hoarding. Hoarding is a behaviour involving the collection and inability to dispose of large quantities of possessions that interfere with ability to perform normal functions (Frost & Hartl, 1996). The accumulation of items in hoarding homes results in a higher fuel load and blocked means of egress, leading to fires that are more serious than other residential fires as they are tougher to fight and more likely to be fatal (Schorow, 2012). A fire spreading to or being ignited from a hoarding household poses severe hazards to firefighters and the surrounding properties and their occupants.

In 2009, the Metropolitan Fire and Emergency Services Board (MFB) in Melbourne, Australia was assisted by a team of students from Worcester Polytechnic Institute (WPI), Worcester, MA, USA to conduct a research study examining hoarding from a fire safety perspective. This study produced groundbreaking results, identifying that hoarding related fires occurring between 1999 and 2009 were responsible for 24% of all preventable residential fires and posed increased risks and costs to MFB and the community (Lucini, Monk, & Szlatenyi, 2009). MFB is committed to addressing this growing fire risk and is trying to improve both their operational response to these incidents and their system for directing people affected by hoarding to appropriate treatment programs and services. This task has proven to be difficult for MFB, as hoarding is still extremely underreported and there is currently no state-wide standard protocol that is specific for addressing situations of hoarding and referring affected people to services and treatment programs. There is a current gap in the research pertaining to these issues, which led MFB to conduct this second research study to quantify and analysis risks associated with hoarding and the effectiveness of MFB organisational response to these incidents.

The goal of this research study was to perform a comprehensive analysis of all the identifiable hoarding related incidents attended by MFB personnel within a three year period from 3 April, 2009 to 3 April, 2012. This study was intended to build upon the 2009 hoarding study conducted by MFB and was targeted towards an audience of those working in the field of hoarding and/or squalor and other fire and emergency service responders. The incidents analysed in this study include fires, emergency medical responses (EMR), and non-emergency incidents,

and these incidents were used to create a database that allowed our team to analyse the demographics of people affected by hoarding and the characteristics of hoarding related fires.

Research Methods

To achieve the goals of this study, we established a database that included all identified hoarding related incidents that occurred during the three year time period of this study. Since there is currently no standard system in MFB for reporting hoarding related incidents, we relied on formal and informal methods of data collection to ensure we had identified as many of these incidents as possible. This database was used to compare our findings to the results of the 2009 hoarding study and other residential fire statistics provided by MFB.

The primary source of data used for this study was the Australian Incident Reporting System (AIRS). An AIRS report is generated for every incident attended by MFB and contains all the information from the incident compiled into one organised document. In the current AIRS report, there is no specific place that asks the firefighter to indicate whether or not hoarding was present at an incident. We had to use a variety of search method to identify AIRS reports pertaining to hoarding incidents. The types of incidents we analysed were divided into three categories: fires, EMR, and non-emergency incidents. Fires were incidents involving a fire at the property, EMR involved MFB personnel assisting Ambulance Victoria, and non-emergency incidents were non-emergency responses such as lock-outs and welfare checks. The AIRS reports were identified through keyword searches in residential fire and EMR databases, as well as through email notifications of hoarding incidents to MFB Community Resilience. We used information from the AIRS reports to create a database of all the hoarding incidents that will be analysed in this study.

The database was constructed by identifying a number of categories of information and entering the information from the incidents into the database using the AIRS reports. After all the data was entered into the database, we were able to use this comprehensive list of information to analyse the data and identify any trends or patterns between these incidents. This analysis consisted of identifying the demographics of people affected by hoarding and examining the characteristics of hoarding related incidents, with an emphasis on hoarding fires. We compared our analysis of these incidents to the findings of the 2009 hoarding study to determine whether changes had occurred since the previous study. We also compared our results to data for other

residential fires attended by MFB during the same time period to confirm that hoarding fires are still more serious and require more resources to fight than non-hoarding fires.

Findings

Our study was comprised of 79 hoarding incidents which included fires, emergency medical response calls, and non-emergency incidents. The 79 hoarding incidents we examined took place between April 2009 and April 2012. There were many difficulties in acquiring data as the information provided by the AIRS reports was limited since there is no official area in the AIRS reports to recognize hoarding. Due to this limitation, we used several informal methods for finding more information on these incidents. On that basis, the 79 hoarding incidents included in this study are considered to be an underrepresentation of the total amount of hoarding incidents.

The study examined these hoarding incidents in as much detail as was available. In some instances, specific categories were able to be compared with the results of the 2009 hoarding study as well as average residential fire statistics. Within our results, fires represent 76% of the total hoarding incidents investigated and accounted for the majority of our data analysis. With 79 total hoarding incidents, the reporting rate for incidents within our analysis has quadrupled in comparison to the 2009 hoarding study. The 2009 hoarding study examined 48 fires within a ten year span. The reporting rate for the time frame of our study is approximately one hoarding incident every 13.8 days. Within the past twelve months, we determined this reporting rate to be one hoarding incident every 10.2 days. Some plausible reasoning can correlate the increased reporting rate to a range of internal MFB activities, such as the impact of the previous study on awareness of operational firefighters and information sessions promoting the need to identify hoarding and/or squalor conducted by MFB Community Resilience with senior operational officers.

We drew several conclusions about demographics. We obtained the demographical information using a variety of sources including AIRS reports, FIA reports, and emails. These sources provided data representing demographics of people affected by hoarding and hoarding fire characteristics. There were several instances where demographical information could not be found and were omitted from our analysis. We found that there were approximately equal percentages of males and females represented throughout all identified hoarding related incidents. In instances of only fire, there was a slight bias for males as they accounted for 53% of

the hoarding fires examined. Our study also investigated the age groups generally involved in hoarding incidents and found that the overwhelming majority were older people aged 65 years and over. This age group accounted for 73% of people involved in all incidents and 70% of people involved in a fire. Our results also suggest that the majority of the affected people living alone were older people. In regards to property type, we found that 64% of these incidents took place in houses, while apartments accounted for 28% of these incidents. We found that 19% of all these incidents took place in public housing although this percentage increased to 22% when examining only fires. Hoarding related incidents attend by MFB were widespread across the Metropolitan Fire District (MFD). Hoarding incidents occurred in 56 suburbs within the MFD, representing 19 of the 24 Local Government Areas (LGA).

We distinguished between the different causes for hoarding fires in our analysis. Our results in this section greatly differed from the 2009 hoarding study as cooking fires account for a much lower percentage of hoarding fires than previously found. Our study analysed the causes between electrical (23%), heating (18%), cooking (18%), smoking (17%), other (12%) and undetermined (12%). Causes listed under the "other" category included fires with a suspicious ignition factor. The most common cause of electrical fires was electrical overload. A large percentage of heating fires began due to combustibles being too close to heat sources. Cooking fires were typically attributed to unattended cooking. The most common points of origin for hoarding fires were areas used for daily living or areas where appliances are typically used, such as the kitchen, bedroom, lounge area, and laundry room.

Our study observed an increase in percentage of the number of hoarding households containing a smoke alarm in comparison to the 2009 hoarding study. The 2009 hoarding study determined that 60% of hoarding households did not contain a smoke alarm while our study observed 37% of hoarding households did not contain a smoke alarm with another 11% of undetermined status. However, there was still a smaller percentage of hoarding households with operational smoke alarms compared to average residential households, which contain an operational smoke alarm in 75.5% of cases. Our results demonstrated an increase of the percentage of hoarding households with smoke alarms, but this percentage was still lower than average residential households.

In comparison to the average residential fire, a larger number of personnel and appliances were needed to combat a hoarding fire. Our study revealed that the average number of MFB

operational personnel attending a hoarding fire was about 18.3 personnel, which was much greater than seven to eight needed for an average residential fire. The number of firefighting appliances needed to combat a hoarding fire is about 6.5 appliances, which was also much greater than the two or three needed for an average residential fire. The greater number of personnel and appliances has plausibly led to an increase in the percentage of hoarding fires that were contained to the room of origin. The 2009 hoarding study observed that 40% of hoarding fires were confined to the room of origin, while our results reveal an increase in this percentage as 60% of the hoarding fires we examined were contained to the room of origin. Although there was an increase in percentage for hoarding fires contained to room of origin, the average residential fire was contained to the room for about 82% of cases. This difference in percentage indicates that hoarding fires were still more difficult to contain in comparison to average residential fires. Our results also supported that a greater number of fires contained to the room of origin also exhibited a smoke alarm. We found the average estimated structural loss (AUD$) to have decreased since the 2009 hoarding study, as our estimated structural loss is about $85,737.25 in comparison to $100,100 determined by the 2009 hoarding study. We attributed this drop to the increased percentage of fires confined to the room of origin, the greater number of MFB operational personnel and appliances attending fires, and the increased smoke alarm compliance.

Conclusions and Recommendations

We drew many conclusions based on our results and findings, which reinforced many aspects of the current risk reduction advice given by MFB and brought attention to many new insights for integration. The amount of clutter blocking areas may also impede a hoarder from evacuating these incidents. Our results emphasised the need for installing and testing smoke alarms, as they are an essential tool in providing early warning and more time for self-evacuation. Unblocking exits and widening pathways are important as many AIRS descriptions depicted situations of firefighters having great difficulty accessing and moving within the premises. We specifically recommend removing clutter from heat sources as well as reducing any electrical overloads as these accounted for a large portion of heating and electrical fires. Many hoarding fires require the utilities of these households to be disconnected. However, hoarders do not generally seek the help of professionals to reinstall their utilities, leading to more

unorthodox methods and ad hoc arrangements for lighting, heating, and cooking. Due to these practices, referrals from MFB to request assessment or assistance for affected people which are directed to external agencies should be prioritised to provide early intervention, thereby reducing further risk from these unconventional arrangements.

Hoarding fires typically occurred in households of older, single occupants. However, the next most common household makeup consisted of households of families with children under the age of 18. While this number was much lower, it does demonstrate that children are in fact residing in these living conditions and that this requires a response which is reflective of current practice in relation to the identification of children in other high risk situations.

MFB internal engagement with operational firefighters on the risks of compulsive hoarding has resulted in greater increase in the reporting rate of hoarding incidents. Since our study shows that the risk is still significant, we recommend that MFB maintain and develop these internal engagement activities in order to build firefighter awareness of these issues. The positive outcome will be an increased reporting rate in addition to obtaining more information about the types of risks which people affected by compulsive hoarding are exposed to and how these can be addressed. Using AIRS data alone does not provide a complete incidence rate due to a general lack of awareness of hoarding and the severe risks it poses. We recommend promoting the inclusion of hoarding in AIRS reporting, ideally with the inclusion of the Clutter Image Rating (CIR) tool in the report itself. We strongly believe that there should be a dropdown box for hoarding in the AIRS report with the Clutter Image Rating Tool attached. This inclusion would provide a more complete set of identified hoarding fires and to develop methods for approaching these risks.

Chapter 1: Introduction

Every year, fire services respond to approximately 3.3 million fires that result in over 30 thousand deaths globally (Brushlinsky et al., 2006). Fires are a particularly prominent issue in Australia, taking a toll on the lives of the people as well as on the economy. In Australia, fires lead to approximately 100 deaths and over 3,000 injuries per year (Ashe, McAneney, & Pitman, 2009). The total cost of fire accounted for approximately AUD $12 billion, which is about 1.3% of the GDP in Australia (Ashe, McAneney, & Pitman, 2009). In urban areas, fires are especially damaging as the close proximity of buildings in such contexts increases the chance fires will spread to nearby structures, causing greater cost to the community through the loss of life, homes, community infrastructure and businesses. Containment of a fire is one of the primary challenges in firefighting. Firefighters prioritise containing a fire to prevent the fire from spreading and reduce the resulting damage.

One significant fire risk that has been recently gaining a lot of attention in fire services, the community, and media is hoarding. Fires in residential properties where there is hoarding increase the risk of a serious fire and are potentially more likely to make the fire harder to control and require more firefighting resources to contain it due to the abnormally high fuel inside and/or outside the residence. Hoarding is a behaviour involving the collection and inability to dispose of large quantities of possessions that interfere with ability to perform normal functions (Frost & Hartl, 1996). The practice of hoarding significantly increases the risk for a serious fire in a household due to increased change of ignition because of the accumulation of possessions. The volume of these accumulated possessions in hoarding households makes a fire more difficult to control and could also block means of egress from the structure. In a hoarding household where access is difficult due to the amount of clutter, there is an added risk to sending firefighters inside and anyone trapped inside has less chance of rescue or survival (Schorow, 2012). Due to these contributing factors, hoarding fires are more serious than other residential fires as they are tougher to fight and more likely to be fatal (Schorow, 2012). The relationship between hoarding and fire safety has not been fully documented, but the work of social scientists and fire service reports are revealing this important fire threat (Schorow, 2012).

The Metropolitan Fire and Emergency Services Board (MFB) in Melbourne, Australia, is the city's professional fire response service. In 2009, MFB was assisted by a team of students

from Worcester Polytechnic Institute (WPI) in Worcester, Massachusetts, USA to conduct a research study on fire risks associated with compulsive hoarding, which was the first study worldwide to examine hoarding from a fire safety perspective. This study produced groundbreaking results, including a comparison of the severity of hoarding related fires to other residential fires responded to by MFB operational personnel. The findings of this study showed that while response to other residential fires by MFB uses an average of 1.5 pumpers and 7.7 personnel, these numbers rise to 2.6 pumpers and 17.1 personnel when responding to a hoarding fire (Lucini, Monk, & Szlatenyi, 2009). The allocation of these additional resources cost MFB an average of $34,000 an incident, more than 16 times the average cost for other residential fires (Schorow, 2012). This extra cost can be attributed to the increased difficulty of containing hoarding fires to the room origin. In other residential homes, fires are generally contained to the room of origin in 90% of fire incidents; however this study showed that in hoarding homes, this percentage drops to about 40% (Schorow, 2012). The average damage resulting from hoarding fires was found to be about $100,000, while the average damages of other residential fires responded to by MFB is only about $12,500. In 2007, one extreme case of a hoarding fire in Melbourne resulted in damage costing over $700,000 (Lucini, Monk, & Szlatenyi, 2009).

Based on increased dangers and costs to affected individuals, responding firefighters and the community, MFB is exploring the most effective way to address the risk of hoarding fires and ensure people affected by hoarding are support to address their risk. This task has proven to be challenging as there has been little research and developed community practice on this issue. Aside from the previous MFB sponsored study in 2009, the amount of previous research done on this topic worldwide is extremely limited. While government has recently identified hoarding as an issue, there is currently no state-wide legislation specific to regulating hoarding or officially endorsed pathways of referral or treatment for people affected by hoarding.

MFB is committed to developing a better understanding of hoarding fires to support the development of effective risk reduction advice, increase firefighter safety and preparedness and ensure post-incident care is available and responsive. This aim of this research study is to support MFB to build on the body of the research it has already developed regarding this issue through a comprehensive analysis of the incidents attended by MFB personnel relating to hoarding since the initial study completed in 2009. This research is expected to be utilised by those working in the field of hoarding and/or squalor in other fire services, acute health, mental health, community

aged and disability services, public housing and those involved in research and the development of treatment for affected people. While the primary focus of the 2009 study was confined to MFB operational response to residential fires, this study included other MFB emergency response to other incidents including Emergency Medical Response, assistance to other emergency responders such as Victoria Police and Ambulance Victoria and other non-emergency incident calls received via "000", the national emergency response number. The aim of including incidents other than fires is to provide a detailed profile of the range of incidents in which MFB respond to emergencies in the homes of affected people and quantify other risks they experience.

Data from the Australian Incident Reporting System was used establish a database that includes all incidents involving hoarding that MFB has responded to over a three year period from 2009. This database was used to analyse information on the demographics of people affected by hoarding across the Metropolitan Fire District (MFD), including the age, sex, and suburb of the hoarding household. Characteristics of the hoarding fires during this three year period were also analysed in order to identify any changes since the 2009 study, as well as to compare these findings to other residential fire statistics for the same three year period to determine the effect of hoarding on the severity and damage associated with the these households. This data and resulting analyses will be used by MFB to refine the risk reduction advice to people affected by hoarding that MFB uses to decrease fire risks in hoarding homes. In addition, it is the hope of MFB that this study will raise awareness of the seriousness of these fire risks and contribute to the advancing understanding of hoarding fire risks worldwide.

Chapter 2: Background

The chapter explores the behaviour of compulsive hoarding from a number of different perspectives. The details and characteristics of hoarding are discussed as well as the involvement of MFB in promoting awareness of the fire risks associated with this behaviour. The government and community agencies involved with this issue are outlined to provide a comprehensive overview of current practice for helping and referring people affected by hoarding, identified by MFB through emergency response calls.

2.1 Compulsive Hoarding

Compulsive hoarding is a behaviour involving the collection and inability to dispose of large quantities of possessions that interfere with ability to perform normal functions. Hoarding is defined by three distinct characteristics: the acquisition and failure to dispose of an extensive amount of possessions that seem to have limited value; cluttered living spaces to a degree such that the spaces cannot be used for the activities for which they were designed; and significant distress or inability to function as a result of the hoarding (Frost & Hartl, 1996). The inability to discard useless objects suggests that possessions hold instrumental and emotional values that greatly exceed the actual value of these possessions. Hoarding behaviours are generally not deemed to be pathological except in cases involving extreme amounts of clutter (Steketee & Frost, 2003). In cases of clinically severe hoarding, the clutter makes the normal use of space impossible, even for everyday activities such as cooking, cleaning, sleeping, and moving around the space (Steketee & Frost, 2003). Additionally, people who hoard not only have a problem acquiring more possessions than their house can hold, but they also usually fail to organise these objects in a conventional way. This lack of organisation may also contribute as much to the inability to carry out necessary activities as the amount of possessions saved, as this lack of organisation makes activities such as finding important papers and paying bills more difficult (Frost & Steketee, 1999).

2.1.1 Causes of Compulsive Hoarding

The exact cause of compulsive hoarding has yet to be determined through several years of research, whether this behaviour is some part of a dimensional construct, a symptom of an additional disorder, or a disorder of its own (Steketee & Frost, 2003). Hoarding is estimated to

affect anywhere from 2-5% of populations across Australia, the United States, Canada, the United Kingdom, and Germany; to put this in perspective, schizophrenia, which is a well-known mental health condition, is estimated to affect only 1% of the population (Dr. Christopher Mogan, personal communication, 30 April, 2012). Hoarding can affect anyone, and it is not linked to age, gender, or socio-economic status (NeuroBehavioral Institute, 2011). Although hoarding has been compared with a variety of disorders, most of the research into its cause has focused on the apparent link of this behaviour to obsessive compulsive disorder, or OCD. In one study by Samuels et al., 126 patients with OCD were investigated for hoarding behaviours; out of this sample of patients, 30% exhibited hoarding symptoms (Samuels et al., 2002). It has also been discussed that the compulsive acquisition of possessions exhibited by people who hoard is an impulsive control disorder (ICD) referred to as "compulsive buying" (Steketee & Frost, 2003). Compulsive buying is defined as chronic, repetitive purchasing behaviour that is difficult to stop and has harmful consequences, and studies have shown compulsive buyers to exhibit high levels of hoarding behaviours (Frost, Steketee, & Williams, 2002). Attention deficit hyperactive disorder (ADHD) has been another proposed cause of hoarding behaviour, as people who hoard often present with difficulties in paying attention (International OCD Foundation, 2010). Other studies that have examined different aspects of this disorder have found that families of hoarders tend to exhibit higher frequencies of this behaviour (Samuels et al., 2002). The results of these studies may indicate a possible genetic component to hoarding (Steketee & Frost, 2003).

Currently, hoarding is listed as a symptom of OCD in the Diagnostic and Statistical Manual of Mental Disorders (DSM), which is the official diagnostic manual used to diagnose psychiatric disorders. The American Psychiatric Association has proposed to include hoarding as its own separate disorder in the newest version of this manual, the DSM-5, scheduled for publication in May 2013 (American Psychiatric Association, 2012). This inclusion of hoarding separate from OCD will officially establish it as a unique, diagnosable disorder (American Psychiatric Association, 2010). This formal recognition of hoarding as its own separate disorder is expected to change the current level of understanding and practice in relation to this chronic and progressive condition. These changes in practice are predicted to include increased education and knowledge, funding for research, treatment options and the development of best public policies for intervention by stakeholders such as local government, public and private housing services and community services support agencies including mental health.

2.1.2 Hoarding and Squalor

Hoarding can sometimes include squalor but it is important to distinguish between hoarding and squalor on the basis that squalor, with or without hoarding, has other underlying causes and requires a different intervention. Hoarding is defined by the Catholic Community Services, New South Wales, to involve "excessive collection of items (which appear to have little or no value) and a failure to remove or discard them" (Catholic Community Services NSW, 2012). In comparison, the organisation defines squalor as "a condition that is often described as filthy, unclean and foul and one which has come about through a lack of care and cleanliness or through general neglect" (Catholic Community Services NSW, 2012). While hoarding means that normal cleaning can no longer take place due to clutter, squalor generally appears as a build-up of rubbish and a lack of ability or intent to dispose of accumulated waste. Two experts in the area of squalor are Professor Steve Macfarlane (Caulfield Aged Psychiatric Assessment and Treatment Team) and Dr. Sook Meng Lee (Geriatrician, Western Aged Care Assessment Service). Both practitioners have extensive experience in hoarding and squalor with older patients (aged 65 years and over) in both a hospital and community setting. Their consistent observation in their experiences was that older people who live in squalor (including those who are transitioning from hoarding to squalor) could be assessed as living in squalor when they are physically and/or cognitively unable to maintain basic elements of their self or environmental care. Both practitioners also agreed that the indicators of squalor are one or more of the following: dead animals, animal faeces, rotting food, human waste, failure to self care and attend to personal care needs, lack of capacity to plan, loss of social skills and/or loss of inhibition.

In some of these cases, an underlying medical condition affecting cognition and/or physical capacity combined with the large accumulation of hoarding items may result in squalid conditions. In a limited number of these instances, appropriate medical treatment and practical assistance is enough to effectively address the issue and eliminate the squalor. In other instances, according to Macfarlane and Lee, the underlying issue behind the transition into squalor is frontal temporal lobe impairment. The frontal lobe is the largest lobe of the brain and is very complex, and is responsible for a large number of functions which include planning, organisation, insight, and impulse control (Dr. Steve Macfarlane, personal communication, 13 April, 2012). A person with frontal lobe impairment who is lacking any or all of these functions could easily transition into a situation of squalor as a result of their inability to plan and organise

the care of their living space or their possible lack of insight in maintaining a living environment. A diagnosis of frontal temporal lobe impairment is significant and in situations of squalor is likely to establish that an individual is no longer able to live independently in the community without support and, in extreme cases, result in the appointment of a guardian and permanent placement into residential facility based care (Dr. Sook Meng Lee, personal communication, 17 April, 2012).

The profile of younger people affected by squalor differs from the profile of older people in that it more commonly involves underlying causes including poor living and/or parenting skills, intellectual disability, medication, or mental health issues. This information was provided by Sarah Acreman, who works with Office of Housing (OoH), Department of Human Services, public housing tenants. Squalor, which the organisation also refers to as environmental neglect, is more often seen in this younger cohort and can include families with young children and require support to address a range of needs often linked to social and financial disadvantage (Sarah Acreman, personal communication, 4 April, 2012). Assistance and support in these situations can be complex but interventions are supported by the Office of Housings role as the landlord and the requirements of the affected person as the tenant to maintenance their place of residence.

Further clarification regarding the intersection of squalor and hoarding is still required as are the underlying causes and types of squalor experienced by people at different life stages and situations. This need for further clarification is supported by Professor of Psychology Michael Kyrios at Swinburne University, who has developed the first community treatment program for compulsive hoarding in Australia. Professor Kyrios advised that in his clinical experience, a hoarder may respond to their own hoarding and their attachment to their possessions in a way that can resemble the presentation of frontal temporal lobe impairment in an individual, even though they may not have this impairment or evidence of squalor in their home (Professor Michael Kyrios, personal communication, 3 April, 2012). These differing presentations support the need to develop research on a multi-agency basis with specialists working within these fields to ensure diagnosis, interventions and treatment maximise the potential for an improved outcome to address individual risk.

2.2 MFB Involvement in Hoarding

Metropolitan Fire and Emergency Services Board (MFB) in Melbourne, Victoria, Australia is Melbourne's career fire and emergency response service. They are responsible for protecting over 1000 square kilometres and 4 million residents in the Metropolitan Fire District (MFD) from fire, as well as providing search and rescue and emergency medical services. MFB is one of the oldest fire services, and today they are comprised of over 1,700 firefighters and 54 stations spread around the city of Melbourne and surrounding waterways. It is unique among all of Victoria's emergency response organisations in that MFB is mandated through MFB Act with the dual responsibility to respond to emergencies and pre-emptively reduce the risk of fire and increase community safety and resilience. The primary department responsible for community safety at MFB is Community Resilience, which conducts research on fire risks and safety and develops and delivers a range of community safety activities to fulfil their duty to the community to prevent fires as well as responding to fires (Metropolitan Fire and Emergency Services Board, 2009a).

In late 2007, three preventable fire fatalities occurred in the MFD within a three month period. All involved people aged 50+ years, but the only other common feature was that they occurred in homes where hoarding and/or squalor was clearly evident. Anecdotal evidence from firefighters also identified that they regularly responded to fires in these types of homes in their careers. MFB Fire Investigation Analysis (FIA) confirmed that fatalities occurred in these types of homes with some regularity, including some instances where multiple fires had occurred in the same hoarding homes. MFB Community Resilience also learnt that hoarding was a growing issue for government funded community support program providers.

As a result, MFB identified hoarding as an emerging risk on the basis of what appeared to be extreme fire risk to people living in these homes and responding firefighters in the event of a fire. The risks increased opportunity for ignition, the abnormally high fuel load increased the severity and spread of a fire, and the blocked internal pathways and doors were more likely to trap the occupant in the event of a fire due to the accumulation of possessions created. While the items being hoarded can include anything, the most commonly hoarded items, such as clothes, letters, bills and newspapers, are not only part of the fuel load but are highly combustible (Mogan, 2008). The large volume of hoarded materials made a fire far more likely to spread and more difficult to control (Frost, Steketee, & Williams, 2000). The volume of materials made

access difficult and blocks resident egress, adding additional risk to firefighters entering the property and reducing the likelihood of survival for anyone trapped inside (Schorow, 2012). These factors together make hoarding fires tougher to fight and more likely to be fatal than other residential fires (Schorow, 2012).

In the case of other residential fires, the risk for fire is eliminated once the fire has been put out; however in a hoarding fire, the risk for fire remains extreme even after the incident due to the abnormally high fuel load left in the home. While MFB Operations responded effectively and efficiently to hoarding fires, this knowledge combined with the responsibilities of MFB Act of 1958 required a response which would address the ongoing fire risk in hoarding homes. This information was crucial to the development of a strategic approach to the issue by MFB because while fire was the primary risk MFB needed to address, it was evident that individuals identified in hoarding related fires experienced a range of issues. On that basis, the objective of MFB was to engage key community stakeholders with a shared interest and responsibility in delivering an improved safety, health and wellbeing outcome for people affected by hoarding at policy program level (Julie Harris, personal communication, 24 April, 2012).

This position was further reinforced when MFB engaged subject matter experts in the field, Professor Michael Kyrios and Dr. Christopher Mogan. They were able to confirm through their research and clinical experience that there was no quick fix to hoarding. In fact, their advice was that quick fix methods such as the forced large scale removal of hoarded items would result in the replacement of these items within a very short time frame regardless of the age or resources of the affected person. This research reflected the early anecdotal evidence within MFB, which identified reoccurring fires in hoarding properties despite forced local council clean-up between each fire. Mogan and Kyrios's advice was that affected people required a range of long term supports inclusive of treatment and practical assistance through community support agencies.

On the basis of all this information, MFB organised a Hoarding Forum in 2008 to engage key stakeholders at a policy and program level across a range of government and community agencies and organisations. These included community aged care, community aged psychiatric services, community mental health services, disability, public housing, animal welfare, community nursing, local government environmental health and bylaws etc. The response to the event was overwhelming. Presenters at the event included Dr. Mogan and representatives from

key community, mental health, and housing providers with a focus on the current issues and what was needed to address this area of emerging risk. Forum participants also provided written feedback collected during the forum which overwhelming endorsed the need for a state-base task force.

2.3 2009 Hoarding Study

MFB was collecting an increased amount of information about its emergency response to hoarding fire incidents; this information was not based on formal analysis of all areas of the available data collected by the organisation. Engagement of key stakeholders substantiating the fire risk experienced by affected people through further research was vital in advocating for an all government approach to the issue. In 2009, MFB developed a hoarding incident and fatality study in partnership with a team of students from WPI. This study titled "An Analysis of Fire Incidents Involving Hoarding Households" was the world's first study to examine the issue from a fire safety and emergency responder perspective. The study covered a ten year period from 1999 to 2009 of fires which could be identified as involving hoarding in homes in the MFD. The aim of the study was to substantiate the associated risks, develop a better understanding of the overall nature of these fires and the people they affected, and if possible develop risk reduction advice based on the findings. The results of this study showed that hoarding fires were larger, more damaging, and more likely to spread beyond the room of origin than other residential fires. It was also found that although hoarding fires constitute only 0.25% of all residential fires, hoarding fires accounted for 24% of all preventable fire fatalities (Lucini, Monk, & Szlatenyi, 2009). This groundbreaking study was well received by hoarding researchers and has been cited in a number of publications, including the January/February 2012 cover article of the National Fire Protection Association (NFPA) journal in the United States and a recently published book, *The Hoarding Handbook: A Guide for Human Service Professionals*, which outlines more effective methods of social work practice in response to hoarding (Bratiotis, Schmalisch, & Steketee, 2011).

The study also provided a framework for MFB to build effective risk reduction advice based on the evidence from actual incidents. This advice prioritises key risk areas in the home, such as the need to clear around cooking areas, establish egress and check utilities, rather than the large scale removal of items from all areas of the home which research and advice already

established to be ineffective and only a short term outcome. As the areas of most risk involve the activities of daily living, addressing these areas not only reduces risk but returns functional capacity to affected individuals in these areas of the home.

Once the study was completed, MFB prepared a report for submission to the then state Minister for Police and Emergency Services. The report highlighted the significant risk to individuals, fire and other responding emergency services and neighbouring properties and advocated for an all-of-government approach to the issue to address the range of safety, health and wellbeing issues by affected individuals via the establishment of a state based task force.

2.4 Current MFB Position and Practice

The current position of MFB is that that most effective solution to addressing the fire risk of hoarding and/or squalor is through increasing knowledge about hoarding and improving the response of government funded programs in the provision of support to affected people. MFB contributes to this process through the development of research and advocacy at a local, state and national level via internal and external engagement. MFB also refers individuals affected by hoarding identified through emergency response for appropriate long term support to deliver an improved individual and community safety outcome.

2.4.1 Metropolitan Fire Brigades Act (MFB act)

MFB was established through the MFB act and is vested with the responsibility of fire safety, fire suppression and fire prevention services within the MFD. To this end, they are granted certain broad powers to prevent fires before they begin. MFB may enter any premise if they believe there is a fire risk for the purpose of removing that risk. MFB has never used this power in hoarding properties to enter a residential building without negotiating consent with the occupant/s. This mandate to pre-emptively remove a fire risk before a fire can break out is what has motivated MFB to seek solutions and reduce the risk of hoarding in Melbourne (Metropolitan Fire Brigades Act).

2.4.2 Internal and External Engagement by MFB

In addition to its community safety responsibilities, MFB also has an occupational health and safety responsibility for operational firefighters. Hoarding and/or squalor related emergency incidents present occupational health and safety issues for firefighters whose role is to protect life and property. In hoarding homes, the hoarding can be confined to the inside or the property or be inside and outside the property. It also commonly includes accumulated items stacked and/or stored against entry points such as doors and/or windows. To reach the point of origin in one fire which forms part of this study, responding firefighters were confronted with accumulated items packed solid to the roof line in every room and at every window and door. Access was gained by removing the kitchen window, demolishing the adjoining external wall and shovelling significant amounts of smouldering items to reach the point of origin. Once inside the property, firefighters are confronted with smoke-filled environments that have reduced or no visibility and items precariously stacked up to the roof line with narrow or even no internal pathways through the property at all. An incident included in the 2009 study also identified hoarding an incident where the occupant had hoarding tinned foods and other items within the roof space. As the fire progressed into the roof space, it collapsed dropping the large accumulation of these items into areas of the house in which firefighters were fighting the blaze. In hoarding and/or squalor related incidents in fires, EMR and assists to other emergency responders it can also include homes where there is infestation of vermin and human waste due to inaccessible or non functioning toilets. These issues present a strong imperative upon which to engage operational firefighters to increase their safety and preparedness when responding in these environments. This section will outline the practices MFB uses to engage people about the fire risks associated with hoarding and/or squalor both internally and in the community.

2.4.2.1 Recruits and Operational Promotion Courses

As a Registered Training Organisation (RTO), MFB develops and delivers training to operational firefighters from a recruit to senior officer level. Like other departments within MFB, Community Resilience participates in this training at all levels to provide information about the role of the department and its related activities and priorities. A key feature of firefighter training is to identify the role of firefighters in public education and safety and the positive contribution they can make in the delivery of improved safety outcomes. This training has been inclusive of

the issue of hoarding for several years and the emphasis has been on developing and increased organisational understanding of the condition, its link to urban residential fire risk and the need to take a proactive approach to hoarding related fires via reporting. The information delivered is also varied dependent on the targeted rank of the training course. At recruit level, the information delivered in the course is more general about the issue to raise awareness while at a senior level, such as the Senior Station Officer promotional course, more detailed information is included in the training. This includes the need for reporting these types of incidents, the referral process for affected people, the hoarding residential notification system and the broader strategies to engage key external stakeholders to address the risk and deliver long term improved outcomes for individuals, the community and operational firefighters.

2.4.2.2 Hoarding Presentations for Senior Firefighters

In May of 2011, MFB Community Resilience developed a hoarding presentation targeting operational Station Officers, Senior Station Officers and Commanders. The primary aim of the presentation is to provide information about hoarding and squalor, the increased reporting of incidents, the Hoarding Notification System, and the need to identify these properties so that affected people can be referred to address their risks.

2.4.2.3 Clutter Image Rating Tool

The Clutter Image Rating tool is used by MFB to assess the level of clutter in a hoarding related incident attended by MFB Operations. The Clutter Image Rating (CIR) is a nine-point visual scale developed by Frost, Steketee, Tolin, and Renaud in 2008. This scale was different from previous scales as it used a series of nine picture of a room with increasing levels of clutter and asked the subject to choose the picture that best resembled the clutter in rooms in their home (Frost et al., 2008). The use of a photo rating scale completely removed the use of confusing descriptions and eliminated the problem of different interpretations of clutter. It is also used when making referrals to external agencies. This tool has been included in Appendix B.

2.4.2.4 Internal Publications

MFB produces regular internal publications, such as Firecall and reports from the Chief Executive Officer. These publications deliver information about activities across the organisation

from an operational and community safety perspective. Articles on hoarding including information about the previous and current study, the hoarding forum and the growing rate of identified incidents have been included.

2.4.2.5 Hoarding Fact Sheet

MFB developed a fact sheet on hoarding which has been available via the MFB website since 2009. Based on evidence provided from the 2009 hoarding study, the *Hoarding; a lethal fire risk* page delivers simple practical advice to reduce the extreme fire risk experienced by affected people. This hoarding fact sheet is promoted in both internal and external engagement activities to increase knowledge about the condition and why prioritising risk reduction before a fire even occurs is the most effective approach to risk reduction in these homes. Following the completion of this study this information will be reviewed to reflect the findings and recommendations.

2.4.2.6 Hoarding Notification System

MFB has developed a hoarding notification system which involves placing a discreet electronic alert on hoarding property addresses. In the event of a fire or other emergency firefighters responding to an address with an alert are advised that the property is hoarding/high fuel load via the Station Turn Out (STO) information which is automatically generated for every emergency. The STO provides information for firefighters such as map and location coordinates and the inclusion of advice regarding hoarding is provided to increase their preparedness and safety when responding to emergencies in homes due to the high expectation that there will be issues related to their access, egress of the occupant and other hazards.

MFB will accept hoarding notifications via an electronic form from community agencies which have an established relationship and service agreement to work with an affected person. An additional criterion is that the agency has identified that there are working smoke alarms in the home or provided the assistance to install them as per the risk reduction advice which forms part of the electronic information pack sent to agencies who participate. The form does not include any provision for the identification of the occupant/s of the address through a name or any other personal information. After a period of 24 months, the system automatically generates an electronic renewal to the notifying agency and if not renewed the address is automatically

withdrawn from the data four weeks from the generation of the renewal. As new notifications are added to the data base, the system also generates each new property address to the region responsible for operational turn out in the area. Firefighters are able to perform a drive by of the address (which does not include direct contact with the occupant/s) to also identify if their operational experience also requires an automatic increased turn out of MFB appliances on the basis that hoarding is also visible from outside the home, the proximity of other dwellings and the locations of hydrants.

In addition to improving the safety and preparedness of responding firefighters, the system was also developed in response to the safety needs of affected people. Previously, support agencies had contacted individual fire stations to notify them of hoarding properties but this was done in an ad hoc way with no capacity for systematic renewal, assessment or data management. Reducing the hoarded items in the home of an affected person is a long process that requires establishing rapport and trust and then working with them over a long period of time. The aim of the hoarding notification system is to provide direction for this process via the risk reduction advice for the person, the agency supporting them and ensure in the event of an emergency responder firefighters are aware there is hoarding at the property.

2.4.2.7 Property Inspections

MFB Community Resilience receives requests from a range of community and regulatory agencies to inspect hoarding properties. These include Victorian Civil Administrative Tribunal Residential Tenancies List, Office of Housing, community support agencies, and in one instance a private resident's room in a registered Nursing Home. MFB performs property inspections to identify the intersection of the risk between hoarding and fire in the home and provide risk reduction advice to address the individual safety issues in a specific property. Protocols have been developed by MFB in relation to inspections which can only proceed with the consent and presence of the affected individual, the representative from the agency coordinating the inspection, and two MFB personnel.

The aim of the inspection is to support the community agency which has an established relationship with a client but where they have not been able to influence the client take positive action in relation to the hoarding in their home. The clients of these inspections usually do not understand or place a priority on addressing the risk in their home environment. In these

circumstances, MFB will visit to inspect a property and provide clear direction for clients to address the highest fire risk areas in their homes. This information is based on the MFB Hoarding Risk Reduction information sheet available via the MFB website and it has been included in Appendix D.

Following a property inspection, the individual and the agency who requested the inspection will receive a written report which clearly identifies the risk areas of the home and the remedial action which needs to occur. In one instance, MFB has performed four inspections of the same property at the request of the Victorian Civil Administrative Tribunal Residential Tenancies List as part of an order requiring the occupant of a privately tenanted property to reduce the hoarding in the home and maintain this at a low level. During the development of this study, a member of the research team was able to accompany MFB to an inspection of a hoarding property with the consent of the owner. The local council had received original notification of the property via Aged and Disability Services, which was contacted by one of the occupants to report the level of hoarding in their own home. The property, in an affluent area of metropolitan Melbourne, appeared structurally sound and was owner occupied by a couple aged 80+ years. The person in the household affected by hoarding had resisted all attempts by their spouse, family and friends. The person has also rejected privately purchased assistance, and in addition to refusing to discard any items, the person was actively collecting more items on a daily basis. The risk in this property for the occupants was evident in all areas of the home but particularly the bedroom, the main hallway and the entire front section of the house where the rooms were inaccessible. During the inspection, MFB identified that there were no working smoke alarms in the home. While assistance to install and maintain a smoke alarm could normally be accessed through the services of the local council via the Home and Community Care (HACC) Home Maintenance Service, the risk was assessed as too high to wait for this to be arranged. MFB supplied and installed smoke alarms during the visit and instructed the occupants in how to test them. MFB also advised the occupants of the fire and other safety risks in the property and the need for them to work with the local council services on offer to provide long-term support. During the inspection, MFB identified the key areas around the home which should be prioritised. Having previously experienced a forced large-scale removal of the hoarded items, the affected person conceded that there was more likelihood of their participation if their possessions were not removed again. They agreed to participate in an assessment with the

council worker for ongoing support. MFB prepared a report following the visit for the occupants and the council and has since been advised that the occupant has accepted the support and progress has been made to establish clear pathways inside the home and around both entrances.

In these circumstances, the role of MFB is to directly engage an individual in relation to their fire risk and reinforce the need to work with the community agency and practically apply the risk reduction advice developed by MFB. Following the inspection the already established relationship with a community provider can practically assist to implement, prioritise and reinforce the risk reduction advice.

2.4.2.8 News and Press Coverage

MFB participates in news coverage to promote community safety and resilience. This includes fire incidents of significance including those involving hoarding properties in local and state news services. The messages of MFB in these instances emphasise the high fire risk status of affected people and the need to seek long-term support.

2.4.2.9 Presentations, Conferences, and Forums

Since the Hoarding Forum in 2008, MFB has participated in hoarding and/or squalor forums, presentations and conferences. The aim of this activity is to increase awareness and understanding of the issue and its relationship to risk and to promote the results of MFB research and the risk reduction advice it generates. MFB Community Resilience receives requests on a weekly basis to present on hoarding at community service agencies and regional network meetings.

2.4.2.10 Internal Inquiries and Referrals

MFB via its role as an emergency service responder is in a unique position through which to identify affected people and link them to services which will address their risk and potentially provide ongoing support. Anecdotal information supplied by acute and allied health professionals and community service agencies also identified that people affected by hoarding are less likely to reveal this issue without a significant change in their circumstances or an event such as having a fire or requiring an ambulance at their home. In developing a response to hoarding and/or squalor, Community Resilience identified that in addition to the provision of an

operational response to emergency incidents it also needed to take additional action in ensuring the ongoing risks were addressed. Due to the chronic and progressive nature of hoarding and/or squalor, referring those affected through an operational response to an emergency in their home maximised the potential of reducing risk in the long term.

MFB firefighters can refer an affected person identified through an operational response to MFB Community Resilience. In these instances, consent for a referral is obtained by the firefighters at the scene or through a follow up phone call to the person. On the basis of the age and circumstances of the individual/s, MFB then identifies the most appropriate agencies to engage and assess.

If the occupant has been transported to hospital due to injuries sustained in the fire, social work at the hospital is contacted to advise that it has been identified that the person is living within a hoarding and/or squalor property. The aim of contacting social work is to ensure that the person is assessed and referred for services prior to their discharge home where the risks remain and may be further affected by an injury or incapacity. It is not within the scope of this report to assess the long-term outcomes of these referrals but it is clear that without an integrated, consistent and all-of-government approach the risks experienced by people affected by hoarding will remain high.

Due to a lack of a consistent level of knowledge about hoarding and the range of risks affected people experience, the acceptance of these referrals to the same government funded program in different regions is inconsistent. In some instances these referrals require a high level of advocacy despite the provision of information from MFB which fits existing program eligibility criteria. This experience is not confined to MFB and is documented in the *Discussion Paper-Hoarding and Squalor* published by Aged Care Branch, Department of Health (Aged Care Branch, 2011). Without the assessment and engagement of government funded programs and the provision of support and treatment, the level of fire and other risks remains.

2.4.2.11 External Inquiries and Referrals

MFB receives referrals and inquiries regarding hoarding properties and affected individuals from a range of sources. These include local government environmental health, by laws and aged and disability, animal welfare agencies, community legal services, social workers in acute health and rehabilitation services and providers of community housing, public housing,

rooming houses, private rental accommodation, Community Aged Care Packages, Extended Aged Care at Home, community mental health services, Veterans Services etc. From 2007, referrals more often relate to an agency seeking to advise MFB of the fire risk in a property. Inquiries are consistently for more information about fire risk and hoarding generally.

2.5 Related Activities outside MFB

There are a number of organisations in addition to MFB that are dealing with hoarding and the risks associated with this behaviour. This section will provide a brief overview of some of the organisations in Australia that interact with MFB and provide services for people affected by hoarding.

2.5.1 Country Fire Authority (CFA)

The Country Fire Authority (CFA) is a volunteer and community based fire and emergency services organisation that operates throughout rural and regional Victoria as well as Melbourne's outer suburbs. They protect 3.3 million people and over a million homes and property. CFA and MFB work collaboratively across a broad range of issues and campaigns in the state of Victoria. Since MFB identified hoarding and squalor as an emerging fire risk in 2007, it has engaged with CFA in relation to the issue and identified opportunities to work collaboratively. In 2011, CFA Community Development department engaged Ms. Debby Andre as a project officer to examine the issue of hoarding from a CFA organisational perspective and that of key external stakeholders within their area of regional responsibility. Ms. Andre has undertaken extensive consultation and has identified the following in relation to hoarding and/squalor.

Quantifying an actual occurrence rate of hoarding and/or squalor incidents within the CFA has been problematic which is reflective the early experience within MFB when first identifying this issue. The lack of an organisational agreement on what hoarding and/or squalor is and the importance of identifying it is likely to result in a low identification rate. Without this knowledge or understanding reports of hoarding and/or squalor, fire incidents are often not represented in reporting and remain anecdotal, if noted at all. Despite this, a small number of CFA Regional Operations have a high awareness of hoarding and/or squalor and the risk it poses

to individuals, responding firefighters, and the community (Debby Andre, personal communication, 22 March 2012).

The growth of hoarding and/or squalor as a risk issue in the community care sector is not confined the Metropolitan Fire District. Key agencies across housing, mental health, aged care, and disability services have prioritised this risk issue as an important issue to the government funded services they provide to the community in CFA areas. This prioritisation has resulted in a high profile number of Hoarding and Squalor forums including Bendigo, Mornington Peninsula and Geelong with an emphasis on a multidisciplinary, multiagency approach. The action of the community sector is in contrast to the lack of evidence within CFA regarding emergency or other response hoarding and/or squalor incidents within the same areas (Debby Andre, personal communication, 22 March, 2012).

Ms. Andre has identified a higher number of CFA emergency incidents in which hoarding was identified not through fire but to assist Victoria Police in some capacity in a hoarding property (personal communication, 22 March, 2012). Similar incidents are part of the MFB profile of operational engagement with hoarding and/or squalor properties and involve assisting Victoria's Police with entry for a welfare check or assisting Ambulance Victoria to remove a patient from within a hoarding and/or squalor property. Additionally while responding to the 2011 floods in Victoria, CFA crews in some affected areas identified a number of hoarding properties when their owners sought assistance (Debby Andre, personal communication, 22 March 2012).

The scoping report for CFA has clearly identified that hoarding and/or squalor does not stop on the boundary between MFB and CFA. Indications from external agencies within the CFA region are clearly experiencing the same challenges when seeking to address or intervene in hoarding and/or squalor situations. Ms. Andre has identified a key objective being the need to develop an internal engagement process in regard to hoarding to increase firefighter awareness, provide a definition to identify hoarding and develop a central point at which to receive this information and develop a coordinated response (personal communication, 22 March, 2012).

2.5.2 State Hoarding Task Force

The Aged Care Branch, Department of Health has convened a Hoarding Task Force following their development and distribution of a *Discussion Paper-Hoarding and Squalor*

(Aged Care Branch, 2011). The group includes key stakeholders from across a range of government and community agencies including MFB and CFA and experts such as Dr. Christopher Mogan, Professor Michael Kyrios, Professor Steve Macfarlane and Dr. Sook Meng Lee. The objectives of the task force are to establish working definitions and identify referral, intake, assessment, and support pathways for affected people.

2.5.3 Treatment Program at Swinburne

In terms of making referrals or responding to inquiries, MFB insures that information about the available treatment options is included. The treatment program at Swinburne University, developed by Professor Michael Kyrios, was designed to help those affected by compulsive hoarding through techniques of cognitive behaviour therapy. This treatment program was the first community treatment program for compulsive hoarding in Australia. These sessions allow people affected by hoarding to deal with their issues on their own by teaching them how to categorize their possessions, teach them decision making, and to help them find an area to store their possessions. The treatment group has itself been effective as these group sessions have shown support for these people. Attendance is subsidised by the national health care program, Medicare, and at the time of writing had over 80 people on a waiting list (Crawford, 2012).

Chapter 3: Methodology

This research study will assist MFB in confirming that hoarding incidents are still underrepresented within the current reporting system and changing risk management practices to minimize fire risk in hoarding households. The findings of this analysis will provide MFB with increased leverage to change government practices and to accomplish their mission of "protecting our community", as well as to contribute to the safety of the community. The aims of this research study were fulfilled by accomplishing the following objectives:

- Establishing a database to log all officially recorded hoarding related incidents that the MFB has responded to from 3 April, 2009 to 3 April, 2012

- Analysing information within the database on demographic characteristics relevant to hoarding behaviours and characteristics of hoarding incidents

- Comparing of these findings to the results of the 2009 hoarding study and other residential fire statistics

- Reviewing the current MFB risk reduction advice to refine the advice based on the results of this study

3.1 Methods for Data Collection

There is currently no standard system in MFB for reporting a hoarding incident on the basis that the post-incident data collection system (which is a national data base) has no specific area in which to identify hoarding and/or squalor. Due to this, these incidents were identified through a variety of formal and informal data collection methods.

3.1.1 Australian Incident Reporting System

The Australian Incident Reporting System (AIRS) is the standard place to look for information regarding an emergency response incident attended by MFB. Every incident MFB responds to is entered into AIRS, which is a reporting system consisting of eleven blocks that are filled out by firefighters after they attend an incident. The blocks are organised by the categories shown in Table 1.

Block A	Complete for all incidents
Block B	Protected premises information
Block C	Hazardous Materials
Block D	Casualties, rescue and evacuation
Block E	Ignition (all fires)
Block F	Fire Fighting
Block G	Wildfires (grass, bush and forest)
Block H	Dollar loss fires
Block J	Mobile property details
Block K	Structure fires

Table 1: Eleven Blocks for AIRS reports
(Australian Fire and Emergency Service Authorities Council, 2009)

The blocks contained in the AIRS report indicate the specific type of information about the incident that can be found in that section of the report. This information includes a variety of details about the incident it represents, including the location of the incident, the type of incident that occurred, the attendance of MFB operational firefighters to the incident, and the estimated damage costs. The incident comments are attached to the back of the AIRS report, which is a copy of the radio transcript that occurred during the incident. Each individual AIRS report has a unique call number which can be used to identify that particular incident and retrieve it. These reports were the primary source of information used to construct and complete the database, as they contained the largest and most accurate set of data regarding each individual incident identified during the data collection stage of this project.

In the current AIRS report, there is no place that directly asks the firefighter to indicate whether or not hoarding was present. The only places we found mentions of hoarding were in Block A where the firefighter can write a brief description of the incident or in the radio transcript included at the end of the report. These transcripts represent the radio communication that occurs during an incident, and they proved to be a useful source for comparison of specific details of the incident to the details that were documented in the AIRS report. It became apparent after comparing the radio transcripts to the other block of the AIRS reports that there were occasional discrepancies between them. The transcripts were used as a cross-reference to the information contained within the AIRS report to ensure that the most accurate information available was used for each incident. However, since there is no section on the report asks for the firefighter to note whether or not hoarding was present at the incident, it is often not mentioned

at all in the report. We had to search for other ways of identifying relevant AIRS reports that did not mention hoarding.

3.1.2 Type of Incidents Analysed

Our team began this study by reviewing the 2009 hoarding study, which had only examined hoarding incidents involving fires. However, since this previous study, MFB wanted to broaden the collection of data to include the other kinds of emergency response calls that MFB would identify these properties through. In addition to fires, MFB responds to emergency medical responses (EMR) with Ambulance Victoria, assists Victoria Police in welfare checks to gain entry to property and also assists Ambulance Victoria to remove patients for transport to hospital. These incidents presented MFB with additional risks and challenges similar to those identified by the previous study to be associated with fires, such as blocked access and egress. For the purpose of this study, the incidents were divided into three categories: fires, EMR, and non-emergency incidents. Fires were incidents that MFB attended involving a fire at the property. EMR involved MFB personnel assisting Ambulance Victoria on a call for incidents such as a non-breathing patient. Non-emergency incidents were non-emergency responses attended MFB such as welfare checks, lock-outs and lock-ins. All incidents included in this study were official emergency response incidents, meaning the incidents were received through triple "000" for MFB to respond to the emergency.

In an ideal documentation of an incident involving a hoarding property, the presence of hoarding would be documented in the AIRS report and a follow-up email would be sent to MFB Community Resilience with additional details so Community Resilience can refer the person for help that will address the range of safety, health and well-being issues. In many cases, this occurs but no note of hoarding is in the official report. This lack of consistent reporting meant that our team had to devise ad hoc methods for identifying hoarding incidents. On this basis, our team believes that it has not identified all hoarding and/or squalor incidents and that the number of hoarding incidents in this study is an underrepresentation of the actual rate at which they occur within the MFD.

3.1.3 Keyword Search Method

Between the dates of 1 January, 2009 and 4 March, 2012, MFB responded to 5,648 residential fires. All of these fires were recorded in a database containing their AIRS call number

and relevant information about the fire, including the AIRS description of the incident. From this list of these residential fires, our team had to determine which of these fires involved a hoarding property. This proved to be a challenging task as neither the AIRS reports nor the database for these fires had a place for a firefighter to identify if the property was a hoarding property, so there was no uniform method for determining whether a fire was a hoarding related fire or not. In order to identify hoarding related fires, our team developed a keyword search method. We familiarized ourselves with the language used by firefighters to describe a fire they attended by reading through several AIRS reports and the *Discussion Paper-Hoarding and Squalor* (Aged Care Branch, 2011). Julie Harris also provided us with several AIRS reports for fires which clearly stated that the fires occurred in hoarding homes, so our team was able to read through those reports, particularly the description of the incident in Block A and the attached incident comments, to become familiar with the vocabulary firefighters might use to describe a hoarding fire.

Through this process of exposing ourselves to the common language used by firefighters, we were able to identify a list of 77 keywords that could occur in AIRS reports that might be indicative of a hoarding, such as "hoarding", "hoarder", "stored, "rubbish" and "clutter". Some of the less common words that could also be indicative of a hoarding even were words such as "access", "discarded", "accumulated" and "material". Through reading the AIRS descriptions, it became apparent to us that words are regularly misspelled in these reports. Therefore, we also included a number of misspellings in our list of keywords, including "horder", "rubish", "acumulated" and "cluter". The complete list of keyword has been included in Appendix C. All keywords were used to electronically search through all the other resisdential fires within the time frame of the study. Each keyword was individually searched for in the database to identify all the fires that had that particular keyword in their AIRS description. These keyword searches yielded 40 fires that were identified as either definite or possible hoarding fires. The definite hoarding fires included reports that mentioned hoarding or contain clear descriptions of the presence of hoarding at the property. Out of the 40 potential hoarding fires identified through our keyword searches, only 10 mentioned the word "hoarding" or some derivative of the word like "hoarder" or "hoard". The possible hoarding fires we identified included reports that had descriptions that could indicate the presence of hoarding but the description was not clear enough to confirm whether or not hoarding was actually present at the property. In these cases, we

further investigated these instances to obtain more information of the fire, either by personal communication with an officer that attended the incident or through FIA, to confirm whether or not the possible hoarding fires we identified were definite hoarding fires. At the end of this keyword searching process, we had identified 25 definite hoarding fires.

This method of keyword searching for hoarding fires was also used to identify the EMR and non-emergency incidents involving hoarding that would also be included in this study. We received a second database containing all of the incidents other than fires to which MFB personnel respond. Between the dates of 3 April, 2009 and 29 March, 2012, MFB personnel responded to 29,819 incidents involving EMR and non-emergency incidents, which were organised in this second database. The same list of 77 keywords was searched in this database for using the same method that was previously used to identify hoarding fires. We identified 4 EMR incidents and 2 non-emergency incidents all involving hoarding using this method of searching for keywords. In total, we identified 31 incidents using these keyword searches that involved hoarding and were attended by MFB personnel in the three year period included in this study. The AIRS reports were obtained for each of these incidents, and could then be used to gather information about each of these incidents to be used to construct a database characterizing the nature of these incidents.

3.1.4 Informal Data Collection

The keyword search for hoarding incidents was limited by the inadequacies of the use of the AIRS report to record the presence of hoarding at an incident. Our team discovered that firefighters were more likely to informally report hoarding incidents directly to MFB Community Resilience rather than in the AIRS description. In most incidents, this included highly detailed information required to refer the affected individual. The related documentation of these referrals was kept by MFB Community Resilience as a record of the hoarding related incident and of the referral. We were able to use these documents to identify the related AIRS report for these incidents to use in our database. These emails usually contained some sort of identifying piece of information, such as part of an AIRS call number, a date, photographs of the incident, or an address, which could then be used to obtain the AIRS report for the incident to add to our collection of hoarding incidents for our database. By these informal methods of examining email notifications and photographs from firefighters, 48 more hoarding incidents were identified,

bringing the total number to 79 hoarding incidents attended by MFB during the three year time frame of the study. Even though this informal method of collecting data identified a large number of hoarding incidents, this method of relying on informal email notification leaves gaps for incidents to go unreported. Due to the gaps in the system for reporting these incidents, we expect that this is still a large underrepresentation of the number of hoarding related incidents that occurred.

3.2 Database of Hoarding Incidents

We created a database using all the AIRS reports we collected for all the hoarding incidents within the given time period from 3 April, 2009 to 3 April, 2012. We determined a number of areas of focus to include as categories in the database based on the information available within the AIRS. Details about each hoarding incident were recorded within this database for each of the categories to create a comprehensive list of information that allowed us to compare the hoarding incidents. These details were used for further analysis into the nature of these incidents and for comparison to other residential fire statistics and to the findings of the 2009 hoarding study.

3.2.1 Construction of the database

The database was constructed by entering information from each incident into a spreadsheet. The information entered into this database was organised into categories to allow for comparison of the details of all the identified incidents later on in analysis. We selected categories by identifying all aspects of the AIRS reports that could potentially provide not only a comprehensive analysis of the data, but also additional information or insight into hoarding that has not yet been focused on in previous research on hoarding from a fire safety perspective.

3.2.2 Data Analysis

After all the data was collected, we began to analyse the data and examine any trends or patterns found between these incidents. MFB will use this analysis to refine the risk reduction advice they use during property inspections of hoarding homes based on the trends and patterns in the data relating to the demographics of hoarding incidents and the characteristics of hoarding related fires. This updated information will help MFB identify a target population among which

hoarding appears to be most frequent and help them give people identified as affected by hoarding the most current information about the risks associated with hoarding behaviour. We examined a number of features recorded in the database common to all three types of incidents included in the database, such as the age of the person, the gender of the person, and suburb where the incident took place. These features were used to give us a better picture of the demographics of these incidents and the people involved. These features were also compared to the findings of the 2009 hoarding study to determine if the demographics of these incidents had changed since the previous study or if they had remained consistent.

Our analysis also examined the characteristics of the identified hoarding fires. This analysis included features of these fires such as the cause of the fire, the estimated structural damage, the presence of smoke alarms, and the containment to the room of origin. The information provided by examining these characteristics will help MFB achieve a better understand of the degree of seriousness of these fires and help MFB personnel have a better idea of what a hoarding fire involves. We compared our analysis of these hoarding fires to the results of the 2009 hoarding study to determine if the characteristics of hoarding fires has changed since the previous study or remained consistent. We also compared our results to data for other residential fire statistics, which helped us to determine whether or not hoarding fires are more serious and more costly to fight than other fires. All of the information determined from the analysis of our database will be used to provide MFB with the most current information about these incidents to help them understand what to expect when responding to these types of incidents, as well as help MFB refine their risk reduction programs for people affected by hoarding, as well as provide them with the most current information on these type of incidents.

Chapter 4: Case Study

During the course of this study, the team was able to examine a hoarding fire on the day it occurred. The fire started in the early hours of the morning in an inner city neighbourhood in Melbourne. En route to the incident, local radio were reporting the fire and attributing the cause to a large accumulation of possessions within the home and that the occupant aged 65+ years had been transported to hospital. This information came via interviews with the MFB Operational Commander responsible for managing the second alarm fire involving 13 MFB appliances and 29 MFB operational firefighters.

On arrival at the scene, the property was identified as the second last in a series of row house attached on both sides described locally as Victorian era workers cottages. Access to these types of houses is more commonly via a front gate and front door. This property and those adjoining it also have rear access through a laneway. MFB trucks and Victoria Police were in attendance and had restricted access to the front of the last three row houses, the side of this end house, and the rear laneway. A building inspector from the local council was present and waiting to inspect the structural integrity of the building with particular attention on the roof due to the damage caused by the fire.

Access

The responding firefighters were able to advise that upon arrival at the house that the roof at the front of the property was fully involved. Access via the front door was not immediately possible due to items accumulated inside the property on the other side of the door. Access for firefighters was gained via the rear laneway and through the neighbouring properties rear yard and that this was gained via the rear laneway through the neighbouring properties yard and knocking down a section of the shared boundary line fence.

Cause

The occupant advised responding firefighters that an electrical fault in a radio/stereo player had started the blaze in the lounge room.

Fire Damage

In the room of origin, the only remains were the brick walls. There was no ceiling plaster or hard plaster on any of the walls. The wooden framework holding up the tin roof was also

significantly damaged by fire and identified by firefighters as potentially structurally unsafe. None of the previous contents of the room were identifiable. All other parts of the home were affected in varying degrees by smoke and/or the fire. The electricity supply connection on the house was blown off during the fire and landed on the nearby nature strip in front of the home.

Hoarding

A large accumulation of possessions was identified throughout the home. Using the clutter image rating scale, this varied from between 4 to 7 and affected hallways, doorways and the actual rooms. Firefighters advised that prior to the fire the house had no connection to gas supplies or the telephone. It was difficult to identify where the occupant would have performed many of the activities of daily living such as cooking, sleeping and personal care. Maintenance of the property appeared to have been an issue for a long period of time. This included the absence of floor boards and floor joists in parts of the home with accumulated items stacked directly onto dirt. In other areas, the safety of the flooring was clearly questionable due to a refrigerator having fallen through it onto the dirt. Despite a thorough inspection of the premises, no toilet or functioning shower was identified.

Post the fire

MFB Community Resilience contacted the Rapid Response Team in Accident and Emergency of the hospital the occupant had been admitted to. This was to recommend a comprehensive assessment of the occupant to address a range of health, safety and wellbeing issues commonly experienced by people affected by hoarding and the evidence that this may also now include squalor due to the maintenance and functional problems in the home prior to the fire. MFB also advised that local council intended to proceed with removal of the roof due to the safety risk, that there was no electricity, gas, telephone, toilet or shower and that due to the damage caused by the fire alone, significant rebuilding would be required.

Community Resilience was advised that the occupant had previously been referred for assessment by the regional Aged Care Assessment Team (ACAT) following a complaint regarding the property and concerns for the occupant. The occupant had refused this assessment. The following day, MFB was informed the occupant was released from hospital earlier in the day with the support of a local priest who was going to assist her to identify and secure crisis accommodation.

Chapter 5: Results and Analysis

In 2009, MFB in conjunction with WPI completed a world first study specifically on the fire risks involved in hoarding. This study was limited in scope, as it only examined fires. In many cases firefighters would visit a hoarding property outside of a fire setting including EMR and non-emergency incidents. MFB commissioned a new study to expand the scope of data collected, identify how the reporting rate has changed over the past 3 years, and re-evaluate previously collected data. This new data is compared to the 2009 and normal residential fire data whenever possible. In any area where appropriate, data only relating to fires will be separated out and analyzed separately.

5.1 Hoarding Fires

Unlike fires in other homes, hoarding fires by their very nature and volume of what is stored in and around these homes result in an abnormally high fuel load leading to greater potential of more significant fire. Our study examined a total of 60 hoarding fires that occurred between 3 April, 2009 and 3 April, 2012. Using several formal and informal methods of data collection, we determined several characteristics which describe the severity of these events. We compared these characteristics with other residential fires and with the hoarding fires examined in the 2009 hoarding study.

5.1.1 Cause of Fire

The cause for all hoarding related fires is shown in Figure 1. We deduced the cause of most of the hoarding fires we examined were from AIRS descriptions or incident comments. Electrical fires were the leading cause of all our determined causes of fire with 23% of our total. Although not as common as electrical fires, cooking and heat/open flame fires accounted for 18% of our hoarding fires. Smoking accounted for another 17% of the hoarding fires. The category "Other" represents instances of suspicious causes and consists of 12% of the causes for these hoarding fires. Seven of the sixty fires consisted of an undetermined cause.
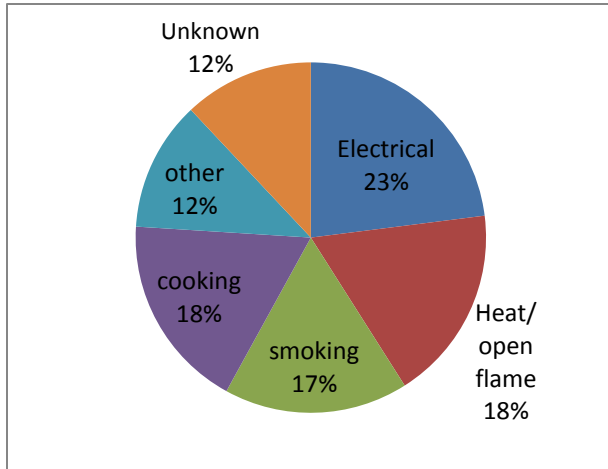
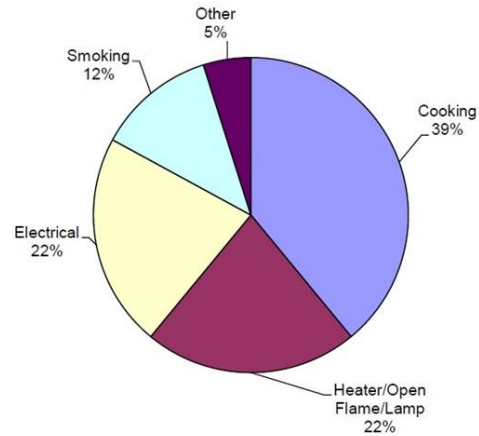**Figure 1: Causes of Hoarding Fires**

Figure 2: Causes of Hoarding Fires (Lucini et. al., 2009)

When our results are compared to the results of the 2009 hoarding study in Figure 2, a large decrease in the number of cooking fires is indicated. Fires ignited by cooking were no longer the leading cause although still represent a great portion of the cause of hoarding fires. Electrical fires are the most common amongst our data. The limitations of our data consist of the overlap from many of these causes. For example, there can be instances where a person was cooking but a fire started due to an electrical malfunction in an appliance used for cooking. Many of these causes described in the AIRS reports are based on the judgment of the firefighter and various firefighters can label it differently. In the example above, some may label the instance as an electrical fire while others as a cooking fire.

Figure 3 demonstrates an analysis of the causes for electrical fires. These electrical fires have been subcategorized into several instances. The most common factor is an electrical overload with 57% of the electrical fires. These electrical overloads generally occur from a large number of electrical appliances being connected to a single or a series of powerboards. These electrical overloads significantly increases the risk of fire as is shown in our data. Other subcategories for electrical fires include misused/defective appliances. This subcategory consists of 22% of electrical fires and describes instances where a certain appliance is misused by the person or the appliance itself is defective. Unlike an electrical overload which is attributed to an electrical system, this subcategory describes only the singular appliance. Events involving lack of maintenance for the cause of electrical fires was due to the person not maintaining his or her

appliances in proper and good working conditions. The remaining instances did not consist of a determined electric factor.
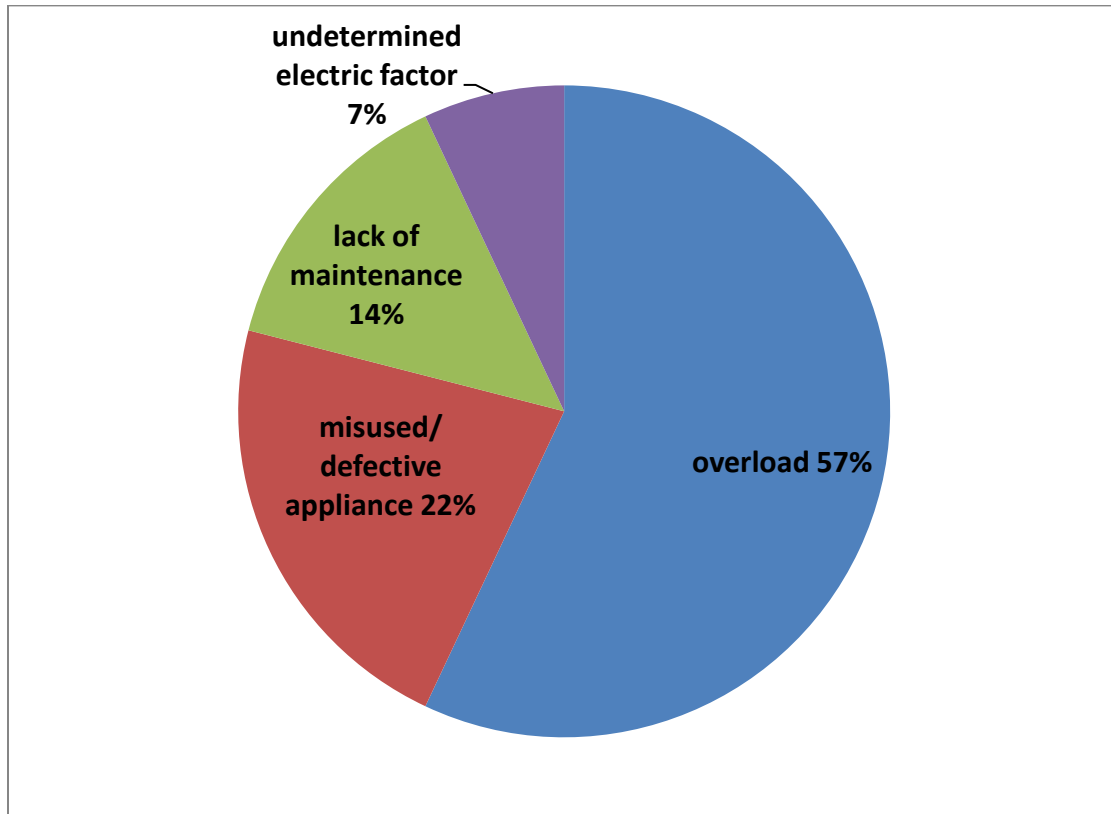

Figure 3: Causes for All Electrical Hoarding Fires

Our data clearly demonstrates a great amount of fires being ignited from electrical overloads as these are known to cause risk in any residential household. The risks from electrical overloads greatly increases for hoarding households not only due to the excessive fire load but because people affected by hoarding tend to use ad hoc arrangements for their appliances and electrical systems.

Figure 4 shows the distribution for all heating/open flame fires. The largest cause for heating/open flame fires was from leaving combustibles near heating units and sources as well as careless misuse of appliances. Each of these subcategories consists of 37% of heat/open flame fires. These both emphasize the risk of hoarding as having combustibles near heating units is dangerous due to the build-up of items leads to an excessive fuel load. These households were more likely to have misused appliances leading to unsafe practices for powering them such as the use of multiple double adaptors and power boards. The rest of the distribution consists of

appliance malfunction as well as a gas leak. These both accounted for 9% of heat/open flame fires.
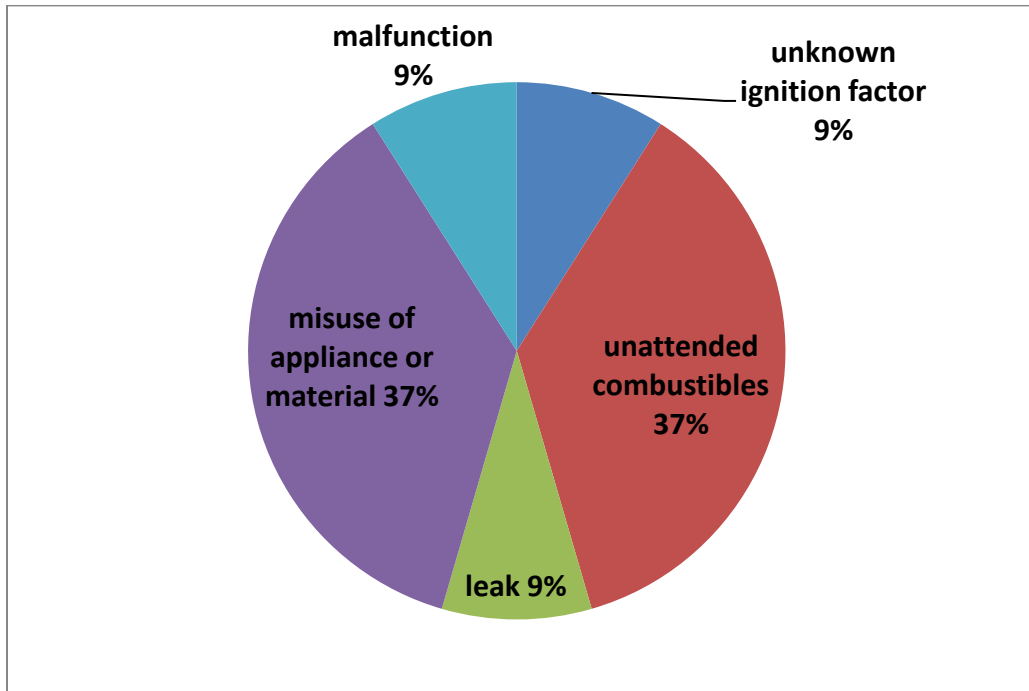
Figure 4: Causes of All Heating/Open Flame Hoarding Fires

The distribution of subcategories for cooking fires is shown in Figure 5. The largest factor for cooking fires was unattended cooking with an overwhelming 64%. Many of these instances consisted of leaving a pot or other foodstuffs on a stove resulting in a fire. While unattended cooking was a key cause of fires in other homes, the risk of this behaviour was compounded by the high fuel load on and around bench tops, stoves and cooking appliances. There were also instances of occupants failing to clean their appliances and were not in proper working conditions and accounted for 9% of these fires. In 9% of these events, the appliance itself malfunctioned leading to a fire. Similar to heating/open flame fires, we found an instance of an occupant cooking near combustibles. Again, cooking near combustibles poses severe fire risks as cooking should never be done near combustibles.
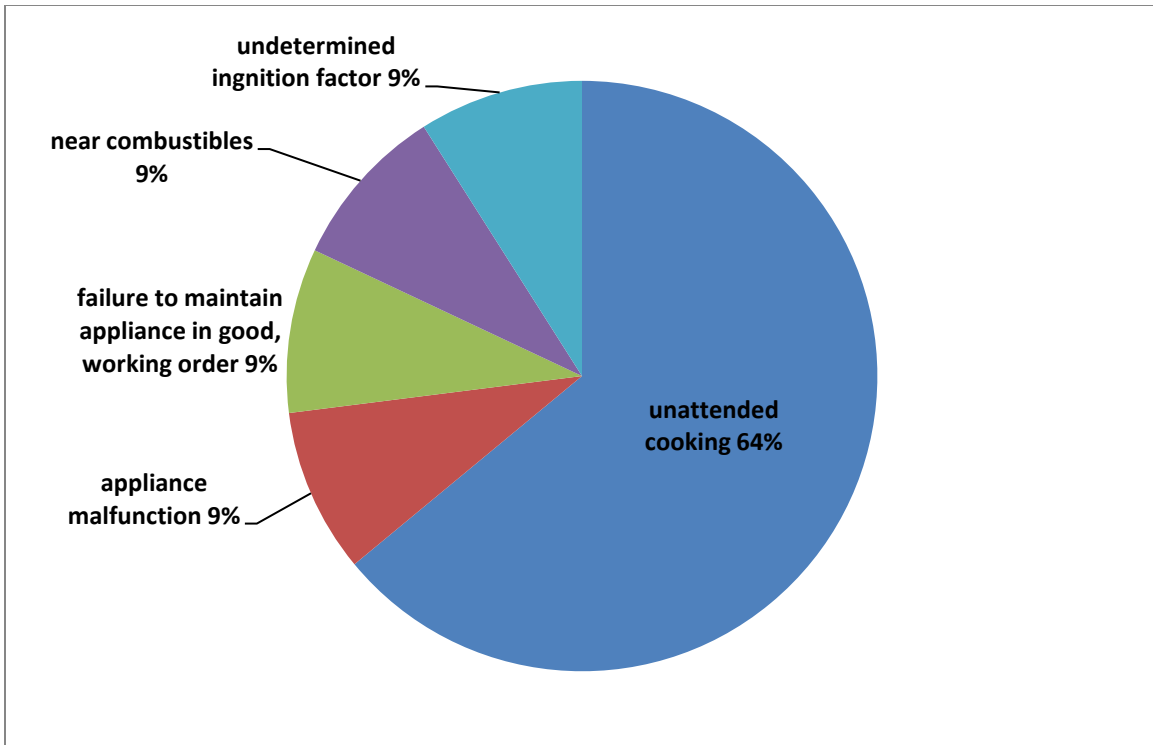
Figure 5: Causes of all Cooking Hoarding Fires

5.1.2 Point of Origin

We examined the point of origin of hoarding fires to determine where these fires typically occur. Figure 6 below clearly displays the number of fires occurring at given points of origin.
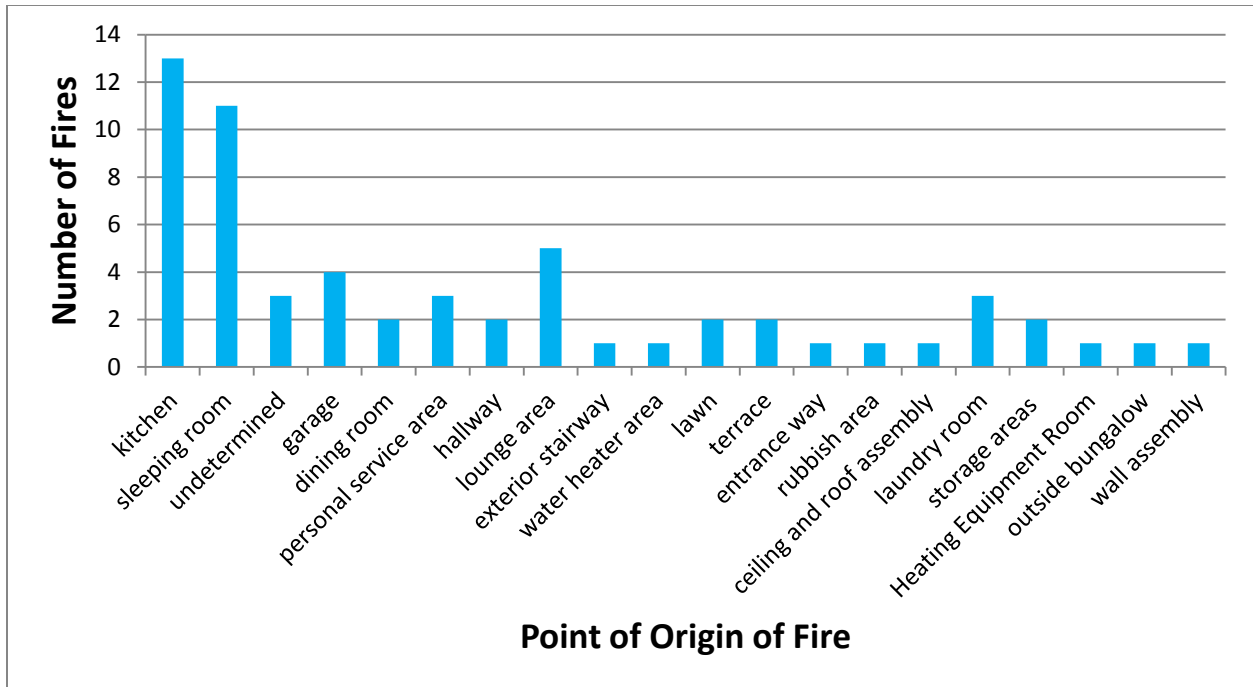
Figure 6: Point of Origin for Hoarding Fires

The kitchen and the bedroom are the most common points of origin. This graph reveals that most hoarding related fires occurred in areas of daily living or appliance use. Approximately 44.3% of average residential fires began in the kitchen or cooking area with 8.8% of these fires beginning in the bedroom. These numbers drastically change for those affected by hoarding as about 21.7% of hoarding fires began in the kitchen or cooking area and 18.3% began in the sleeping room. Although kitchen and sleeping room were the two most common areas for both hoarding and average residential fires, there is large discrepancy between these two. Some plausible explanations for this discrepancy may include cooking less than the average household, cooking in different areas other than the kitchen, or the use of different methods for cooking such as greater usage of a microwave instead of a stove. Some of our data may support these explanations as about 19% of cooking fires did not begin in the kitchen and occurred in areas such as the sleeping room and terrace.

5.1.3 Smoke Alarms

Figure 7 demonstrates the presence of smoke alarms for all hoarding households involved in a fire. Our results indicate 52% of these households contained a smoke alarm with 37% not present and 11% undetermined.
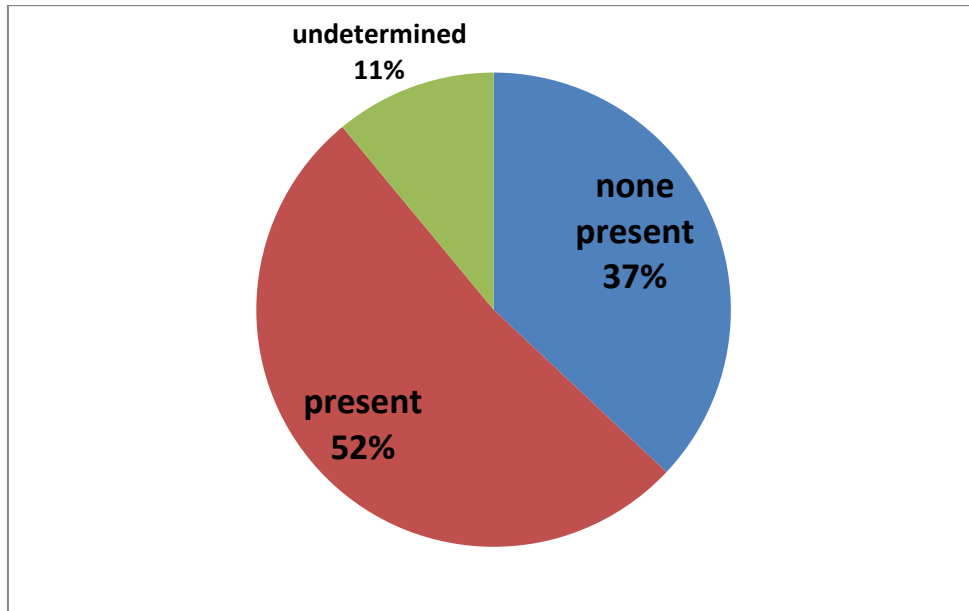
Figure 7: Presence of Smoke Alarms in All Hoarding Events

The 2009 hoarding study found that 40% of hoarding households involved in a fire contained a smoke alarm and 60% did not contain a smoke alarm. The present smoke alarms were further subdivided as 26% operational, 12% malfunctioning and 2% out of range. These percentages are demonstrated in Figure 8 below.
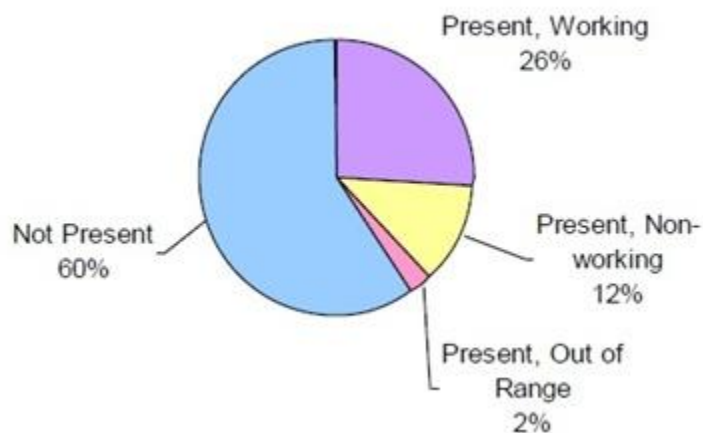

Figure 8: Smoke Alarm Status in 2009 Hoarding Study (Lucini et al, 2009)

Our results as shown in figure 7 demonstrate a larger percentage of hoarding households with a smoke alarm. The average number of total properties involved in a fire with a functional smoke alarm was 75.5% whereas only 52% of hoarding households were found with a smoke alarm present. We found that 38% of all hoarding households contained a smoke alarm which operated during a fire with another 12% containing smoke alarms which were out of range of fires.

Figure 9 shows a further subdivision of households with smoke alarms by whether the smoke alarms operated, malfunctioned, or were out of the range.
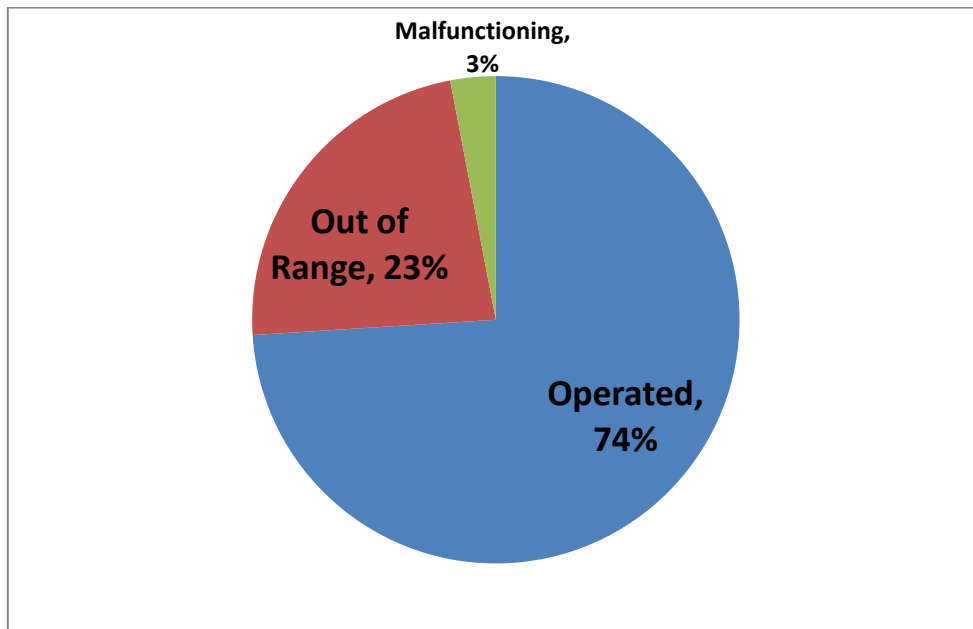
Figure 9: Status of Present Smoke Alarms in All Hoarding Events

Of these cases, 74% of hoarding households with a smoke alarm contained one which operated properly. The percentage of all hoarding households involved in fire to contain a functional smoke alarm was 38% which is greater than the percentage of operational smoke alarms found in the 2009 study. Our results also demonstrate a greater percentage of smoke alarms out of the range of the fire as well as a decrease in the percentage of malfunctioning smoke alarms.

5.1.4 Alarm Level and Number of Total Appliances

There are many different alarm levels for structure fires. These different categories for alarms generally represent the amount of firefighting appliances and personnel needed to combat

a fire. These alarm levels typically represent the strength of fire with First Alarm being the lowest level and increasing with subsequent alarm levels. None of the hoarding fires we investigated were Fourth Alarm or higher fires as these are more typical for factories or high rises. First Alarm fires accounted for 65% of the hoarding fires we examined. First Alarm fires always send at least two pumpers with one to six total appliances having some involvement to a given fire. Second Alarm Fires accounted for 30% of the hoarding fires we investigated and in these instances about six to seventeen total appliances including four to six pumpers were sent to attend a fire. There were three instances of Third Alarm fires which accounted for 5% of the fires we investigated. These instances required between fifteen to thirty total appliances including seven and eleven pumpers to attend the scene.
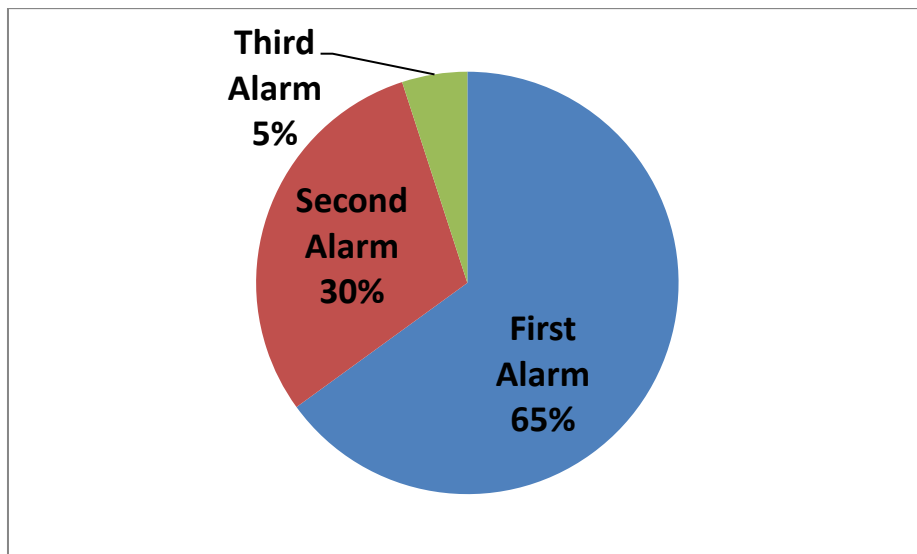
Figure 10: Alarm Level for MFB Operations

Figure 11 displays a histogram revealing the number of total MFB Appliances attending a hoarding fire. The total number of appliances includes pumpers, aerials, special vehicles and other vehicles such as pods and fire investigation units. The average number was 6.5 appliances with a median number of 3.5 MFB appliances and a maximum number of 30 MFB appliances. Our results also indicate that 40% of all hoarding fires required only two or less MFB Appliances to attend the scene.
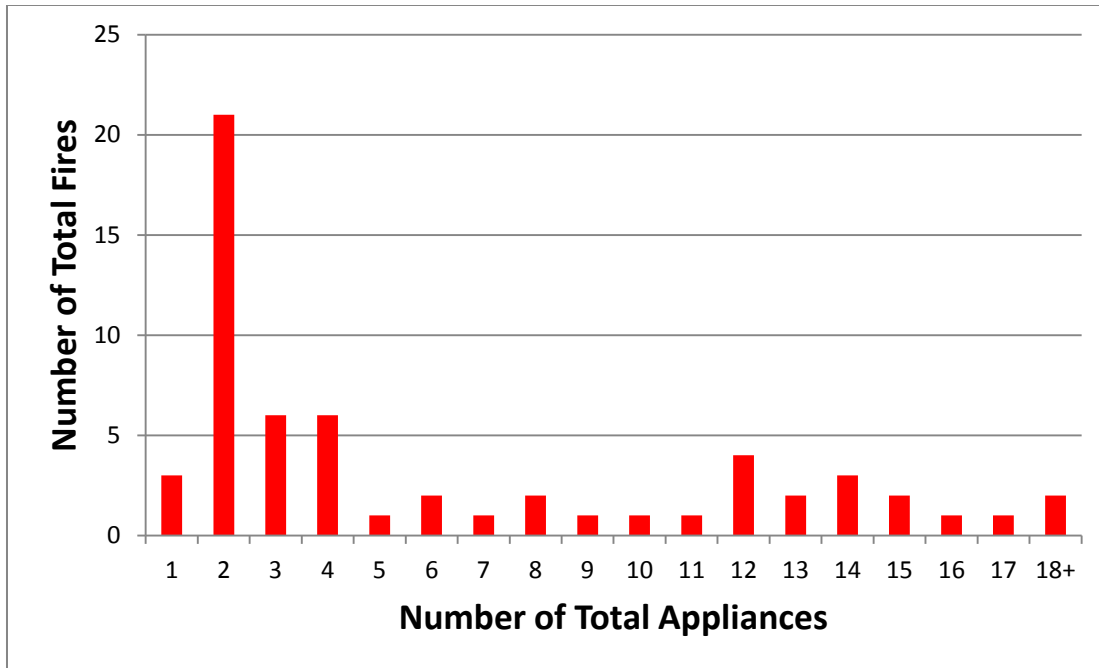
Figure 11: Number of MFB Appliances attending a Hoarding Fire

Some of these instances may appear as anomalies but are not as these numbers represent the total amount of appliances for the full duration of the fire and not the peak amount of appliances at a given time. For example, there was a First Alarm fire requiring eleven appliances and two Second Alarm fires requiring sixteen and seventeen appliances. Although these alarm statuses generally represent strength of fire, these anomalies represent both the strength of fire as well as the duration of the fire. The amount of clutter in hoarding households may increase the duration of these fires lasting through several shifts causing some pumpers and personnel to leave the scene with others replacing them. Although there may be a similar amount of appliances between shift changes, the new appliances are added to the total amount despite the similar ratio of appliances on scene. Due to these shift changes, some of our instances may have seemed to be an anomaly for a First or Second Alarm while they actually were not.

5.1.5 Number of MFB Operational Personnel Attending a Hoarding Fire

Figure 12 displays a histogram detailing the number of MFB Personnel attending a fire. We found that the average number of MFB personnel attending a hoarding fire is 18.3 personnel with a median number of 11 personnel. Along with the average and median, the maximum number of MFB personnel present for these hoarding fires was 68 personnel. The average number of MFB personnel on scene for an average residential fire is between 7 and 8 personnel

with two appliances. Our results demonstrate a large increase in the number of personnel required for these hoarding fires. On average, these hoarding fires require 2.6 times the average number of MFB personnel at an ordinary residential fire.
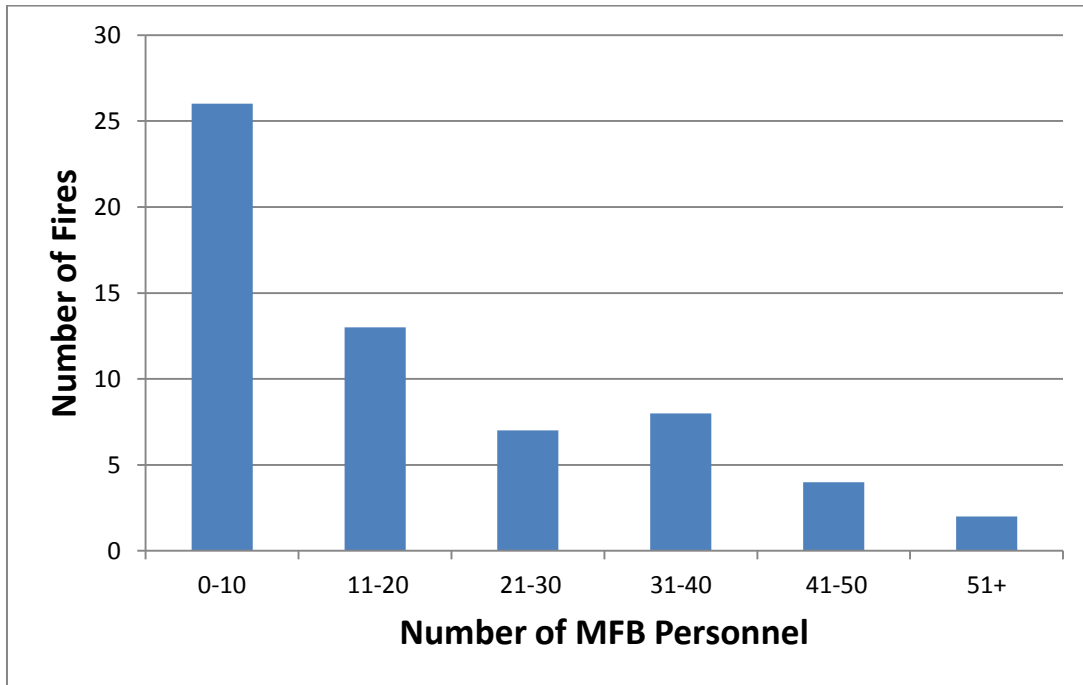

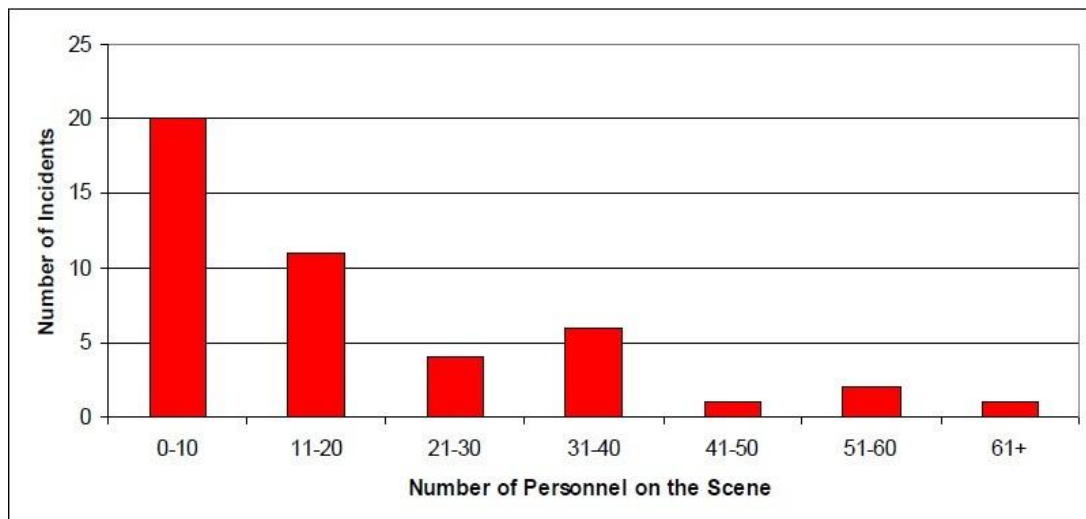**Figure 12: Number of MFB Operational Personnel attending Hoarding Fires**

Figure 13: Number of MFB Operational Personnel in 2009 hoarding study (Lucini et al, 2009)

When our results are compared to the 2009 hoarding study as shown in Figure 13, our results demonstrate an increase in the average number of personnel attending these in comparison. The 2009 hoarding study found the average number of MFB personnel attending a

hoarding fire was 17.3 personnel. Our average was found to be 18.3 MFB personnel on scene. Although only a small increase, both results clearly indicate the greater amount of MFB personnel needed to tackle a hoarding fire. Their results indicate 42% of these fires required fewer than ten personnel while our results demonstrate 43% of hoarding fires only required ten or fewer MFB personnel.

5.1.6 Number of MFB Pumpers Attending a Hoarding Fire

A histogram of the number of pumpers used to combat a hoarding fire is shown in Figure 14. The average number of pumpers attending a hoarding fire is 3.25 pumpers with a median value of 2 and a maximum number of 11 pumpers. This average reveals that hoarding fires require on average 1.6 times the number of pumpers for an average residential fire. Thirty-three hoarding fires required only two or less pumpers on scene and accounted for 55% of all of the fires we examined. There were two fires requiring more than seven pumpers and accounted for 3% of all our hoarding fires.
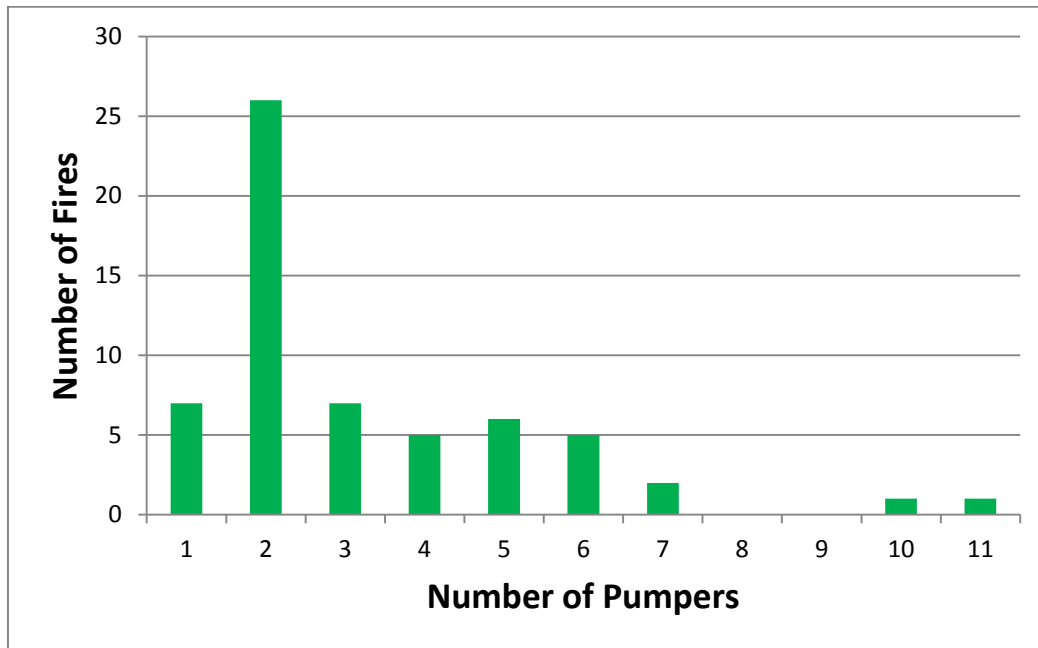
Figure 14: Number of Pumpers Attending a Hoarding Fire
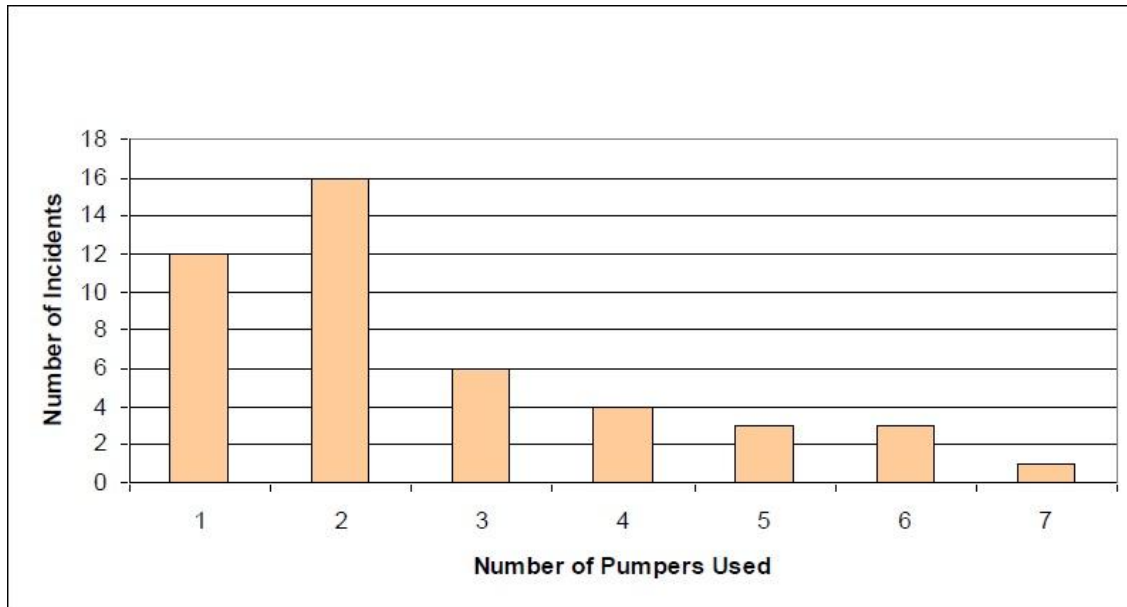
Figure 15: Number of Pumpers Attending a Hoarding Fire in 2009 hoarding study (Lucini et al, 2009)

The histogram shown in Figure 15 demonstrates the results found in the 2009 hoarding study. Their average for MFB pumpers attending a fire was 2.6 leading to our hoarding fires using 1.25 times the amount of pumpers their average revealed. The 2009 hoarding study also demonstrated that a hoarding fire required only two or less pumpers for 62% of cases. This percentage dropped to 55% in our results. Our results also indicate two fires requiring more than seven pumpers to attend the fire while their maximum for all fires was seven pumpers. The increase in the number of appliances, pumpers, and personnel may be due to health and safety requirements needing more firefighting appliances and personnel to attend fires due to the protracted nature of the fire event.

5.1.7 Utilities and Services Called During a Fire
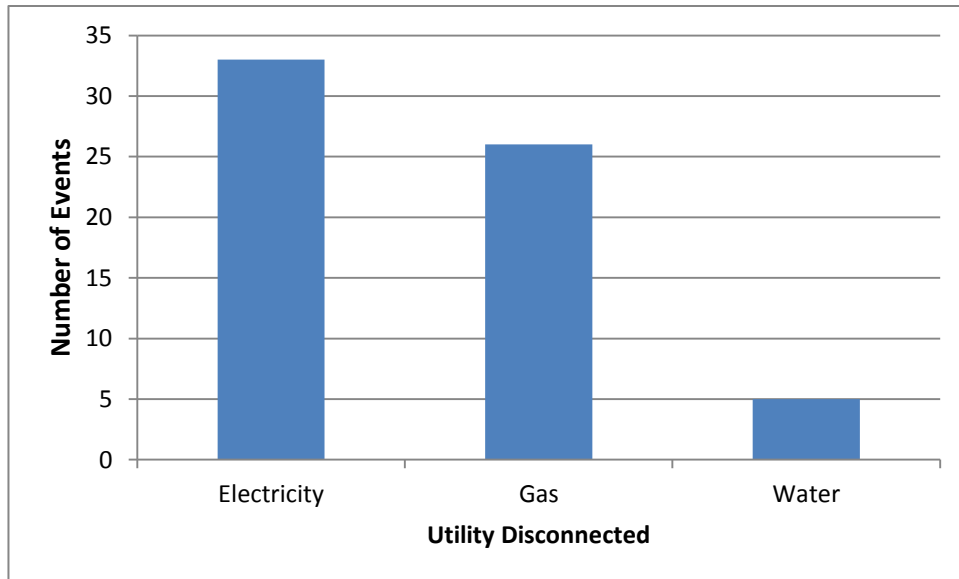
Figure 16: Number of utilities called during hoarding fires

While fighting a fire, the brigade will frequently call for one or more utilities to be disconnected. These actions are taken for the safety of the firefighters or to remove a hazard. In 35 events involving fire, one or more utility was disconnected. The most common disconnected utility was electricity in 33 cases followed by gas in 26 cases. Water was disabled in 5 cases. When the water is disconnected, it usually indicates that a pipe was broken during the fire. Electricity and gas are disconnected because they are either the cause of the fire or could make it more severe.

Shutting off a utility removes an immediate hazard during the fire and ensures that this utility is checked and/or repaired by an appropriately qualified person before being reconnected so that it can be utilized safely. Contacting the appropriate service to repair and reconnect the utility is the resident's responsibility. The results of this study consistently demonstrate that people affected by hoarding use appliances and utilities in an unorthodox or ad hoc way. Due to the accumulated items in hoarding homes, the repairs are difficult to envisage due to access and the occupational health and safety requirements utility agencies and private providers must provide for their employees. There is also the possibility of people affected by hoarding not wanting any outside help to repair their utilities. Based on these issues, the occupant may just adapt to the situation after the event and place themselves at higher risk through the strategies they use to perform daily functions such as preparing food or obtaining heating without utilities.

This information presents a strong case that the occupants of homes identified through MFB emergency response in which utilities have been disconnected and are referred for assessment should be prioritised due to their increased risk in the future.
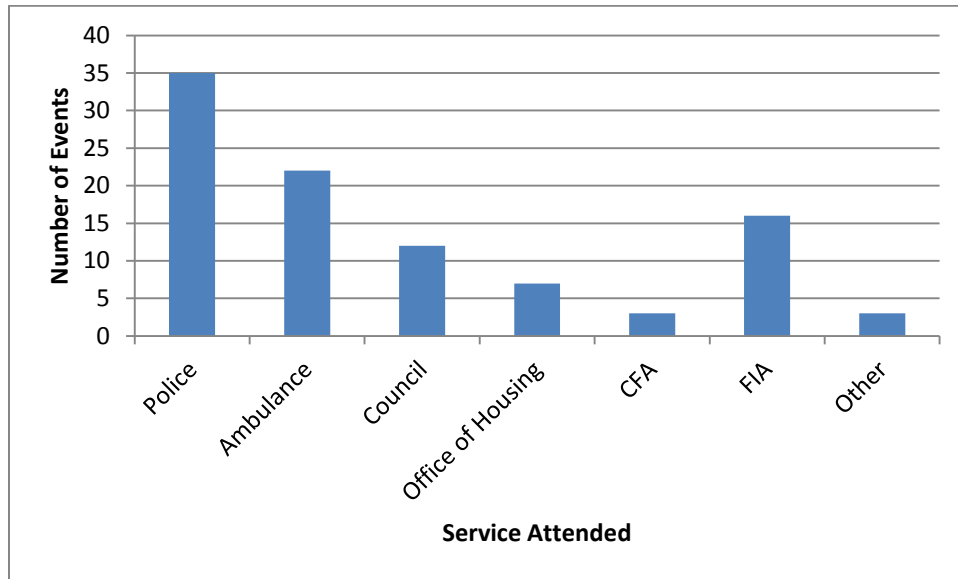

Figure 17: Services Attended During Hoarding Fires

Other public services occasionally will also attend a fire. In 33 of the 60 fires, another service was called and this distribution of services is represented in Figure 17. The most common service called was police in 35 cases. There are many possible reasons for having police attend a fire including cases requiring forced entry, aggressive behaviour from the occupant, a fatality is found, or a fire requiring traffic control due to the large amount of appliances. Any fire that is thought to be suspicious is also investigated by the police. Ambulances were the second most common service, attending in 22 cases.

Government representatives in the form of local council or public housing attended in 12 and 7 cases respectively. In normal fires, a council building inspector might be called to assess damage and determine if the building is still habitable. In some of these situations the local government building inspector may make an internal referral and engage the aged and disability services department within their own organisation. The other government representatives are usually from the Office of Housing, DHS who respond when an incident of significance occurs at one of their properties.

Additional fire resources that were utilized in hoarding fires were CFA personnel and fire investigation (FIA). All of the hoarding fires discussed occurred within the MFD where MFB has jurisdiction, however for larger fires occurring on the border of the MFD additional CFA appliances may be requested to assist. We observed that CFA assisted in 3 instances. FIA attends a fire when the cause cannot be determined or when there is a fatality. Usually, the cause cannot be determined when a fire is so severe there is very little evidence left of what caused ignition. In 16 instances or 27% of the hoarding fires recorded, an FIA investigation was performed.

5.1.8 Containment of Fire

Figure 18 demonstrates the analysis of the containment of fire for the hoarding fires examined. We found that 60% of hoarding fires were contained to the room of origin. The percentage has increased from the 2009 hoarding study as their results found that 40% of the hoarding fires they investigated were contained to the room of origin. However, an average residential fire was contained to the room of origin in 82% of structure fires. Despite the higher percentage in comparison to the results of the 2009 hoarding study, containing the fire to the room of origin is still more difficult in comparison to the average residential fire. There were only three instances where the fire spread beyond the structure of origin and accounted for 5% of hoarding fires. We found that 33% of hoarding fires were contained to the structure of origin but not within the room of origin. Our results still demonstrate great difficulty for firefighters to contain a hoarding fire to the room of origin. This is due to several factors such as the excessive fuel load within these structures leading to a greater chance of spread and the difficulty accessing the seat of fire.
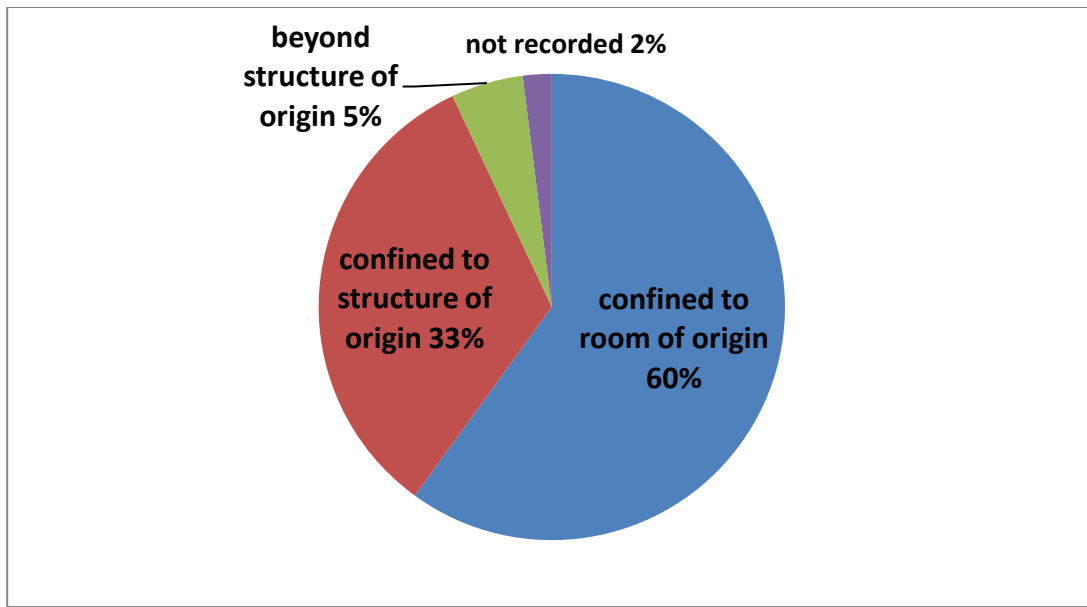
Figure 18: Containment of Hoarding Fires

When comparing the containment of fire to whether a smoke alarm is present, there were an overwhelming number of fires contained to room of origin with a smoke alarm present. Figure 19 reveals the comparison between fires contained to the room of origin and the presence of a smoke alarm. We found that 65% of fires confined to the room of origin also contained a smoke alarm. We also found that 29% of fires contained to room of origin did not present a smoke alarm with another 6% of fires with an undetermined status for smoke alarms. Although in many of these instances, the smoke alarm was out of range of the fire. These numbers drastically change when the fire spread beyond the room of origin.
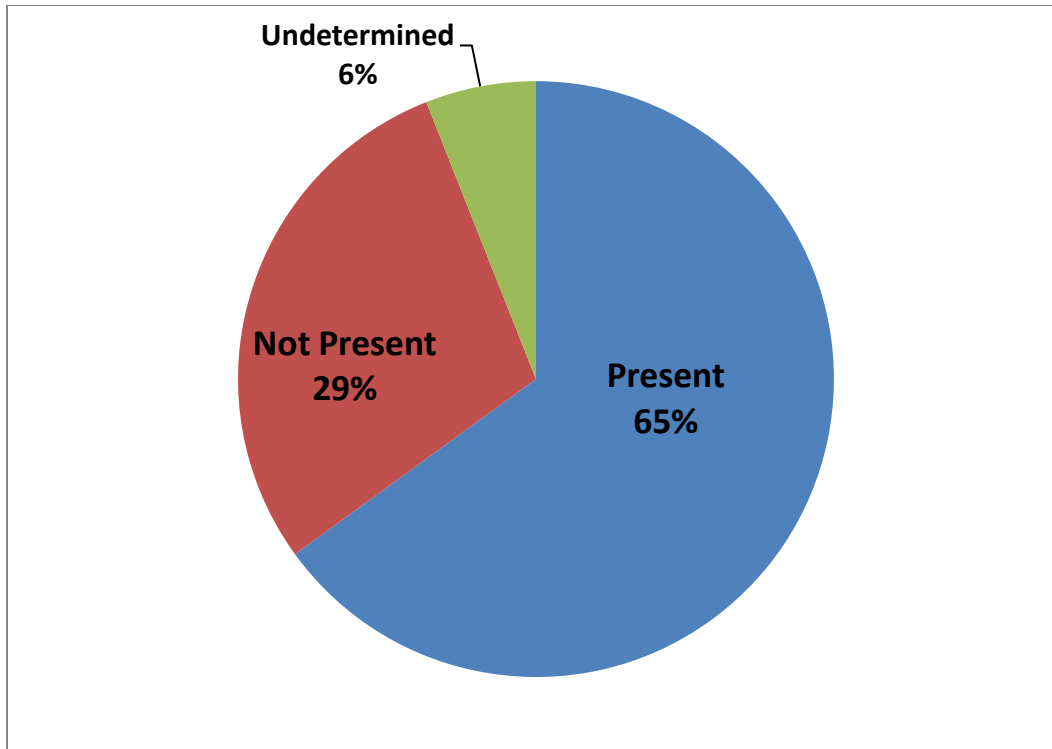
Figure 19: Presence of Smoke Alarms in Fires Contained to Room of Origin

A pie chart showing the comparison between the presence of smoke alarms and fires spreading beyond the room of origin is shown in Figure 20. We found a greater percentage of fires with an undetermined status of smoke alarms as well as instances without a smoke alarm present when the fire spread beyond the room of origin. We found that 50% of fires spreading beyond the room of origin had no smoke alarm present. This percentage is much greater than the percentage of fires contained to room of origin with no smoke alarms. The percentage of fires spreading beyond the room of room of origin with a smoke alarm present also significantly drops as the percentage was found to be 29%. This percentage significantly contrasts the 65% of fires contained to the room of origin with a smoke alarm present.
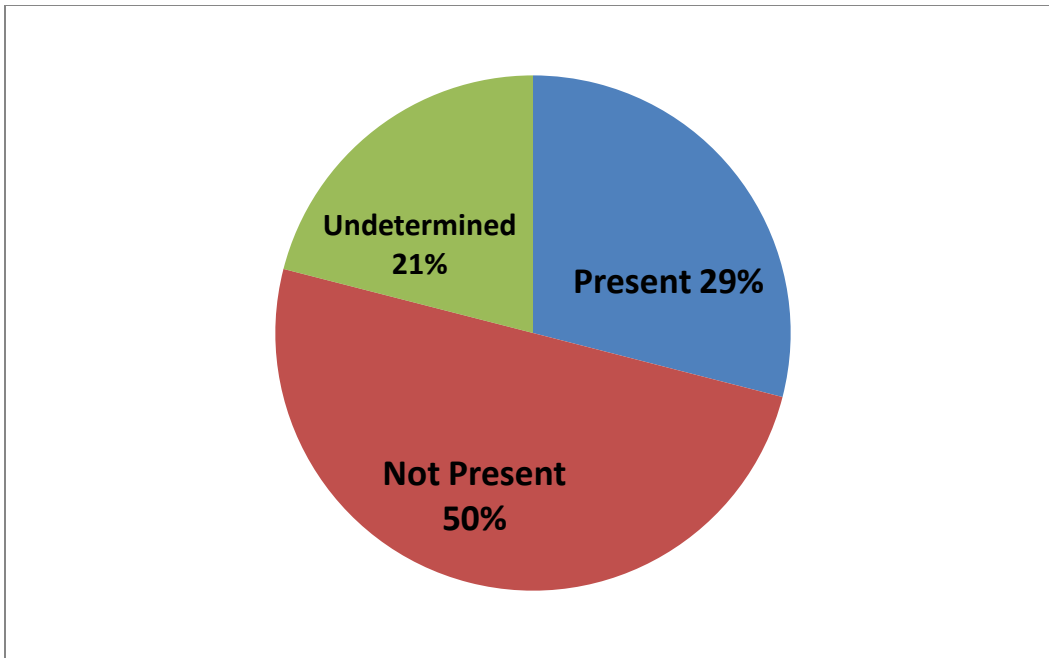
Figure 20: Presence of Smoke Alarms in Fires Spreading Beyond Room of Origin

We further subdivided the category of fires spreading beyond the room of origin to two instances. These instances included fires contained to structure of origin as well as fires spreading beyond structure of origin. These pie charts are found in Figures 21 and 22. We investigated the twenty cases where the fire had spread beyond the room of origin but was contained to the structure of origin. We found that 48% of these fires we investigated reported no smoke alarm present within the structure. There were another 19% undetermined instances and only 33% of these fires were found with a smoke alarm present.
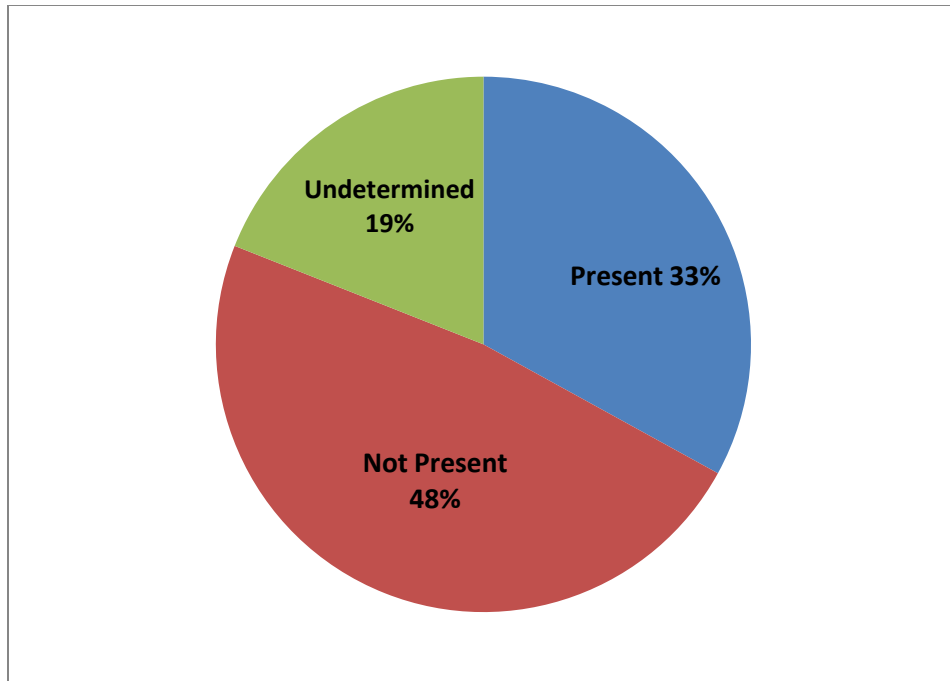
Figure 21: Presence of Smoke Alarms in Fires Contained to Structure of Origin
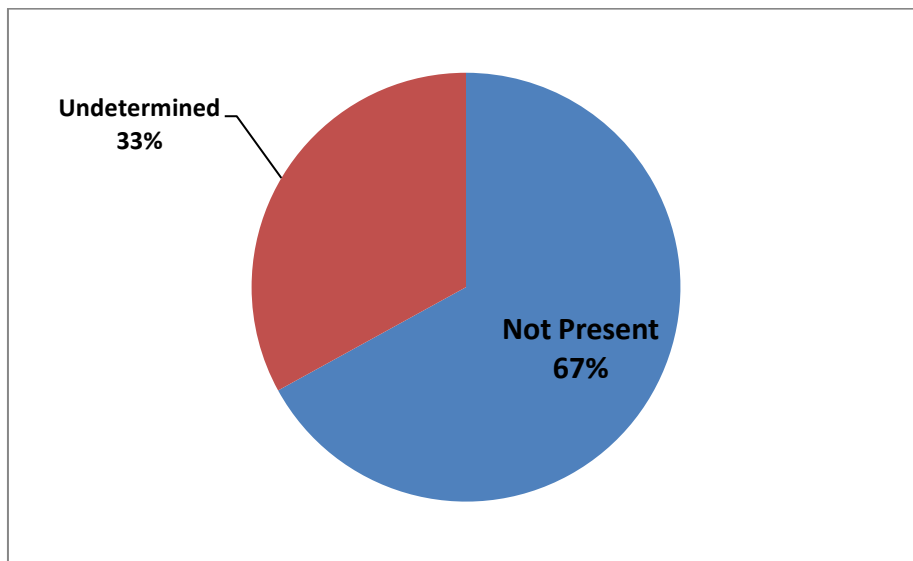
Figure 22: Presence of Smoke Alarms for Fires Spreading Beyond Structure of Origin

Although there was a small sample size of three fires spreading beyond the structure of origin, we found that two of these fires presented no smoke alarm. The third fire presented an undetermined status in regards to smoke alarms. These numbers support the risk reduction advice given by firefighters to install smoke alarms within structures. There is a large difference of hoarding fires contained to the room of origin with a smoke alarm present versus hoarding fires spreading beyond the room of origin with a smoke alarm present.

5.1.9 Estimated Structural Loss (AUD$)

Figure 23 shows a histogram revealing the estimated structural damage for the hoarding fires we examined. Fifty-one fires had an estimated structural loss leaving nine instances unknown. We found that 78% of the fifty-one fires had an estimated structural loss of $100,000 or less. The average estimated structural loss was found to be $85,737.25 with a median value of $15,000 and a maximum of $600,000. The average estimated structural loss in an ordinary residential fire is $19,150 which only account for 22% of the estimated structural loss for an average hoarding fire. Our average and median numbers may also be subject to change as these estimated structural losses were conservative estimates. In one instance, the estimated structural loss was reported to be $5,000 yet the property needed to be demolished after the fire. An estimated structural loss over $300,000 was more appropriate and a better measure of the damage caused by the fire.
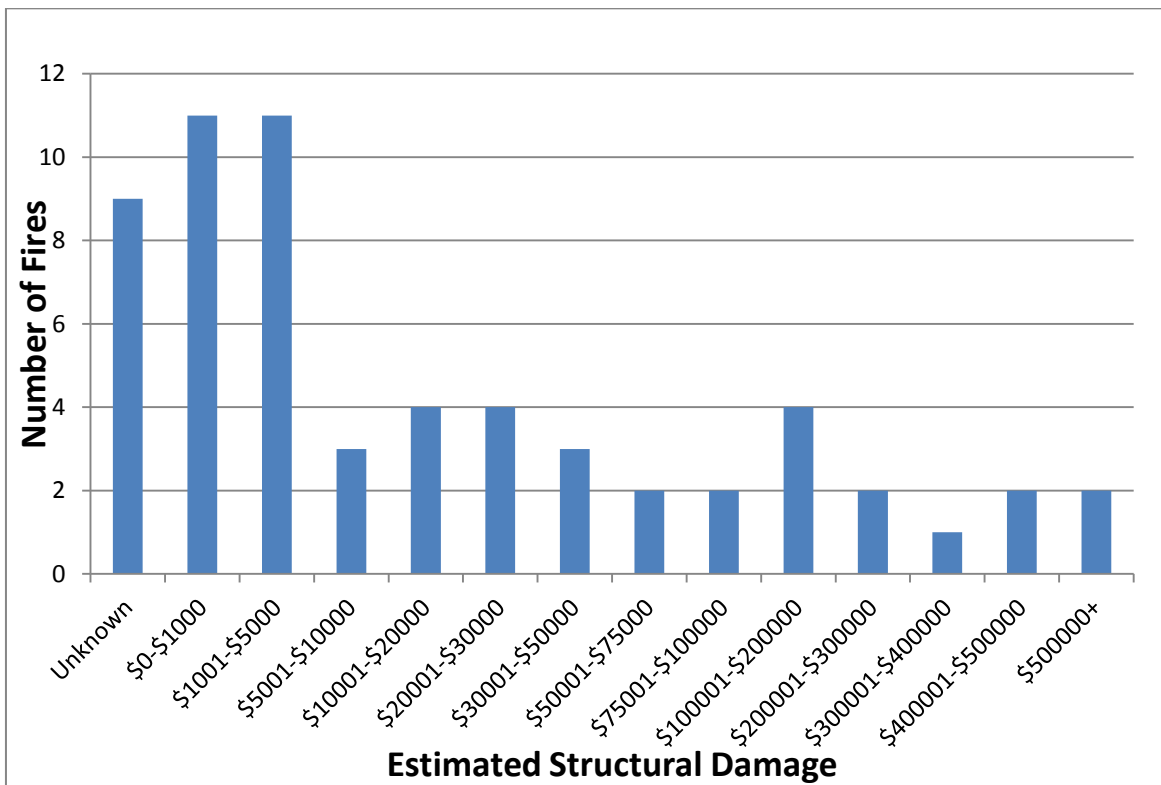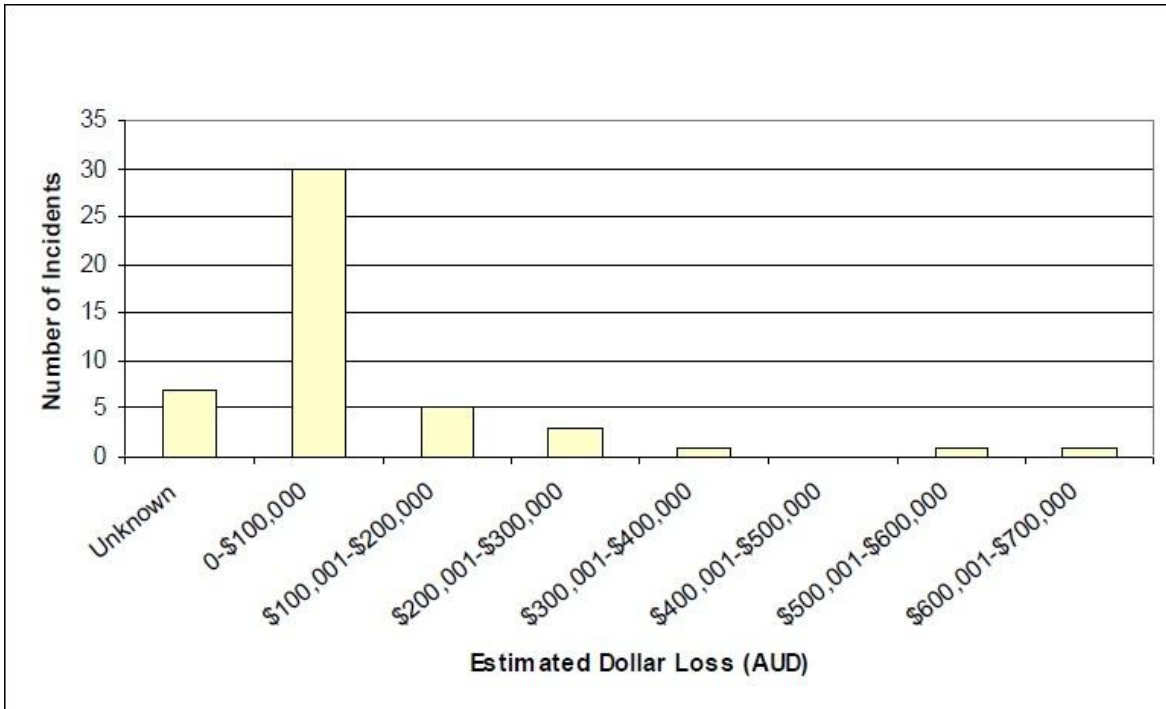

Figure 23: Estimated Structual Damage (AUD$)

Figure 24: Estimated Dollar Loss in 2009 hoarding study (Lucini et al, 2009)
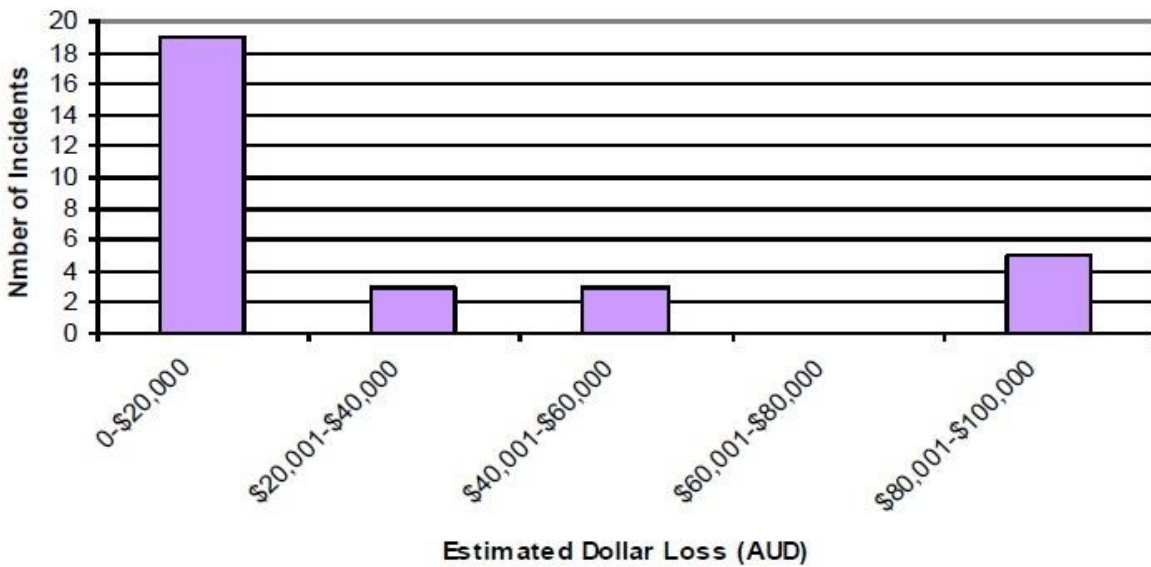

Figure 25: Estimated Dollar Loss within $100,000 in 2009 hoarding study (Lucini et al, 2009)

Figures 24 and 25 demonstrate the results of the 2009 hoarding study in regards to estimated dollar loss (AUD) by hoarding fires. Figure 24 gives a distribution in $100,000 intervals with Figure 25 giving a further focus on fires between $0 and $100,000 worth of

estimated structural loss. The 2009 hoarding study found that 73% of hoarding fires they investigated had $100,000 or less worth of estimated dollar loss which is similar to the 78% our study indicates. Their average estimated structural loss was about $100,100 which is greater than the average estimated dollar loss of $85,737.25 found in our results. The average dollar loss the 2009 hoarding study found accounts for 117% of the average dollar loss our results demonstrate.

The most plausible reason for the drop in estimated structural loss is the greater containment of fires to the room of origin. The greater containment of fires may be attributed to a greater compliance of smoke alarms within hoarding households. Another plausible factor for the greater containment of fire may be leading to the increase in number of personnel and appliances attending a fire due to recent health and safety requirements. We found a greater percentage of fires contained to the room of origin to have a smoke alarm present in contrast to fires spreading beyond the room of origin. These reasons all demonstrate a plausible connection for the drop in average estimated structural damage compared to the average found in the 2009 hoarding study.

5.2 Demographics of Fire

Community safety engagement activities and treatments are developed through research and analysis of not just the causes of the fire but victim demography in all incidents, injuries and fatalities. This analysis provides vital information which underpins core activities by fire services worldwide to target those most at risk. Research about people affected by hoarding and/or squalor is increasing but the identification of those most at risk within this cohort is limited. Victim demography is crucial to the development of a better understanding to risk.

5.2.1 Gender

Gender was a difficult category to locate throughout the events. In cases where the people affected by hoarding could be identified, we found 53% were males and 47% were females. Figure 26 indicates this distinction.
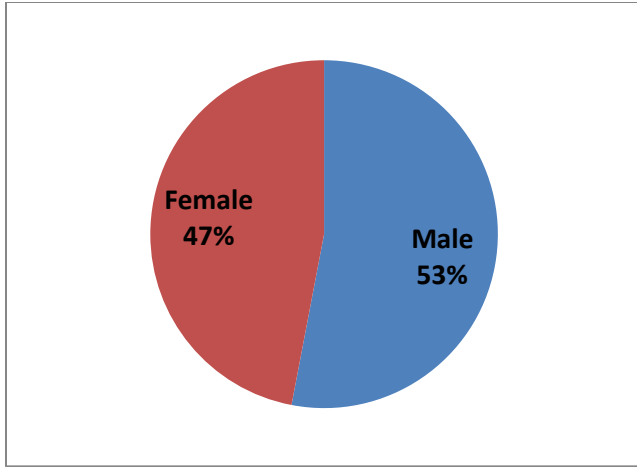
Figure 26: Gender Involved in Hoarding Fires
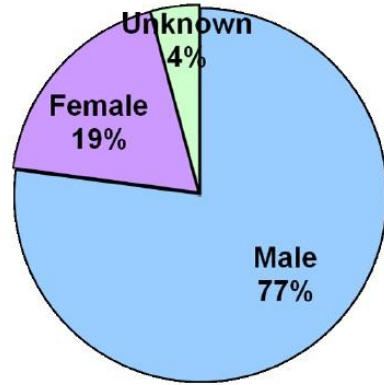

Figure 27: Gender of Hoarding Fire Occupants in 2009 Hoarding Study (Lucini et al, 2009)

When comparing our findings to those from the 2009 hoarding study, our study indicates a large increase in percentage of identified females. Figure 27 reveals the gender distribution found in the 2009 hoarding study. Their analysis demonstrates an overwhelming majority of males affected by compulsive hoarding with a much smaller percentage of females. Our results are more consistent with international findings of a similar number of affected people amongst males and females.

5.2.2 Age

Figure 28 represents a pie chart of the identified age group of people affected by hoarding in fires. The overwhelming majority of people affected by hoarding were aged 65+.
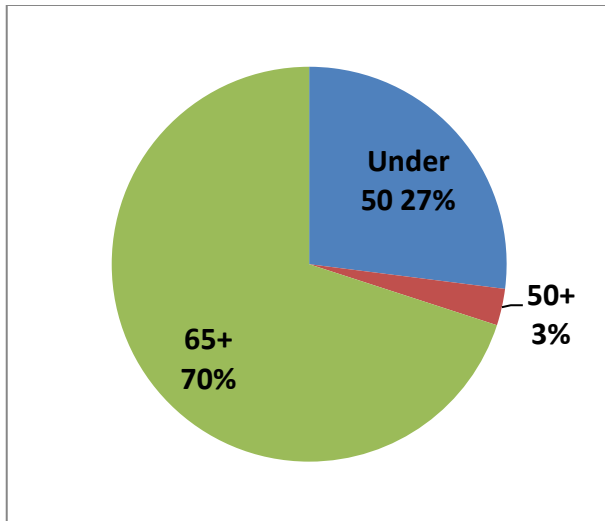
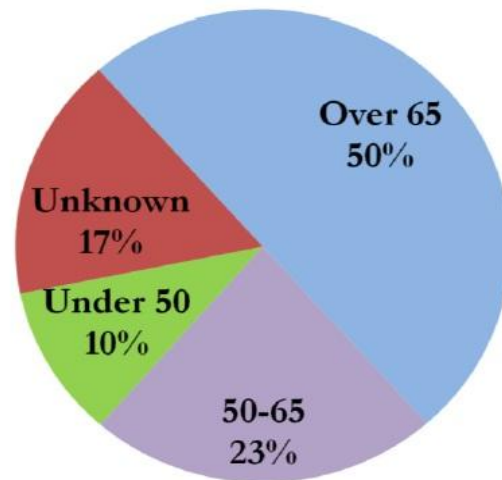**Figure 28: Age of Hoarding Fire Victims**

Figure 29: Ages of Hoarding Fire Victims in 2009 Hoarding Study (Lucini et al, 2009)

When comparing our results of the age groups of affected people involved in fires to the results of the 2009 hoarding study, there is a large difference between all age groups. Figure 29 displays the results found in the 2009 hoarding study in regards to the age groups of people affected by hoarding. Although they did not omit their unknown results, the difference is clear as each age group had drastic changes. We found a larger percentage of people affected by hoarding in the age group under 50 years and much smaller percentage of people affected by hoarding in the age group of 50+ years. Our data suggests 27% of people affected by hoarding involved in fires were in the age group of under 50 years while the 2009 study reveals this age group to account for only 10%. The age group of 50+ years represented a mere 3% of those affected people involved in fires while the 2009 study indicates this age group to account for a larger 23%. Although older people represent the overwhelming majority in both, our results still demonstrate a large increase in this age group as our results indicate those aged 65 years and over represent 70% of hoarding related fires which is a large increase from the findings of the 2009 study.

5.2.3 Property Type

The type of property was recorded in all 60 fires to be either in a house, apartment, or other non-residential buildings. A house was defined as a single family standalone building,

while an apartment was defined as a property that was part of a larger complex. As shown in Figure 30, the most common type of property to experience a hoarding fire was a house at 63% followed by apartments or flats at 28%. In 8% of instances the fire occurred in an outbuilding such as a garage, shed, or non-residential property such as a factory. In the case of the factory, the person used the factory to store the overflow of accumulated items from their home and regularly visited the items to go through them, a behaviour identified as "churning".
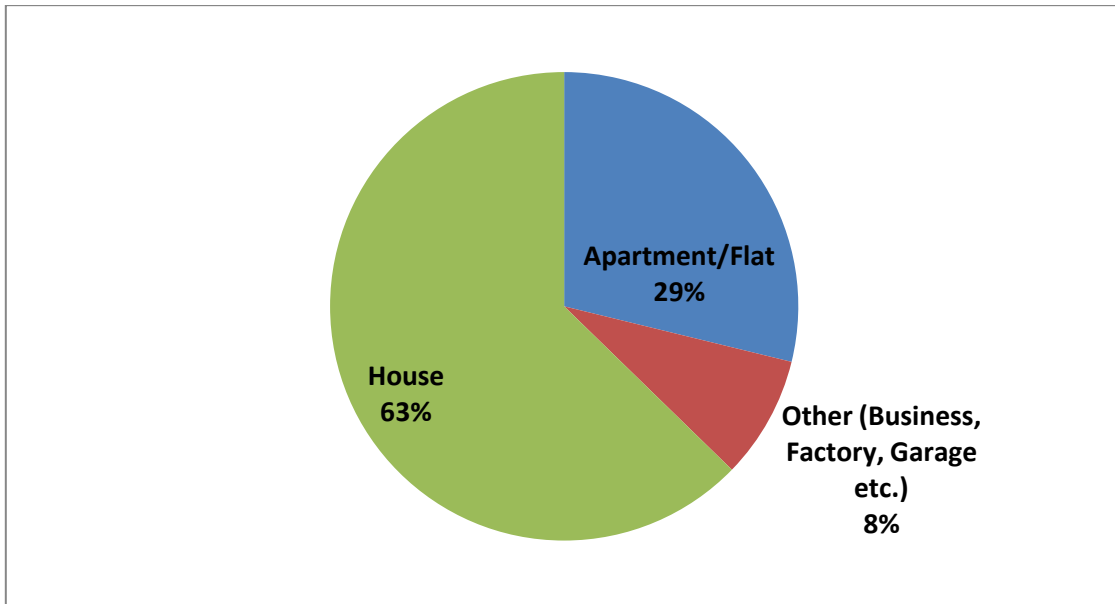

Figure 30: Property Type in Hoarding Fires

Our results were consistent with the findings of the 2009 hoarding study where 69% of fires occurred in homes and 29% occurred in apartments. The 2009 study also found one instance of a "boarding house" that they classified as other, and no non-residential buildings.

5.2.4 Property Tenure

Figure 31 presents the property tenure for 58 of the 60 structures involved in hoarding fires. The majority were owner occupied and accounted for 71% of our distribution while a further 7% were private tenants. Public housing properties accounted for 22%.
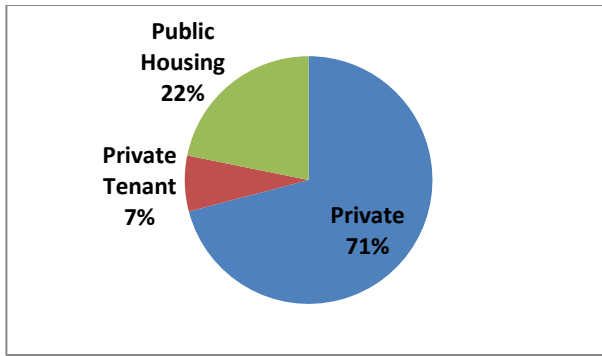
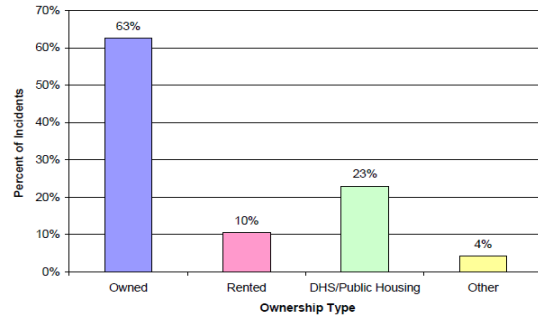**Figure 31: Property Tenure in Hoarding Fires**

Figure 32: Property tenure of Hoarding Fire Victims in 2009 Hoarding Study (Lucini et al, 2009)

These findings remains somewhat consistent with the findings of the 2009 hoarding study shown in Figure 32, where they found 63% of hoarding properties were owner occupied, 10% private tenants, and 23% owned by the Office of Housing. The two unknown tenures were identified as being privately owned or rented rather than Office of Housing properties.

5.2.5 Household Occupancy

Figure 33 describes the household occupancy present at the time of a hoarding fire. The largest category of occupancy was single occupant at 35 instances. People who live alone are clearly at greater risk for fires. The remaining categories do not show any patterns. Given the largest number of victims in this study were older people, the WPI study "Analysis of Preventable Fatalities of Older People and People with Disabilities: Risk Reduction Advice for the Community Care Sector" is worth noting as it identifies older people who live alone as being at risk. People within this cohort who hoard further contribute to an increased risk.
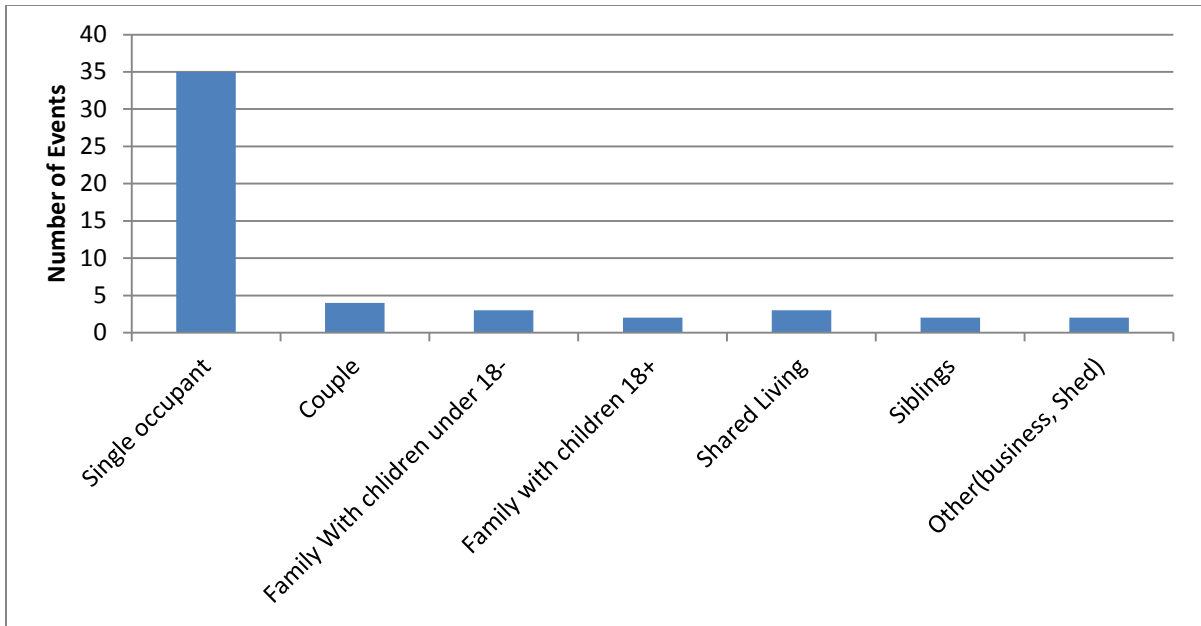
Figure 33: Household Occupancy in Hoarding Fires

5.2.6 Season

Figure 34 shows what season each fire occurred in. The most common season was Spring with 33% of fires. Summer and Winter both accounted for 25%, while Autumn had the least number with 17%.
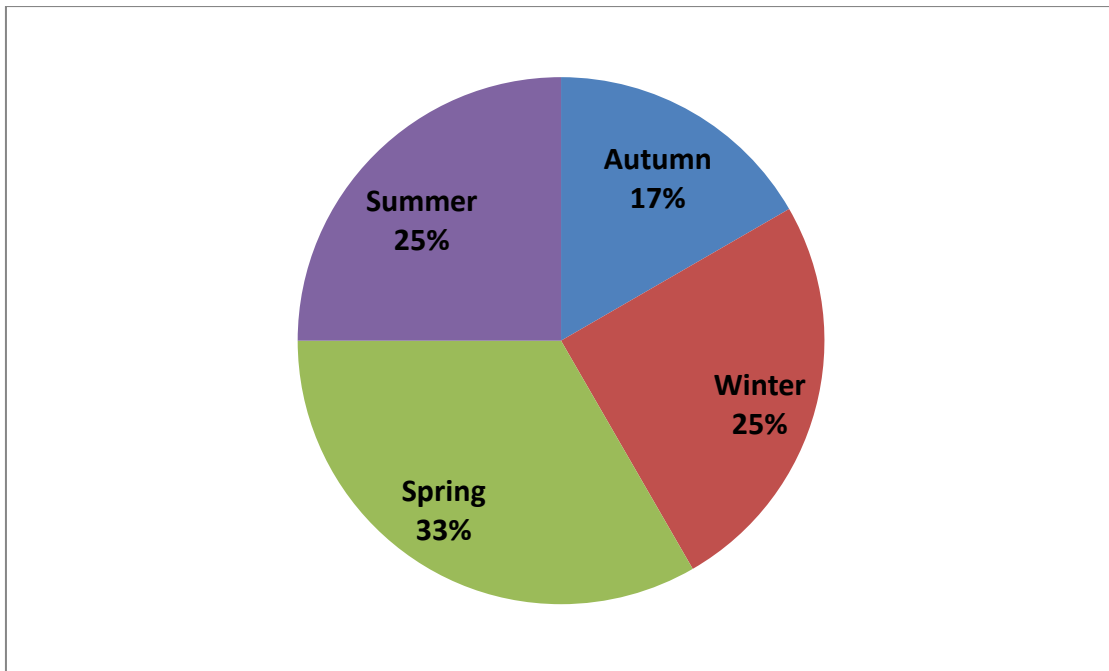

Figure 34: Percentage of Hoarding Fires by Season

The warmer seasons, Spring and Summer, account for the majority of fires. This analysis was compared to all residential fires as shown in Figure 35.
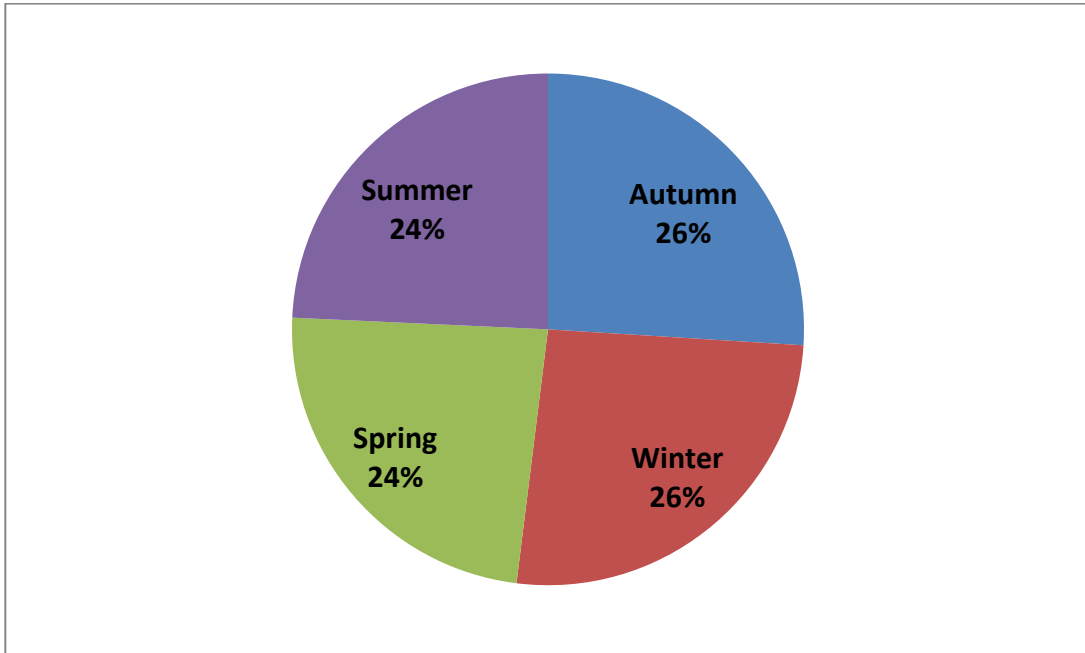

Figure 35: Frequency of Residential Fires by Season

The seasons are almost evenly distributed in with the colder Autumn and Winter seasons having a slight 2% majority. MFB runs an annual Winter fire safety campaign, but these results indicate that Spring is a far more dangerous time for people affected by hoarding.

We examined each individual season in order to see if any patterns emerge in the cause of fire. Only ten fires, the fewest number in any season, occurred in Autumn from March to May and the causes do not reflect any particular trend as seen in Figure 36.
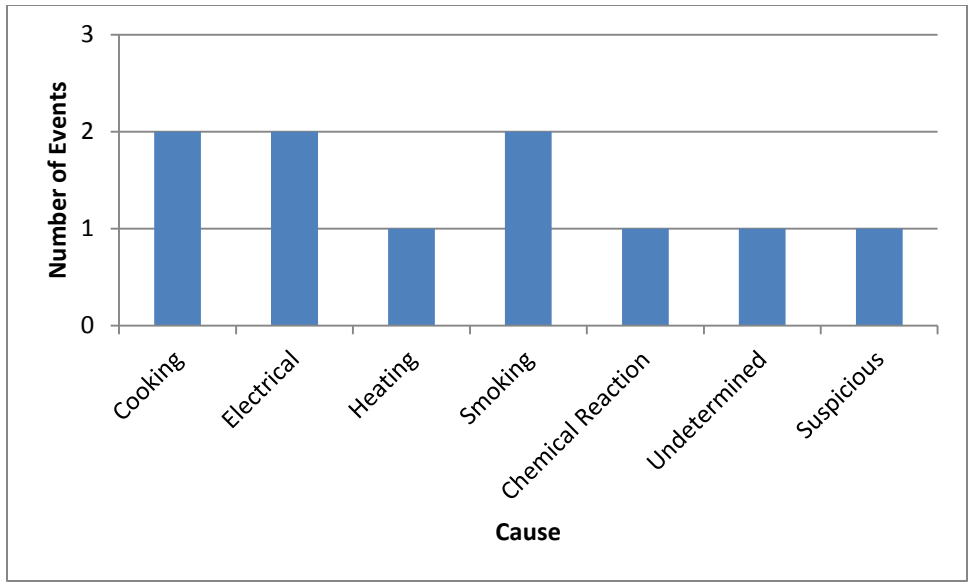
Figure 36: Causes of Hoarding Fires in Autumn

Cooking, electrical, and smoking all occurred twice, while heating was the cause in one instance. There were two instances of some other form of ignition, one being a chemical combustion, and the other being suspicious. In one case the cause could not be determined. It is interesting to note that despite Autumn being the beginning of the cold weather months heating was among the least common causes.
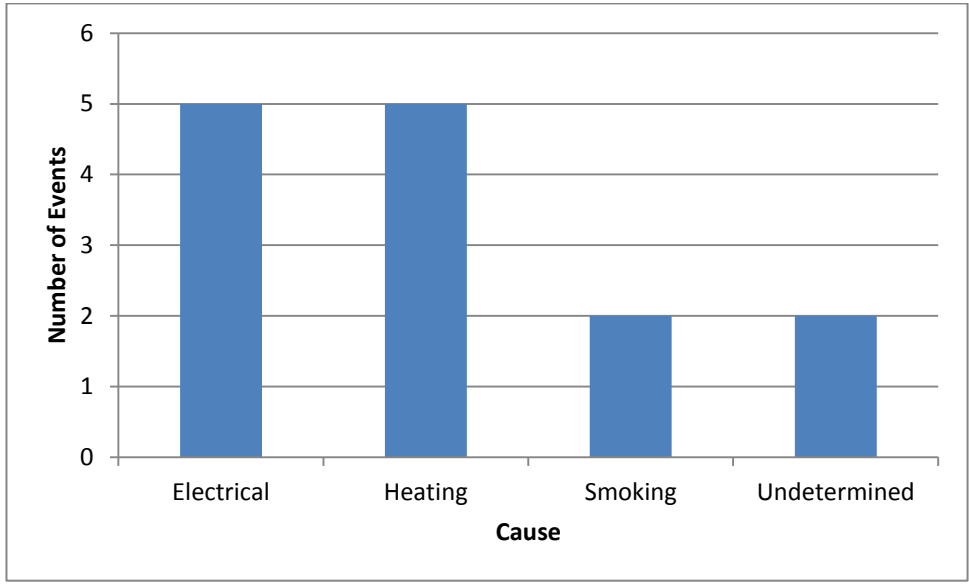

Figure 37: Causes of Hoarding Fires in Winter

A total of fifteen fires occurred in the Winter from June to August. The leading causes of hoarding fire in Winter were electrical and heating with five instances each. It is logical that heating would be a leading cause in Winter as this season sees its highest use. Smoking caused fires in two cases and cooking accounted for another. The cause could not be determined in two of the cases.
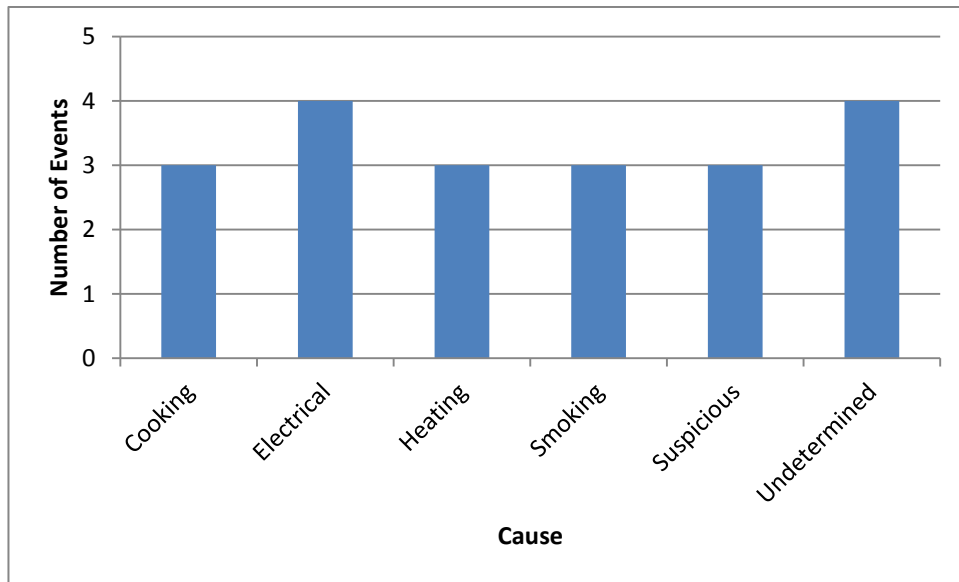
Figure 38: Causes of Hoarding Fires in Spring

Spring from September to November was the most common season for fires with 20 separate instances. Despite this, no clear trend emerges. Electrical was the most common cause with 4 cases. Cooking, heating, smoking, and suspicious fires all had 3 each, and in 4 cases the cause was undetermined. Spring had the highest number of suspicious and undetermined fires. The total number of suspicious fires exceeded those in all other seasons combined, while the number of undetermined fires accounted for half of all undetermined cases.
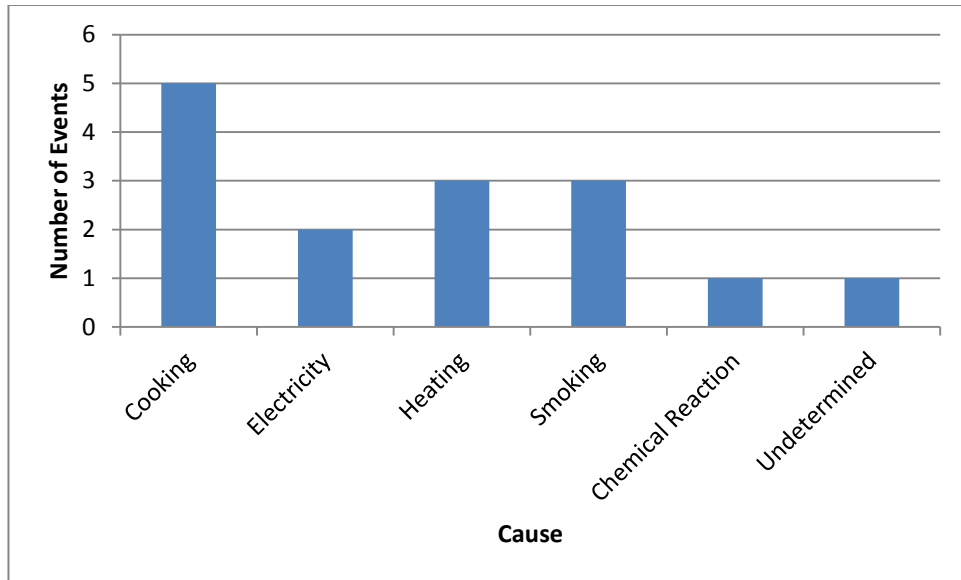
Figure 39: Causes of Hoarding Fire in Summer

Fifteen fires occurred in Summer from December to February with five instances being the result of cooking. Heating and smoking both accounted for three each, while electricity accounted for two causes of fire. A chemical reaction and an undetermined cause each had one instance.

5.2.7 Month

Figure 40 shows the distribution of hoarding fires throughout all twelve month over the last 3 years. The three months with the largest number of fires are June, January and October and represent 28 of the 60 hoarding fires.
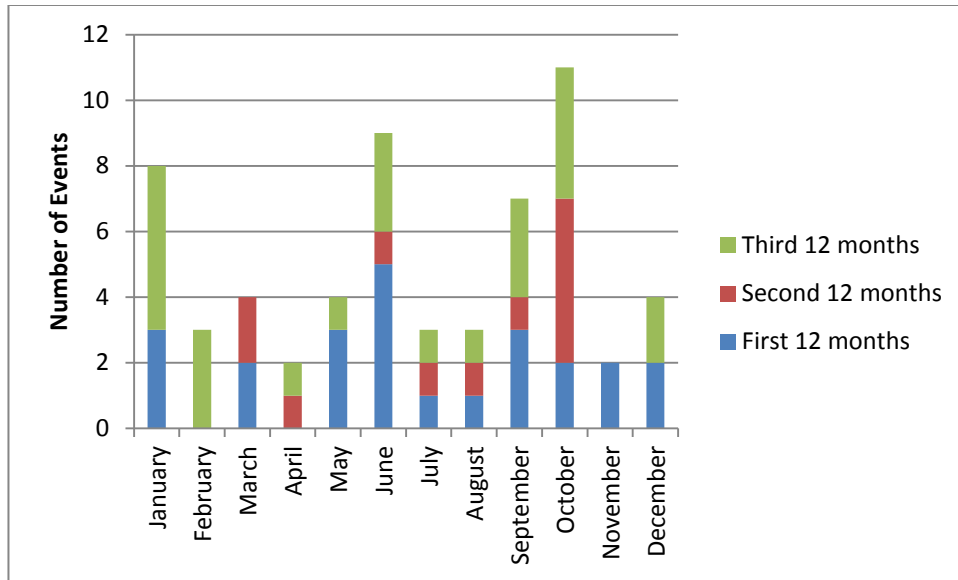
Figure 40: Frequency of Hoarding Fires by Month

October, January and June are consistent with the previous findings that Spring is the most dangerous season followed by Winter and Summer. These months are not the coldest or warmest in Melbourne when cooling or heating will be in constant use. Rather they represent transitional months when climate control is being used inconsistently. They may therefore represent intermittent use of heating and cooling appliance.

Figure 41 shows the distribution of all residential fires by month over the past three years. There is no correlation with distribution of hoarding fires occurring by month and remains generally consistent regardless of the month.

Figure 41: Frequency of Residential Fires by Month

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5.2.8 Time of Day

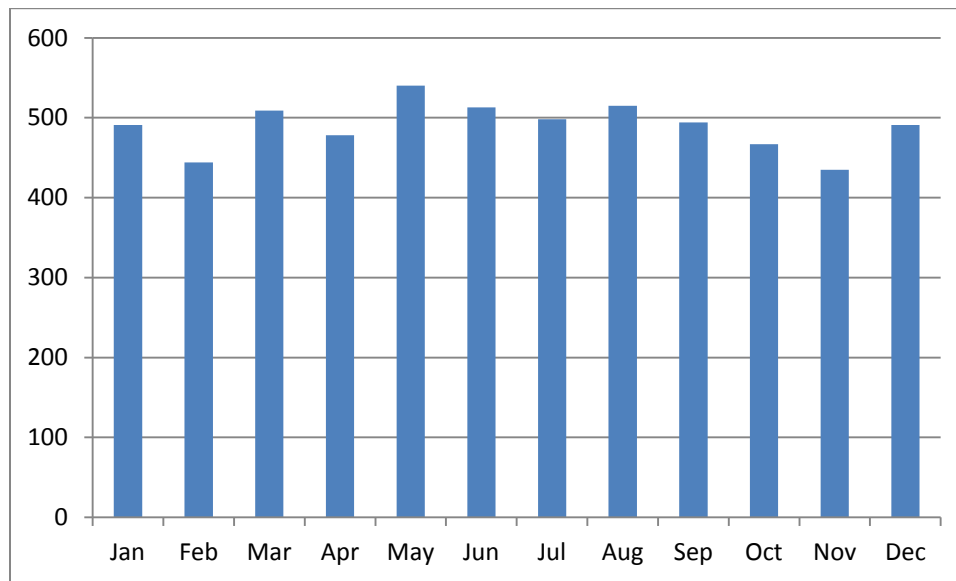When the frequency of the hour of ignition for hoarding fires during the day is analysed in Figure 42, two peaks become apparent around midday and evening meal times. The highest number of fires occurs from 17:00 to 21:00. These three hours account for 17 instances, which represents 28% of all fires. The second highest concentration of fires occurs from 10:00 to 12:00, which represents 23%. These six hours account for 51% of all fire events.
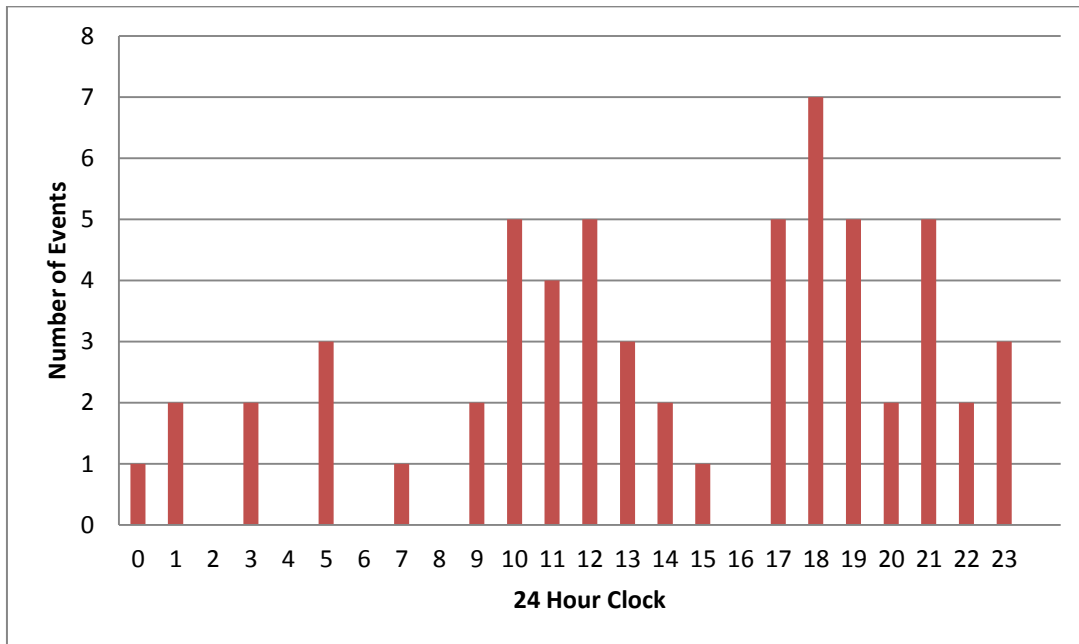
Figure 42: Frequency of Hoarding Fires by Hour

The hour of ignition for all residential fires is shown in Figure 43. The largest percentage of fires also occurs from 17:00 to 21:00, but these only account for 22% of all residential fires. From 17:00 to 21:00 is the regular time when people are cooking dinner and this correlates with the most common room of origin of fires which is the kitchen.
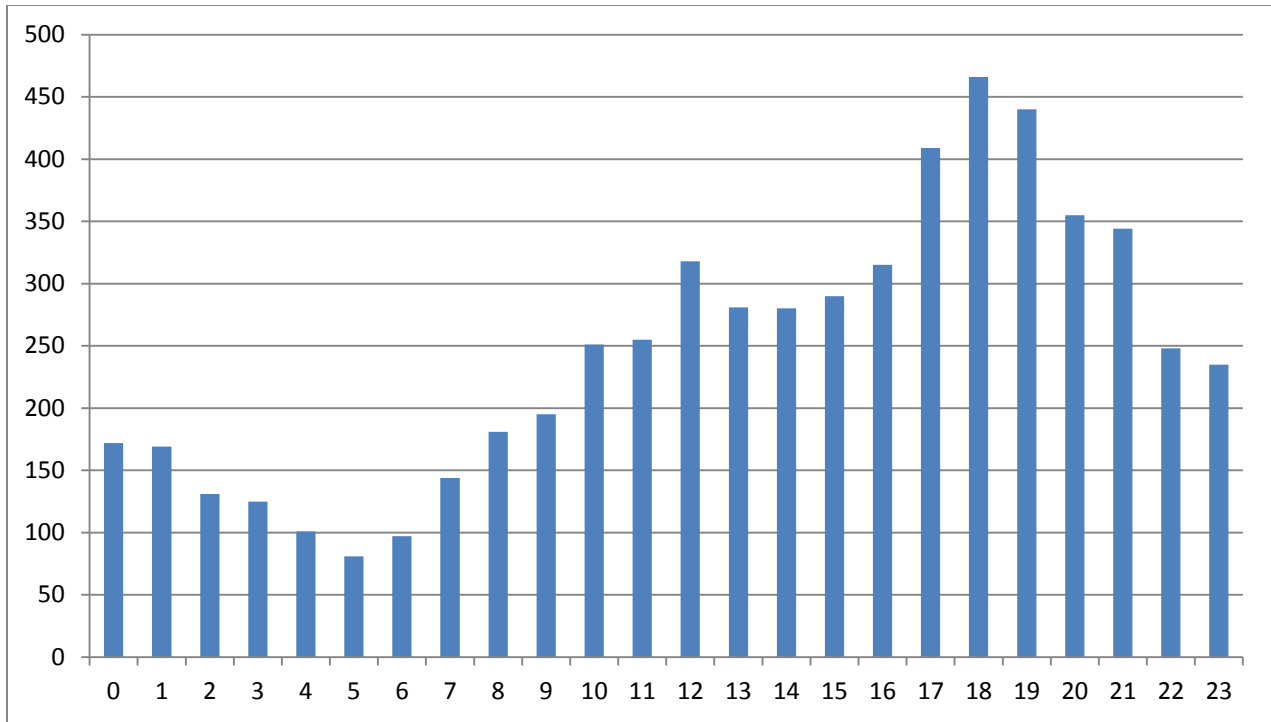
Figure 43: Frequency of Residential Fires by Hour

Figure 44 shows that the point of origin for hoarding fires during the mid-day mealtime (10:00 to 12:00) is most commonly located in the kitchen and dining room. These areas are consistent with what would be logical if people are preparing lunch at these hours. The remaining points of origin are spread throughout 8 different rooms with only the lounge area having more than one occurrence.
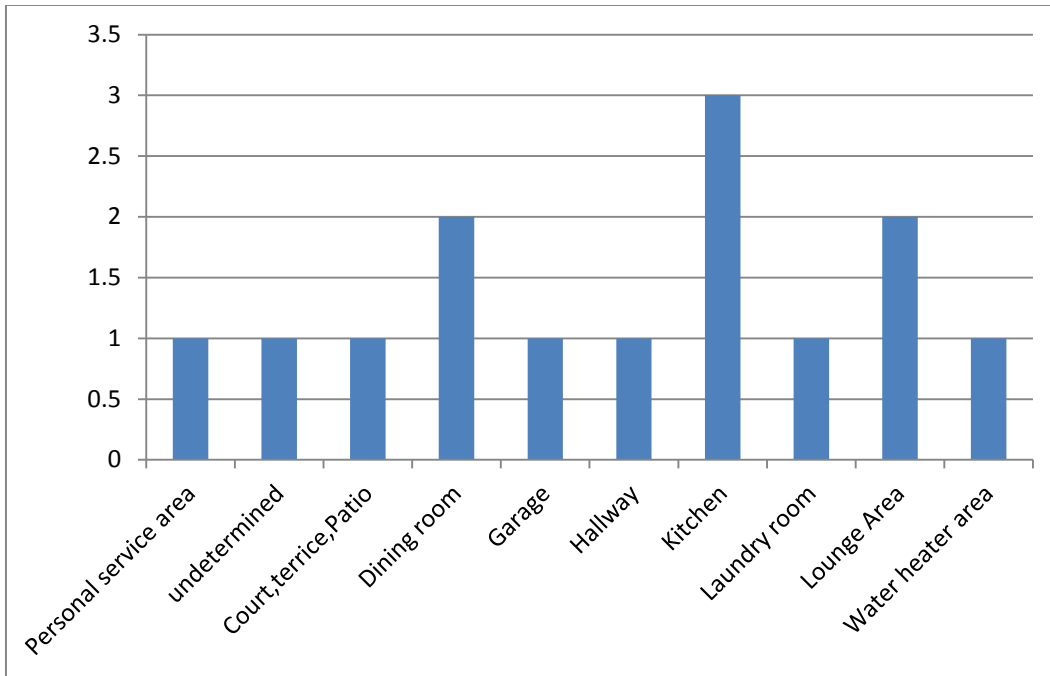
Figure 44: Point of Origin of Hoarding Fires from 10:00 to 12:00

Figure 45 describes the causes of hoarding fires from 10:00 to 12:00. The most common cause was smoking followed by heating. The heating cause is unusual because this time of day is when the temperature is warmer and heating is generally not needed. Despite the most common room of origin being the kitchen or dining room, consistent with what would be a conventional behaviour at this time, only one instance involved cooking.

Figure 45: Causes from 10:00 to 12:00

Figure 46: Point of origin from 17:00 to 19:00

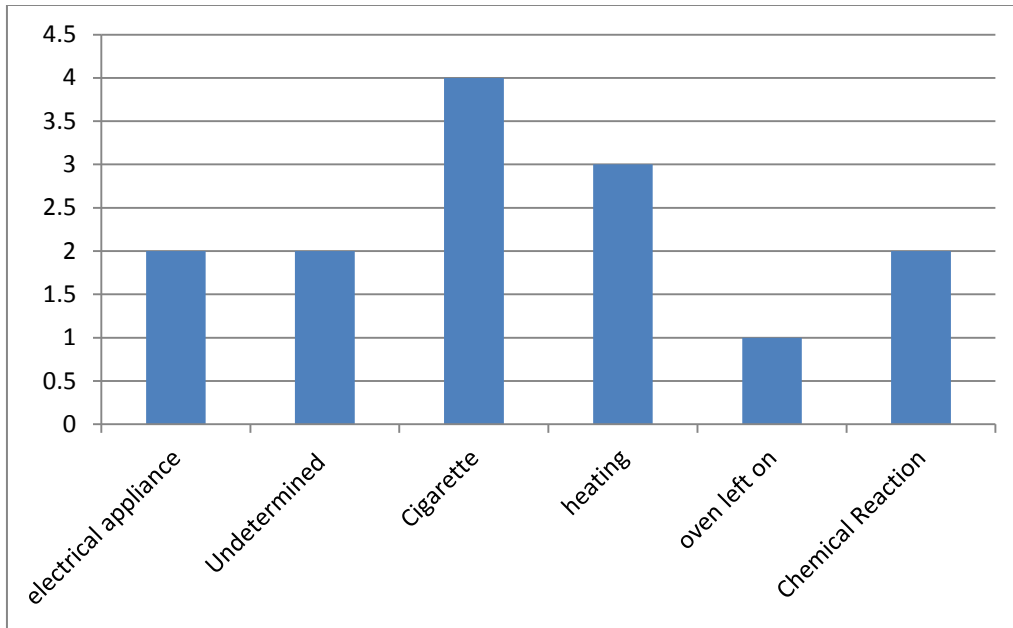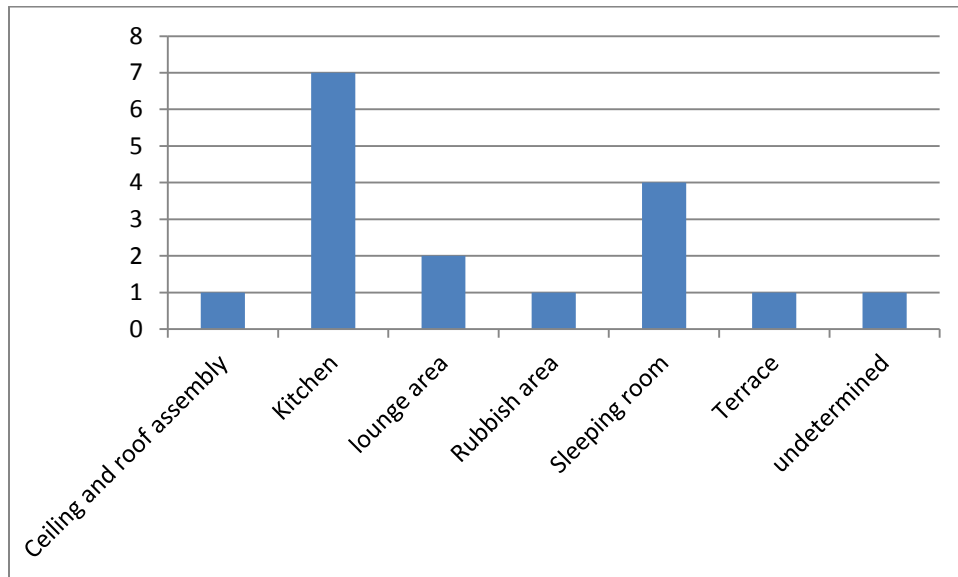Figure 46 shows the point of origin from 17:00 to 19:00. As expected, the most common point of origin is the kitchen with 7 instances or 41% of the fires beginning there. The second most common room or origin is the sleeping room. The remaining instances are scattered throughout the house with no clear pattern.
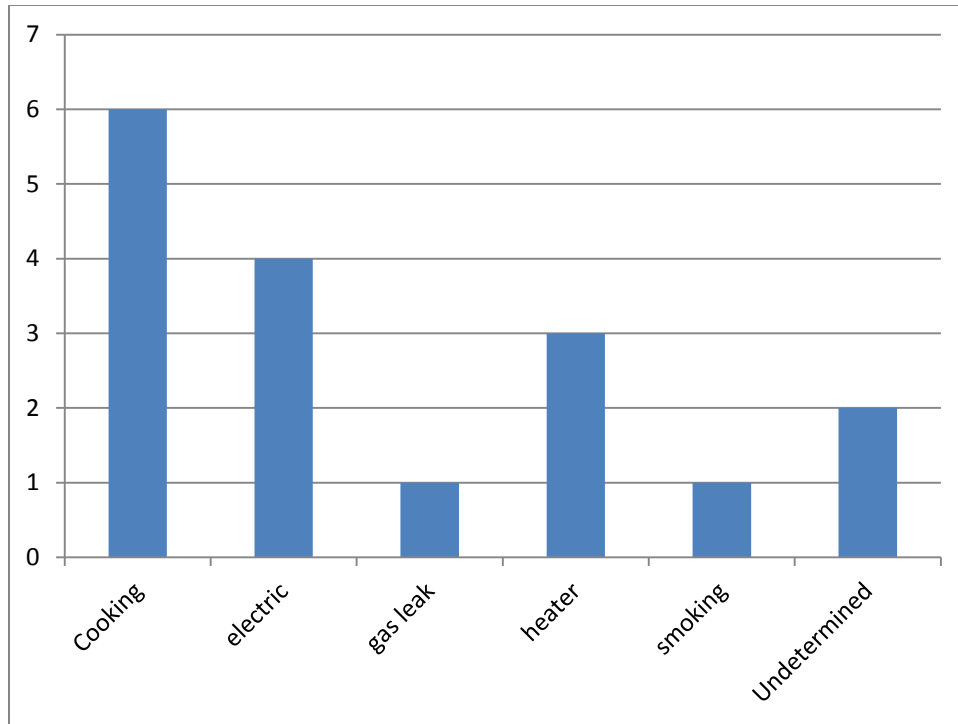
Figure 47: Cause of origin from 17:00 to 19:00

Consistent with the findings in Figure 46, Figure 47 shows that the most common cause of fires was cooking followed by electricity. Heating also accounted for three separate incidents. These results are logical for this time period and indicate people affected by hoarding have the same ignition risks as normal fires during peak times.

5.3 Incident Types

Since the competition of the first hoarding study, an increased organizational awareness of hoarding within MFB resulted in other types of emergency incidents being reported by operational firefighters. The situations were diverse and included emergency medical response and assisting ambulance to remove sometimes unconscious patients buried within the possessions in their home days after a fall or becoming ill.

5.3.1 Classification of Hoarding Fires

Fires involving foodstuffs can occur inside a structure and be classifies as a structure or outside a structure and be classifies as a non-structure fire provided they do not spread to a structure. Structure fires are fires that damage an interior room/s or outside structure. Non

structure fires are instances of fires starting outside a building, such as a lawn, and not spreading to any structure. Figure 48 identifies that the vast number of hoarding related fires in the study were structure fires with only one non structure fire. Of the hoarding related fires, only four which involved foodstuffs were contained to foodstuff and did not spread to other materials.

Figure 48: Structure vs Non-Structure Hoarding fires
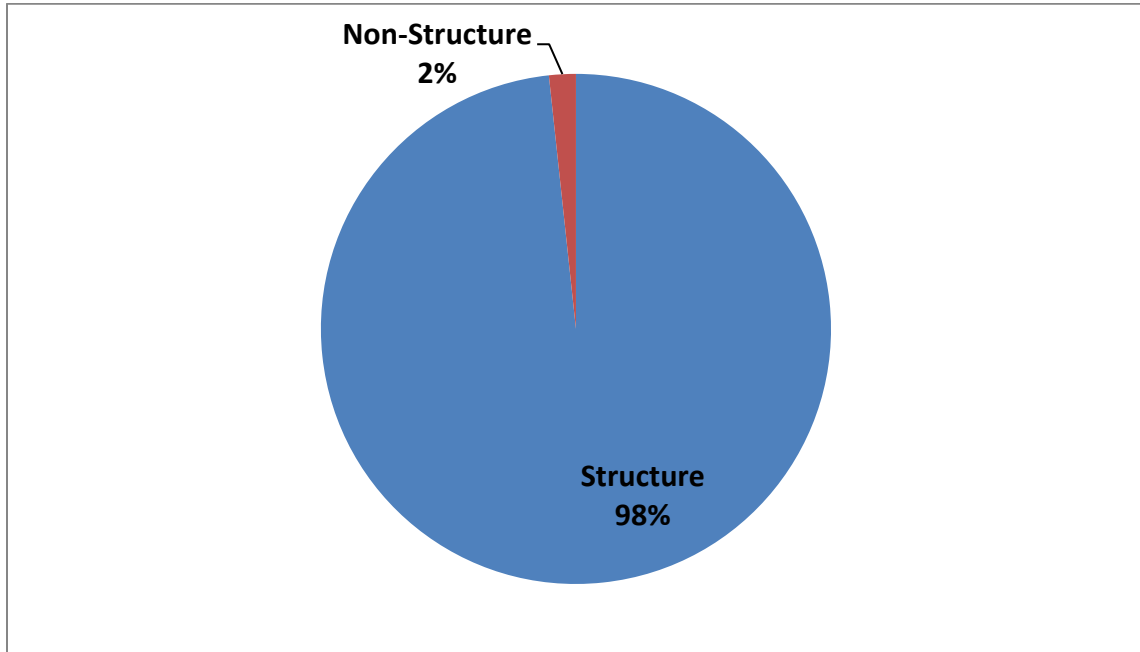
5.3.2 Classification of Hoarding Incidents

There were seven different types of non-emergency incidents MFB operational firefighters responded to. These seven types of non-emergency incidents are displayed in Figure 50.
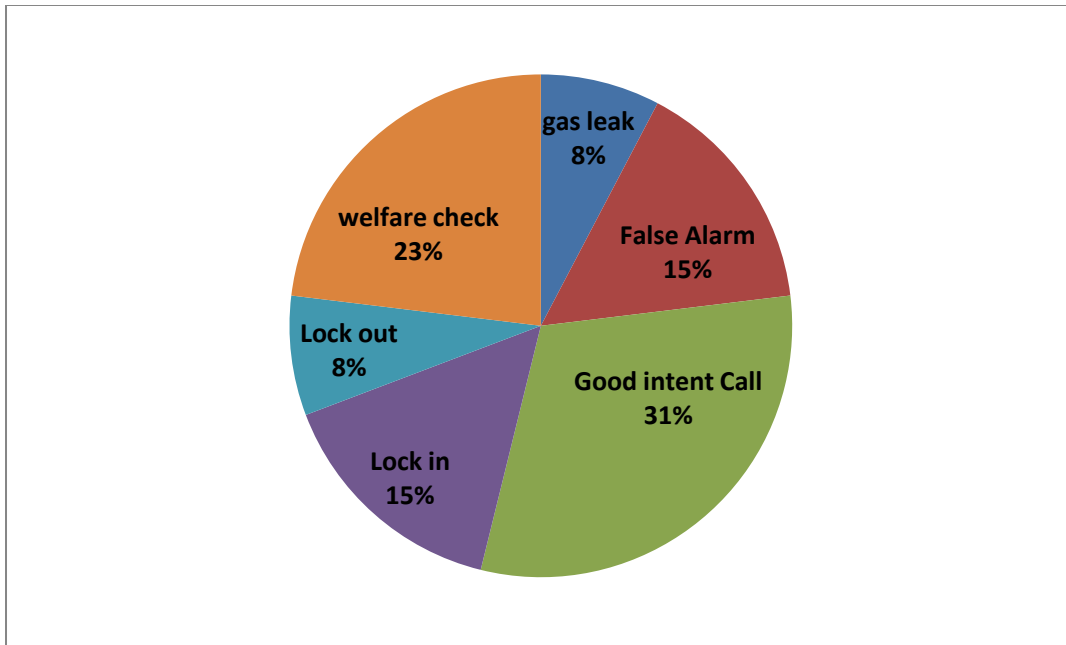
Figure 49: Classification of Hoarding Incidents

Welfare checks, lockouts and lock-ins were all instances where the brigade required forced entry. These events accounted for the largest type of non-emergency incidents comprising of 46% of the cases. False alarms and good intent calls account for another 46%. The remaining 8% were instances where MFB responded to a report of a gas leak in a road and discovered a hoarding house nearby.

MFB will occasionally assist another agency with gaining forced entry to a property. In three events included in this study, MFB assisted the Victoria Police with a welfare check. These types of incidents occur when a family member, friend or neighbour reports concerns regarding an individual who has not been seen and/or is not contactable in a way which differs from their normal behaviour. There was also one event in which a call was placed to "000" requesting MFB assistance in relation to an assessment of individual risk in which police were already in attendance.

MFB will also in some instances respond to cases where a resident is locked in or out of their property. The response to these instances is to force entry into the premise. Forced entry is used usually in the cases where there are conditions of risk in addition to the lock-out such as cooking has been left on or someone is trapped. In these circumstances, speed is more important than the damage from a forced entry and the response prevents an escalation of the situation and the risk. The one case of a lock out was notable in that it didn't involve any sort of emergency.

The resident called "000" to report they had been locked out, but that there wasn't any emergency. The "000" dispatcher inquired if they would prefer to call a locksmith but the resident insisted on the fire brigade. These varied encounters highlight the varied ways in which MFB, through the response of its operational firefighters, identify people affected by hoarding and the high risk environments in which they live.

5.3.3 Types of Hoarding Events

From 3 April, 2009 to 3 April, 2012, MFB operational firefighters responded to 60 fires, 5 EMR calls, and 14 other incidents involving hoarding within the MFD. The 60 fires represented 1% of all the residential fires the MFB operational firefighters responded to during the same period.

Figure 50: Distribution of Hoarding Events
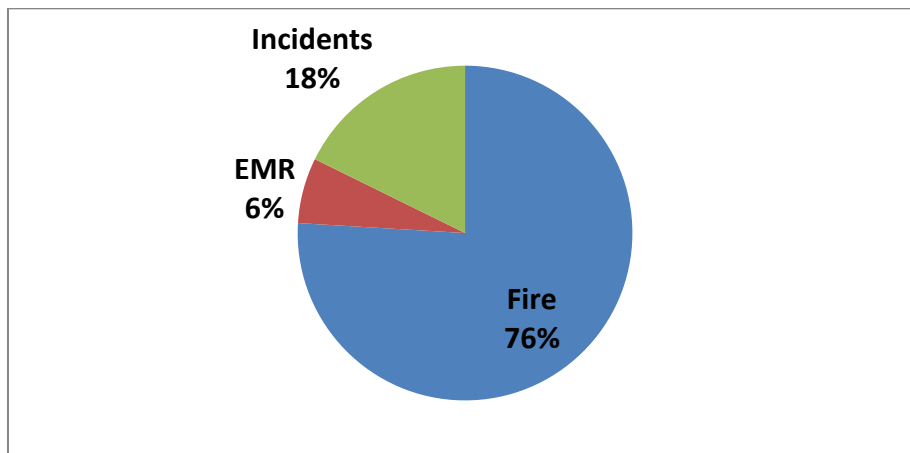
As shown in Figure 51, approximately three-fourths of the identified hoarding events were found when firefighters responded to a fire, 6% were EMR calls, and the remaining 18% were non-emergency incidents. The 2009 hoarding study did not include any EMR or other non-emergency incidents in their analysis. Our study found 19 EMR and non-emergency incidents within the past three years.

5.4 Demographic Information across all Events

The demographics of people affected by hoarding were analysed in an attempt to further refine the target population of this study as well as to provide insight into the people affected by this behaviour.

5.4.1 Gender in all Events

Gender was a difficult category to locate throughout the events. In our 79 total events, sixteen were not included in our data. These difficulties can be attributed to instances where the information was not recorded or not being able to distinguish the primary affected person in instances where there were multiple people living in the premises. There was also difficulty in events where the occupant was either not present or was unwilling to identify themselves to firefighters. Figure 51 indicates that there is an even split between males and females identified as being affected by hoarding.

Figure 51: Gender for Hoarding Events

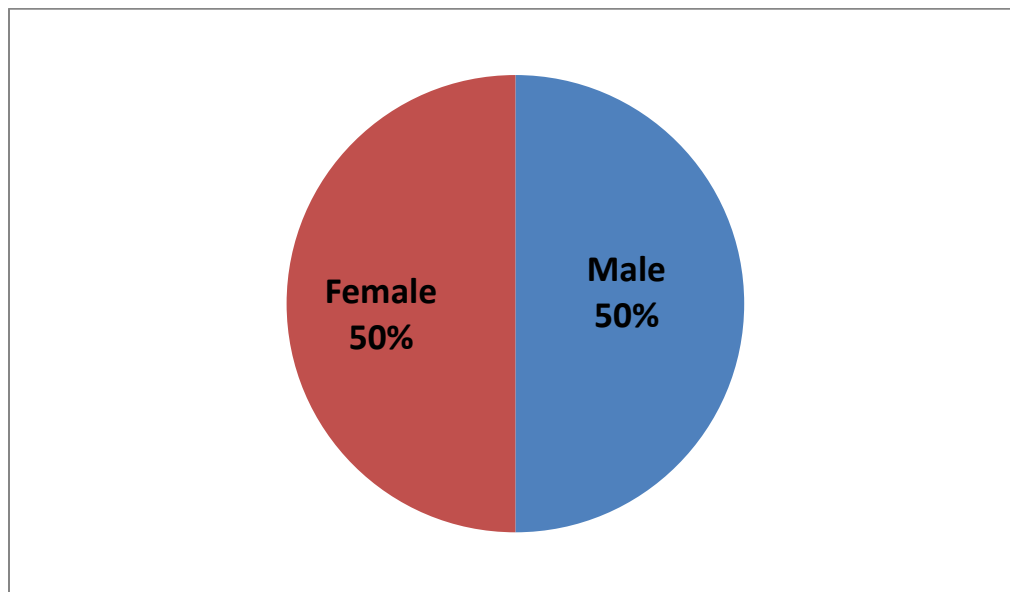### 5.4.2 Age in all Events

Age was the most difficult piece of information to find for these events. The age could not be identified in 40 of these events. This category accounted for the largest underrepresentation of information in comparison to the rest of our data. Figure 52 reveals the distribution of people affected by hoarding of ages under 50 years, 50+ years, and 65+ years. The

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largest age group represented was the age group of 65+ years with 73%. This result was expected as it is consistent with international data stating that hoarding is more prevalent in older people aged 65+ years. However, the age group of 50+ years only consisted of a lower percentage than the age group of affected people under 50 years and could possibly represent an anomaly. This information is also relevant in relation to ageing and high fire risk as people aged 65 years and over are the highest fire risk group living in the community. Older people who are also affected by hoarding increase their already high fire risk status due to the accumulation of items in their homes.
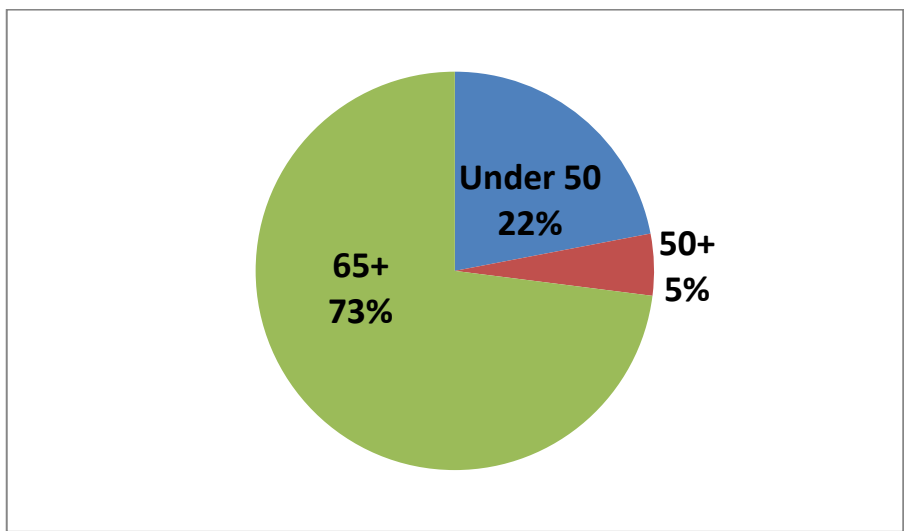
Figure 52: Age for Victims of Hoarding Events

5.4.3 Household Occupancy in all Events

The household occupancy was a vitally important but difficult piece of data to ascertain. In 66 cases, the residents living in a property were identified by the responding firefighters. In the remaining 13 instances, the property was unoccupied or the residents were not recorded in the reports. Figure 54 shows that in all events where a household was identified, a person was living alone 70% of the time. In 27% of cases, there were multiple people living together and 3% of cases occurred in non-residential buildings. Families with minor children make up the second largest type of household supporting the need to engage agencies which respond to issues related to child welfare and protection.
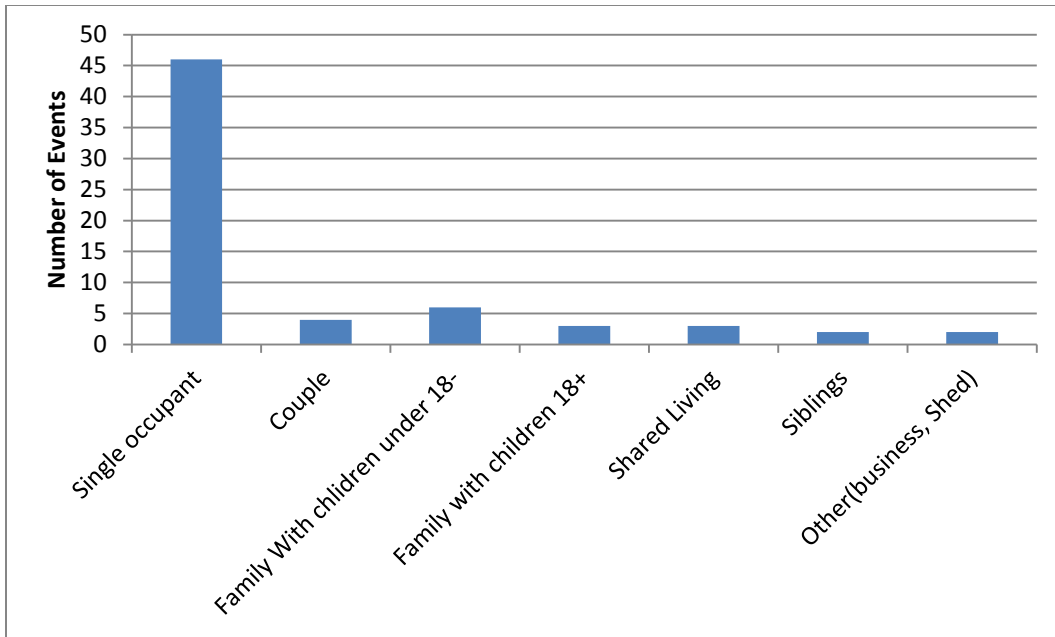
Figure 53: Household Occupancy in Hoarding Events

When comparing the age groups to household occupancy, we found an overwhelming majority of older people aged 65+ living alone. A pie chart of this comparison can be seen in Figure 55. Of the 46 events with a household makeup identified as single occupancy, the age group could not be found in 19 of these cases. We omitted these 19 cases from our results. Of the 27 events with known data, we found 82% of affected people live alone were from the age group of 65+.
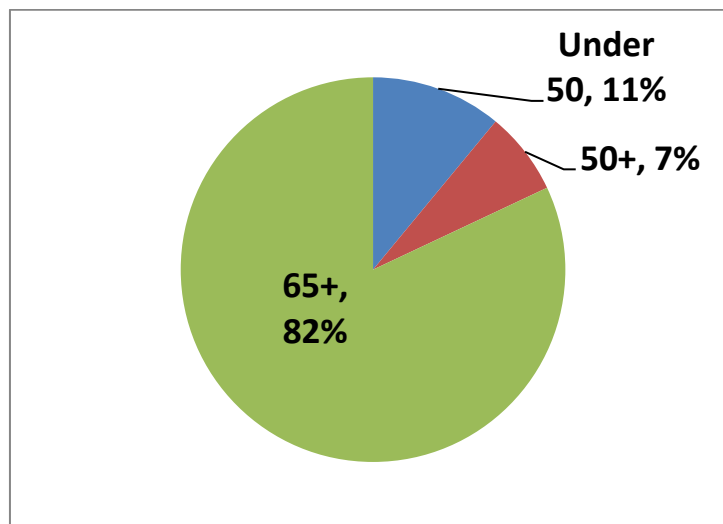
Figure 54: Age Groups amongst Single Occupant Victims of Hoarding Events

5.4.4 Property Type

The type of property was recorded in all 79 events. As shown in Figure 55 the most common type of property to experience a hoarding event is a house at 64% followed by apartments or flats at 28%. A house was defined as a single family standalone building, while an apartment was defined as a property that was part of a larger complex. There were six instances where the fire occurred in an outbuilding such as a garage, shed, or non-residential property such as a factory. In the case of the factory, the person used the factory to store the overflow of accumulated items from their home and regularly visited the items to go through them, a behaviour identified as "churning".
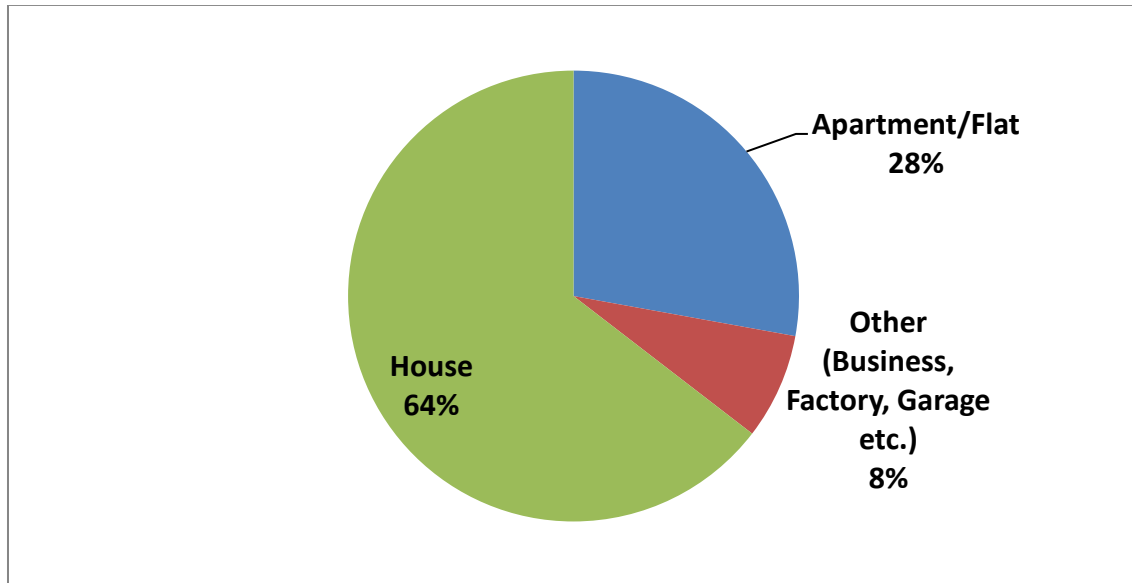
Figure 55: Property Type in All Events

5.4.5 Property Tenure
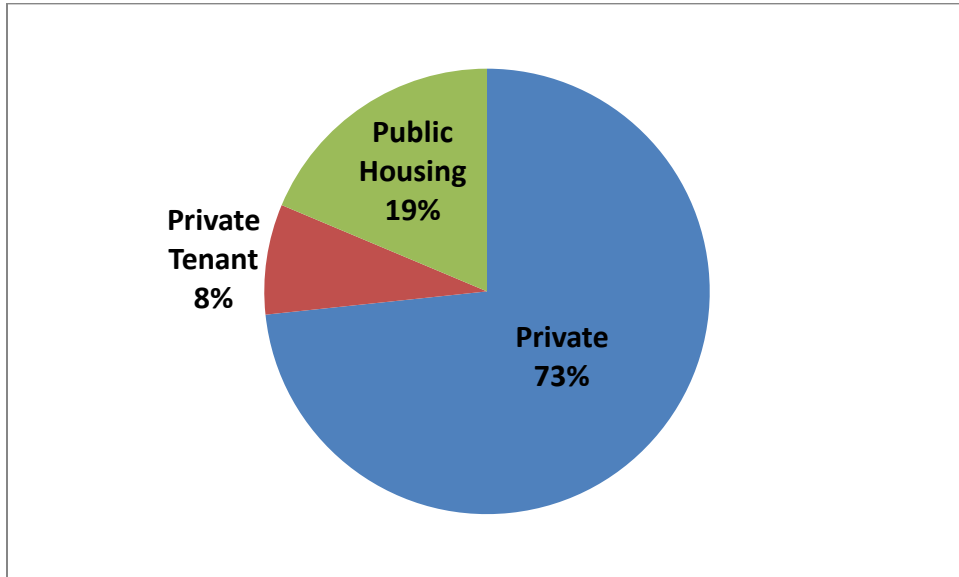
Figure 56: Property Tenure in All Hoarding Events

The property tenure was recorded in 75 instances. Figure 56 shows that of those recorded instances, we found that 73% of the properties were privately owned, 19% were owned by the Office of Housing, and 8% were private tenants.

5.4.6 Location of Hoarding Events

For all events, a suburb and local government area was identified. These events occurred in a variety of locations dispersed throughout the Metropolitan Fire District (MFD). The 79 identified events represented 56 different suburbs. The distribution throughout the MFB is represented in Figure 57.

Figure 57: Suburbs with Hoarding Events

Within the MFD, there are 24 local governing areas. At least one hoarding event was recorded in 19 of the LGA's. The average number of events was 4.1 over 3 years with some LGAs ranging from 1 to 9 separate events. The exact name and number of incidents is shown in Table 2.

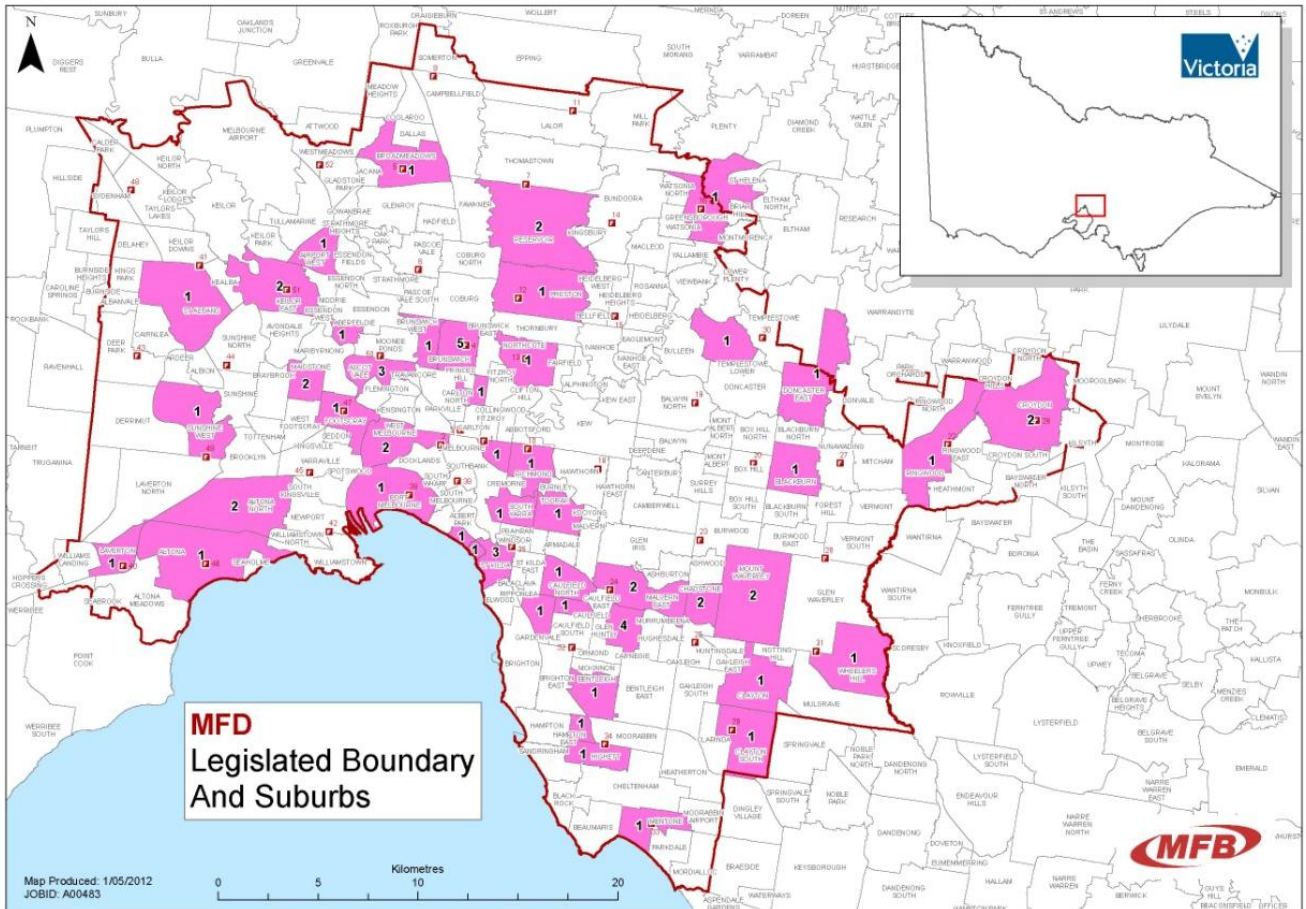| Number of Events	Total Population	Hoarding Events per 100,000 people	Percent single occupancy	Percent older people 60+	Council
3	124340	2.41	23.7	20	Banyule City Council
2	97852	2.04	25.4	21.9	Bayside City Council
2	170439	1.17	25	18.7	Boroondara City Council
2	191619	1.04	17.4	14.9	Brimbank City Council
4	141791	2.82	28.8	19.6	Darebin City Council
9	138372	6.50	29.7	19.7	Glen Eira City Council
4	88335	4.53	25.6	17.8	Hobsons Bay City Council
1	175606	0.57	15.5	11.8	Hume City Council
2	149570	1.34	26.9	20.2	Kingston City Council
5	119438	4.19	16.9	22.5	Manningham city council
3	107309	2.80	24.7	18.3	Maroondah City Council
4	96500	4.15	Unrecorded	9.5	Melbourne City Council
6	179010	3.35	19.8	21.3	Monash City Council
7	113657	6.16	27	19.9	Moonee Valley City Council
7	152225	4.60	28	20.1	Moreland City Council
6	98524	6.09	40.9	14.3	Port Phillip City Council
4	101192	3.95	34.7	18.8	Stonnington City Council
6	157427	3.81	25.1	21.7	Whitehorse City Council
2	80309	2.49	32.4	13.8	Yarra City Council

Table 2: List of LGA's where Hoarding Events Occurred

These suburbs and LGA's are located across all of metropolitan Melbourne and represent every geographic region. Hoarding appears to be a widespread occurrence throughout Melbourne, and is shown to be present in all areas of the city and not just limited to areas of any particular economic background. The most common suburbs to have reported hoarding incidents were Brunswick with five, Carnegie with four, and Ascot Vale and St Kilda with three each.

5.4.7 Season

A time was identified in all of our hoarding fires and 18 of the 19 EMR and incidents. The one unknown is from an incident where the only indication of a time was "afternoon". The date was identified for every event.
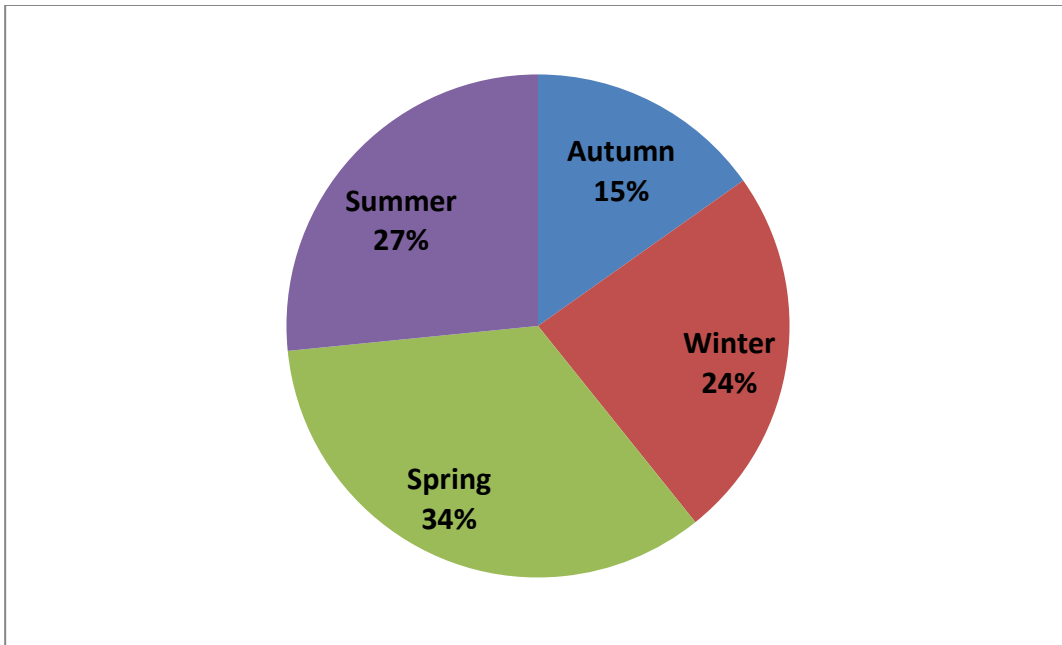
Figure 58: Frequency of All Hoarding Events by Season

The season each event took place is indicated by Figure 58. More than one-third of all the events occurred in the Spring with another 27% occurring in Summer, 24% in Winter and 15% in Autumn. The clear majority of incidents occurred in the warmer seasons.

5.4.8 Month

When the individual months are examined, it is apparent that the highest number of events occurred in October and January as shown in Figure 59. These two months accounted for 29% of all the events.
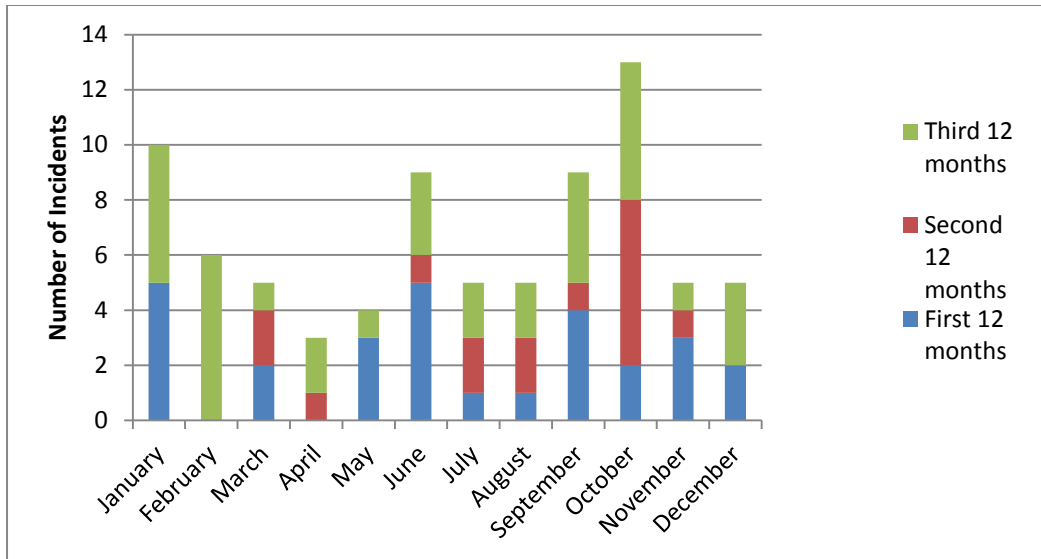
Figure 59: Frequency of All Hoarding Events by Month

5.4.9 Hour

The time of day when a hoarding event occurs, as shown in Figure 60, shows two peaks one around midday and the other in the evening. The timing of EMR and other incidents is scattered throughout the day with no clear trend.
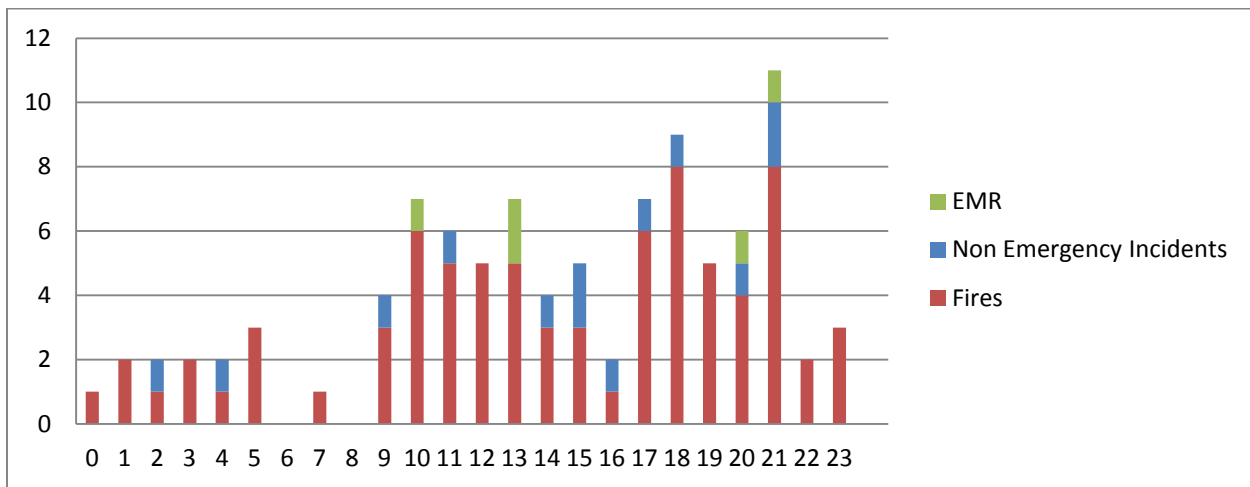
Figure 60: Frequency of All Events by Hour

5.5 Rate of Occurrence of Hoarding Events
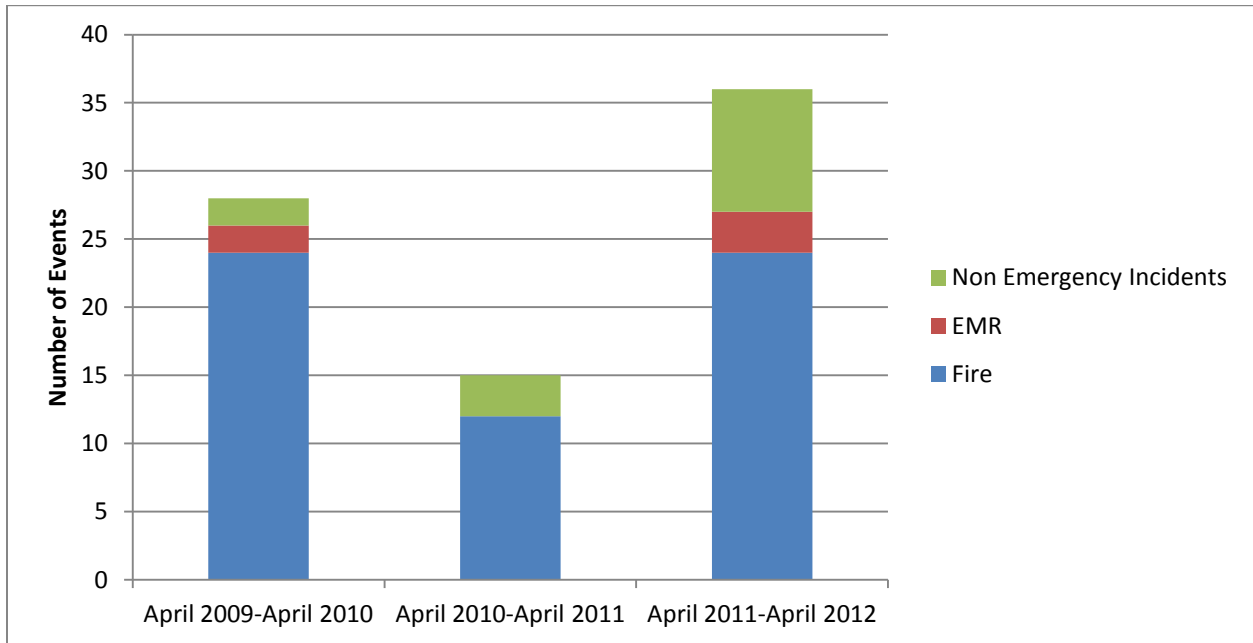
Figure 61: Total Hoarding Events by Year

Our study covered a period of 36 months from April 3, 2009 to April 3, 2012, broken into 12 month periods as shown in Figure 61. There were an average of 20 fires, 1.7 EMR, and 4.7 incidents per year. This incident rate correlates to an average of 26.3 hoarding related events per year or one hoarding event every 13.8 days. In the past 12 months, the number of incidents has had a major increase and MFB is now responding to an incident every 10.2 days. The reporting rate quadrupled in comparison to the reporting rate found in the 2009 hoarding study. Their reporting rate was on average 4.8 fires or one fire every 76 days.

The number of events per year started off above average, with 28 in the first 12 months, followed by sharp decline in the second year with only 15 events in 12 months and then increased again to a total of 36 events. We believe that the trend shown here is actually a measure of reporting rates rather than any change in hoarding behaviours. In the first year following the completion of the first study, the reporting rate would have been high. In the second year, the profile of the issues declined and the incident rate dropped. In June of 2011, MFB Community Resilience began an engagement with senior operational firefighters on the issue of hoarding, the hoarding notification system and the importance of referring on incidents. The incident rate immediately increased across all types of events. The impact that these

engagements with firefighters had on the reporting rate supports the need for MFB to continue to ensure that senior operational officers are engaged and provided with information regarding hoarding and/or squalor.

Chapter 6: Conclusions and Recommendations

MFB identified hoarding as a concern due to the serious safety, health, and well-being risks it poses to affected people and the community. The current research on hoarding is limited, especially from a fire safety and emergency responder perspective. Taking into consideration our previously discussed background and results, we were able to formulate a number of conclusion and recommendations that will be outlined in this section.

The informal methods of searching for hoarding was extremely complicated and difficult yet ultimately far more successful than a formal search of AIRS descriptions. The informal method relied heavily on fire-fighters contacting the Community Resilience department on their own initiative to refer an incident they had attended due to their concerns regarding the safety and wellbeing issues identified at the scene. Despite this, the potential for a person affected by hoarding to "slip through the cracks" is very high.

One of the objectives of this study was to review the current MFB risk reduction advice in relation to the findings of this study. In some instances, the evidence supports the current messaging and in fact reinforces the need for certain action while in others it has identified new areas which need to be incorporated in the risk reduction advice for these households.

Smoke Alarms (see sections 5.6 and 5.11) are essential to reduce risk as they provide early warning for the occupant and give them more time to respond, self-evacuate and get help quicker. Our data reinforces the risk reduction advice of installing and testing smoke alarms and makes a strong case that due to the conditions inside hoarding homes that more than one smoke alarm is recommended to increase the earliest possible warning due to the increased difficulty of escape. This is reinforced by the expected impact the accumulated items will have on responding firefighters in the event of the need to mount search and rescue operations if the occupant has had no early warning or become trapped whilst trying to escape.

Hoarding households pose many fire risks due to the amount of clutter blocking pathways and exits. Many descriptions in AIRS reports portray situations where MFB personnel had difficulty accessing as well as moving within the premises. The amount of clutter blocking exits and egress also creates difficulty for hoarders seeking safety during fires. These situations reinforce the risk reduction advice of unblocking exits and widening internal pathways.

There were many cases during these hoarding fires where utilities needed to be disconnected (see section 5.10). After these fires, hoarders generally do not seek the help of

professionals to re-enable their utilities leading to more unconventional, ad hoc arrangements for cooking, lighting, and heating. These ad hoc arrangements continue to pose severe risks to their health and safety. As these cases continue to arise, referrals made from MFB personnel to external agencies should be prioritised to help reduce further risk. A large percentage of fires were electrical and heating fires. We recommend that clutter and combustibles be removed from nearby heat sources as combustibles near heat sources accounted for a large percentage of heating fires. For electrical issues, we recommend reducing any electrical overloads as these accounted for the majority of all electrical fires within our study.

Hoarding fires occurred more often in homes where a person lived alone and were aged 65 + years. For community service agencies that provide intervention and support for affected people, this helps to refine the victim profile of affected people. Our data is consistent with research which defines those most affected as being older, single occupants. However, our next largest category for household occupancy was families with children under 18. While this figure was low in comparison to the older cohort it clearly indicates that children do live in these types of homes and experience a very high level of fire risk. Additionally, the impact of hoarding in their homes would result in other safety and well-being issues which need to be addressed.

When the MFB began its internal engagement to operational firefighters on the risks of hoarding, the incident rate increased dramatically. Based on these changes in reporting rates, we recommend that MFB continue to expand its internal training and engagement activities to ensure that operational personnel have the knowledge and understanding of the issue and the important role they can play in identifying these incidents. The official roll out of the hoarding notification system provides an excellent opportunity to provide this information to senior officers in addition to an increased level of information about hoarding in all MFB internal recruit and promotional courses. This will increase the information collected through post incident reporting and the capacity of MFB to referral affected individuals and address the long term fire risk in these homes.

The use of AIRS on a national level provides a uniform method of data collection but also results in a significant barrier to make any changes in that is the system used by all fire services. The study has clearly demonstrated that fire services attempting to identify an incidence rate level through AIRS data analysis alone will not be provided with an actual rate at which these incidents occur due to lack of awareness about hoarding and its risks. Lack of evidence is

likely to result in the case for changes to the AIRS data base to be assessed as a priority. Despite this it is recommended that MFB lobby on a national level to have hoarding included in AIRS reporting to ensure that its firefighters are able to easily identify hoarding fires in its post-incident data input. This field would ideally be connected to the clutter image rating to also categorize the scale of the clutter. This will ensure that these fires are identified and that fire services can develop responses to address this currently underrepresented risk.

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Appendix A: Most Frequently Hoarded Items

Description	Rank Order	% endorsing
Clothes	1	89%
Greeting cards, letters	2	79%
Bills, statements	2	79%
Books	3	77%
Magazines	4	68%
Knick-knacks	5	66%
Mementoes, souvenirs	5	66%
Records, tapes	6	64%
Pictures	7	62%
Sentimental objects	8	60%
Recipes	8	60%
Wrapping paper, materials	9	58%
Paper, pens, gifts	10	58%
Stationery, old things	10	56%

(Mogan, 2008)

Appendix B: Clutter Image Rating Scale

Clutter Image Rating: Bedroom
Please select the photo that most accurately reflects the amount of clutter in your room.

(Frost et al., 2008)

Clutter Image Rating Scale: Kitchen

Please select the photo below that most accurately reflects the amount of clutter in your room.

(Frost et al., 2008)

Clutter Image Rating: Living Room

Please select the photo below that most accurately reflects the amount of clutter in your room.

(Frost et al., 2008)

Appendix C: Keyword List

Anormal	Garbage
Abnormal	Goods
Aces	Hoar
Access	Hoarded
Accumulated	Hoarder
Accumulation	Hoarding
Acumulated	Horder
Amount	Hording
Amount of goods	Horeder
Blocked	Hygene
Blocked egress	Hygiene
Blocked entry	Jnk
Blocked exits	Junk
Boarding	Local council
Breach	Materials
Breach of code	Memorabilia
Breach of residential regulations	Narrow
Bric a brac	Narrow hallways
Brick a brack	Narrow pathways
Cans	Narrow walkways
Chattels	Newspaper
Cluter	Numerous
Clutter	Piled
Collection	Piles
Community	Piles of junk
Comunity	Piles of rubbish
Cotents	Pilles
Debris	Poor hygiene
Deny help	Refer
Difficulty	Refuse services
Difficulty accessing	Rubbish
Discarded	Rubish
Disconect	Sqalor
Disconnected	Squalor
Disconnected services	Stock
Filled	Stored
Fire load	Storred
Forced entry	Unsanitary
Fuel load	
Garbage	

Appendix D: MFB Risk Reduction Advice

MFB recommends that in the first instance, individuals or agencies assisting those affected by hoarding should:

- Install smoke alarms and test them
- Unblock exits
- Widen internal pathways
- Check utilities are connected
- Prioritise removing clutter from around cooking area and stove tops as 39% of fires in hoarding homes result from cooking
- Ensure clutter is removed from around heaters and electrical items and discourage the use of open flame as combined these factors account for 44 % of fires in hoarding homes

(Metropolitan Fire and Emergency Services Board, 2009b)

Appendix E: Hoarding Incident AIRS Call Numbers and Year

CALL #	DATE	CALL #	DATE
90505067	2009	110601006	2011
506161	2009	601675	2011
90509042	2009	702386	2011
604483	2009	110805631	2011
604978	2009	110902486	2011
90605126	2009	110908922	2011
90605118	2009	110910114	2011
90606768	2009	111003049	2011
90707121	2009	111004550	2011
90802431	2009	111010294	2011
906040	2009	111012485	2011
90906163	2009	1205854	2011
90908708	2009	111211982	2011
91000758	2009	120100737	2012
91000846	2009	105740	2012
1107873	2009	106961	2012
1112391	2009	108907	2012
91204841	2009	110281	2012
1205953	2009	202605	2012
100100404	2010	120204484	2012
100101850	2010	120207533	2012
106874	2010	909848	2009
100300923	2010	100585	2010
100311644	2010	409338	2011
100411471	2010	708098	2011
100602790	2010	1204517	2011
703071	2010	1111247	2009
100800157	2010	100252	2010
907179	2010	707891	2010
1005915	2010	806738	2010
1005919	2010	1004783	2010
101007641	2010	1100979	2011
101008068	2010	800833	2011
101010352	2010	910511	2011
110301282	2011	1004868	2011
110310416	2011	NA	2011
110408057	2011	209432	2012
110509160	2011	209558	2012
110601074	2011	209950	2012
		300152	2012

Appendix F: Metropolitan Fire Brigades Act

SECTION 2

Purposes

2. Purposes

The main purposes of this Act are-

  (a) to provide for fire safety, fire suppression and fire prevention
       services and emergency response services in the metropolitan fire
       district; and

  (b) to establish a Metropolitan Fire and Emergency Services Board.

SECTION 72

Board or brigades may carry out fire prevention work

72. Board or brigades may carry out fire prevention work

(1) The Board, at the request of-

  (a) the owner or occupier of any land;

  (b) a Minister in whom any land is vested;

  (c) a municipal council or public authority-

  (i) in which any land is vested;

  (ii) that has any land under its control or management;

  (iii) that is responsible for the care and management of any road- may
        carry out on that land or road any work (including burning) for the
        removal or abatement of any fire danger or for the prevention of the
        occurrence or spread of fire.

(2) Any work carried out under subsection (1) must be paid for by the owner,
occupier, Minister, council or authority requesting the work and, if not
paid,
is recoverable in the Magistrates' Court as a debt due to the Board.

(3) Subject to the general direction and control of the Chief Officer, the
members of any unit, with the consent of the relevant owner, occupier,
Minister, council or authority, may carry out any work (including burning)
that the senior member of the operational staff in the unit thinks necessary
or expedient for the prevention of the occurrence or spread of fire.

(4) In this section senior member of the operational staff has the same
meaning as it has in section 32B.