

May 2014

# An Analysis of Hoarding and Squalor Related Incidents and Responses by the Metropolitan Fire and Emergency Services Board

Benjamin Douglas Morse  
*Worcester Polytechnic Institute*

David Franciose Scott  
*Worcester Polytechnic Institute*

Jason Ballou Lackie  
*Worcester Polytechnic Institute*

Molly Elizabeth Homchenko  
*Worcester Polytechnic Institute*

Follow this and additional works at: <https://digitalcommons.wpi.edu/iqp-all>

---

## Repository Citation

Morse, B. D., Scott, D. F., Lackie, J. B., & Homchenko, M. E. (2014). *An Analysis of Hoarding and Squalor Related Incidents and Responses by the Metropolitan Fire and Emergency Services Board*. Retrieved from <https://digitalcommons.wpi.edu/iqp-all/2690>

This Unrestricted is brought to you for free and open access by the Interactive Qualifying Projects at Digital WPI. It has been accepted for inclusion in Interactive Qualifying Projects (All Years) by an authorized administrator of Digital WPI. For more information, please contact [digitalwpi@wpi.edu](mailto:digitalwpi@wpi.edu).



**WPI**



# **An Analysis of Hoarding and Squalor Related Incidents and Responses by the Metropolitan Fire and Emergency Services Board**

**Melbourne, Victoria, Australia**

An Interactive Qualifying Project to be submitted to the Faculty of Worcester Polytechnic Institute in partial fulfilment of the requirements for the degree of Bachelor of Science

Submitted by:

Molly Homchenko  
Jason Lackie  
Benjamin Morse  
David Scott

Submitted to:

Project Advisors:

Prof. Seth Tuler, Worcester Polytechnic Institute  
Prof. Andrew Klein, Worcester Polytechnic Institute

MFB Project Liaisons:

Julie Harris, Manager At Risk Groups  
Geoff Kaandorp, Senior Research & Evaluation Officer  
Acting Station Officer Nick Petersen, At Risk Groups  
Assistant Chief Fire Officer Rob Purcell, Director Community Resilience  
Commander John Rampling, Manager Public Education

May 7, 2014

*This project represents work of WPI undergraduate students submitted to the faculty as evidence of progress towards a degree requirement. WPI routinely publishes these reports on its web site without editorial or peer review. For more information about the projects program at WPI, see <http://www.wpi.edu/Academics/Projects>*

## **Abstract**

This project is intended to assist the Metropolitan Fire and Emergency Services Board (MFB) of Melbourne, Victoria, Australia by quantifying and analysing all identifiable hoarding and squalor related incidents that MFB has responded to within the Metropolitan District (MD) from 4 April 2012 to 3 April 2014. The increased rate of reported incidents found in this study confirms the prevalence and severity of hoarding and squalor as ongoing risks for affected individuals and the community. This study recommends MFB and other fire services work in collaboration to develop information for firefighters about hoarding and squalor and to identify, define, and reduce its risks.

## **Acknowledgements**

This project would not have been possible without the support and help of many individuals and organisations. We would like to first thank our sponsor liaison, Julie Harris, Manager At Risk Groups of Community Resilience at MFB. Her knowledge, support, and guidance were invaluable over the course of this study, and it could not have been completed without her. Special thanks to Nick Petersen for his experience within Community Resilience and Geoff Kaandorp for his technical and writing advice as a research officer. We also like to acknowledge Rob Purcell and John Rampling for their leadership at MFB and recognizing the importance of this study.

Thank you to Professor Steve Macfarlane for your leading information and research in the field of squalor necessary for the background of this study.

We would also like to thank our project co-advisors, Professor Seth Tuler and Professor Andrew Klein for their guidance throughout this project. They provided hours of feedback and consultation throughout this experience and would not have been completed successfully without their academic advice.

## **Personal Account**

### *Hoarding can affect anyone, anywhere*

My grandparents kept things for many different reasons. Growing up in the Great Depression Era of the 1930's, they didn't have many possessions or much money when they were young. These factors combined with always thinking of a use for anything they saw for a project or purpose. While they had great intentions, more often than not, the projects did not occur. My grandparents lived in no ordinary home. It was a huge 24 room inn built in the late 1700's, and they shared it with my great aunt and uncle who lived in a different section of the home. What they all shared was the same way of thinking about things and how they could be saved and used again. Over a long time, this shared thinking resulted in them living with a lot of things all waiting to be used.

By the time they passed away and our family inherited the home, the task was overwhelming. Clearing and emptying the home was so large a task that a person was found to help us. During this process, there were break-ins and vandalism as the home was vacant. Strangely enough, we were always afraid of someone breaking in and starting a fire, because once it began, there would be no way to stop it.



In 2012, a fire started in the home which rapidly spread across both levels and raced through its 24 rooms. According to the press release, 11 fire departments from two different states responded to this 3<sup>rd</sup> alarm call.



Firefighters on scene had to hose down a house 18 meters away due to the intensity of the blaze. One firefighter claimed that he could see the smoke from the house when they pulled out of the fire station several kilometres away. I was in class the next day when my father texted to tell me about the fire and that everything was gone – the house and all those things that might have had a purpose.

- WPI Hoarding Study Team Member

*Hoarding can affect anyone, anywhere.*

## Authorship Page

<b>Section</b>	<b>Author</b>
Abstract	Lackie/Scott
Acknowledgements	Morse
<b>1. Introduction</b>	Morse
<b>2. Background</b>	
2.1 Compulsive Hoarding	Scott
2.2 Squalor	Scott
2.3 Children of Hoarding and Squalor Households	Lackie
2.4 MFB Responses to The Risks of Hoarding and Squalor	Lackie
2.5 Background to MFB Response to the Risk of Hoarding and Squalor	Lackie/Homchenko/Morse
2.6 Background Summary	Lackie
<b>3. Methodology</b>	
3.1 Identify Hoarding and/or Squalor Incidents and Referrals Occurring During the Study Period	Homchenko
3.2 Analyse Available Data of Identified Incidents during the Study Period and Compare Findings to the 2009 and 2012 WPI/MFB Hoarding Studies when Applicable	Homchenko
<b>4. Results and Analysis</b>	
4.1 Characteristics of Hoarding and/or Squalor Related Fires	Homchenko/Morse
4.2 Characteristics of All Hoarding and/or Squalor Related Incidents	Homchenko/Morse
4.3 Results Summary	Homchenko
<b>5. Conclusions and Recommendations</b>	
5.1 Conclusions	Lackie/Scott
5.2 Recommendations	Lackie/Scott
<b>Appendix A: Clutter Image Rating</b>	N/A
<b>Appendix B: Keyword Database</b>	Homchenko

*All members contributed to the drafting and editing phase of the sections. The author represented on the page contributed major edits to the respective sections. The data collection was contributed equally by each group member.*

## Table of Contents

Abstract .....	i
Acknowledgements .....	ii
Personal Account .....	iii
Authorship Page .....	v
Executive Summary .....	xi
Chapter 1: Introduction .....	18
Chapter 2: Background .....	20
2.1 Compulsive Hoarding .....	20
2.1.1 Causes of Compulsive Hoarding .....	21
2.1.2 Consequences of Compulsive Hoarding .....	22
2.1.3 Measuring Compulsive Hoarding .....	23
2.1.4 Current Approaches to Treating Compulsive Hoarding .....	24
2.2 Squalor .....	25
2.2.1 Causes of Squalor .....	25
2.2.2 Consequences of Squalor .....	26
2.2.3 Measuring Squalor .....	26
2.2.4 Current Approaches to Treating Squalor .....	27
2.3 Children of Hoarding and Squalor Households .....	27
2.4 MFB Responses to the Risks of Hoarding and Squalor .....	29
2.4.1 Hoarding Related Risks .....	29
2.4.2 Squalor Related Risks (With or Without Hoarding) .....	33
2.5 Background to MFB Response to the Risk of Hoarding and Squalor .....	34
2.5.1 Research and Evidence .....	36
2.5.2 Engagement of Internal and External Stakeholders .....	38
2.5.3 Operational Response Considerations for Firefighters .....	39
2.5.4 Referrals .....	41
2.5.4.1 Internal/External Referrals .....	42
2.5.4.2 External/External Referrals .....	43
2.5.5 Hoarding Notification System .....	43
2.5.6 Inspections .....	45



2.6 Background Summary.....	46
Chapter 3: Methodology .....	47
3.1 Identify Hoarding and/or Squalor Incidents and Referrals Occurring During the Study Period .....	47
3.1.1 MFB Hoarding and/or Squalor Referrals .....	48
3.1.2 Identify Hoarding and/or Squalor Incidents in AIRS .....	49
3.1.3 AIRS Address Search .....	51
3.2 Analyse Available Data of Identified Incidents During the Study Period and Compare Findings to the 2009 and 2012 WPI/MFB Hoarding Studies When Applicable .....	51
Chapter 4: Results and Analysis .....	53
4.1 Characteristics of Hoarding and/or Squalor Related Fires.....	53
4.1.1 Cause of Fire.....	53
4.1.2 Point of Origin .....	55
4.1.3 Presence and Operational Status of Smoke Alarms .....	57
4.1.4 Alarm Level .....	58
4.1.5 Total Number of Appliances and Total Number of Pumpers.....	60
4.1.6 Total Number of Personnel.....	61
4.1.7 Containment of Fire.....	62
4.1.8 Estimated Structural Dollar Loss.....	63
4.2 Characteristics of All Hoarding and/or Squalor Related Incidents .....	64
4.2.1 Incident Type .....	65
4.2.2 Age.....	66
4.2.3 Gender .....	68
4.2.4 Property Type .....	69
4.2.5 Property Tenure .....	70
4.2.6 Location .....	72
4.2.7 Season.....	73
4.2.8 Time of Day.....	74
4.2.9 Incident Rate.....	76
4.2.10 Referral Rate.....	77
4.2.11 Multiple Incidents.....	78

4.1.12 Emergency Response Incidents Involving a Deceased Person in a Home with Hoarding and/or Squalor .....	78
4.2.13 Hoarding Notification System .....	79
4.3 Results Summary.....	80
Chapter 5: Conclusions and Recommendations .....	81
5.1 Conclusions .....	81
5.2 Recommendations .....	83
Works Cited .....	86
Appendix A: Clutter Image Rating .....	88
Appendix B: Keyword Search Information .....	91
Appendix B.1: Keyword Listing with Categories .....	93
Appendix B.2: Keyword Database.....	99
Appendix B.3: Keywords Producing Confirmed Incidents of Hoarding and/or Squalor Ranked by Number of Incidents Produced.....	105
Appendix B.4: Keywords by Success Rate.....	106
Appendix B.5: Excluded Keywords.....	110

## Table of Figures

Figure 1: Most Commonly Hoarded Items .....	22
Figure 2: Example of Difficult Access to Exterior of Home .....	30
Figure 3: Example of Difficult Access to Interior Room .....	31
Figure 4: Example of squalor.....	33
Figure 6: Example Keywords .....	49
Figure 7: Causes of Fire for Hoarding and/or Squalor Fires .....	54
Figure 8: Point of Origin for All Hoarding and/or Squalor Related Fires .....	55
Figure 9: Point of Origin for Hoarding and/or Squalor Related Structure Fires .....	56
Figure 10: Point of Origin of Hoarding Fires from 2012 Hoarding Study .....	56
Figure 11: Presence of Smoke Alarms in Hoarding and/or Squalor Related Structure Fire .....	57
Figure 12: Operation of Smoke Alarms in Hoarding and/or Squalor Related Fires.....	58
Figure 13: Alarm Level for Hoarding and/or Squalor Related Fires .....	59
Figure 14: Alarm Level for Hoarding and/or Squalor Fires from 2012 Hoarding Study .....	59
Figure 15: Number of Appliances for Hoarding and/or Squalor Related Fires .....	60
Figure 16: Number of Pumpers for Hoarding and/or Squalor Related Fires .....	61
Figure 17: Number of Personnel Attending Hoarding and/or Squalor Related Fires .....	62
Figure 18: Containment of Hoarding and/or Squalor Related Structure Fires .....	63
Figure 19: Estimated Dollar Loss for Hoarding and/or Squalor Related Fires.....	64
Figure 20: Distribution of Incident Type of Hoarding and/or Squalor Related Incidents .....	65
Figure 21: Distribution of Hoarding Incidents in 2012 Hoarding Study .....	66
Figure 22: Age Distribution of All Hoarding and/or Squalor Related Incidents .....	67
Figure 23: Age Distribution of Hoarding Related Fires from 2009 (left) and 2012 (right) Hoarding Studies.....	67
Figure 24: Gender Distribution of All Hoarding and/or Squalor Related Incidents.....	68
Figure 25: Property Types of All Hoarding and/or Squalor Related Residences .....	69
Figure 26: Property Types of Hoarding Households from 2012 Hoarding Study .....	70
Figure 27: Property Tenure of Hoarding and/or Squalor Related Residences.....	71
Figure 28: Property Tenure of Hoarding Residences from 2012 Hoarding Study .....	71
Figure 29: Hoarding and/or Squalor Related Incidents within the Metropolitan District .....	72
Figure 30: Seasonal Distribution of All Hoarding and/or Squalor Related Incidents .....	73
Figure 31: Seasonal Distribution of Hoarding Related Fires from 2012 Hoarding Study.....	74
Figure 32: Time of Day of Hoarding and/or Squalor Related Incidents.....	75
Figure 33: Time of Day of Hoarding Related Incidents from 2012 Hoarding Study.....	75
Figure 34: Time of Day of Hoarding and/or Squalor Related Fires .....	76
Figure 35: Comparison of Incident Occurrence Rates.....	76
Figure 36: Time Period Breakdown of Incident Occurrence Rate .....	76

## Acronym Reference Table

<b>Acronym</b>	<b>Meaning</b>
ADHD	Attention Deficit Hyperactivity Disorder
AIRS	Australian Incident Reporting System
CBT	Cognitive Behaviour Therapy
CFA	Country Fire Authority
CIR	Clutter Image Rating
CPR	Cardiopulmonary Resuscitation
DHS	Department of Human Services
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
ECCS	Environmental Cleanliness and Clutter Scale
EMR	Emergency Medical Response
ERG	Emergency Response Guidebook
FIA	Fire Investigation and Analysis
HNS	Hoarding Notification System
LCRS	Living Conditions Rating Scale
LGA	Local Government Area
LPG	Liquefied Petroleum Gas
OCD	Obsessive Compulsive Disorder
PPE	Personal Protection Equipment
MD	Metropolitan District
MFB	Metropolitan Fire and Emergency Services Board
SSRIs	Selective Serotonin Reuptake Inhibitors
STO	Station Turn Out
The Act	The Metropolitan Fire Brigades Act 1958
WPI	Worcester Polytechnic Institute

## **Executive Summary**

Hoarding is a highly misunderstood, complex psychological condition that affects millions of people worldwide. It is defined as “the persistent accumulation of, and lack of ability to relinquish, large numbers of objects or living animals, resulting in extreme clutter in or around premises” and largely involves two distinct characteristics: actively acquiring unnecessary possessions and difficulty discarding. While it has been recently included in the *Diagnostic Statistic Manual of Mental Disorders* (DSM-5) which provides standard criteria to classify mental disorders internationally, knowledge, practice, and treatment will require time to develop. Squalor is considered “an unsanitary living environment that has arisen from extreme and/or prolonged neglect” (Victoria Dept. of Health, 2012). It is important to note that hoarding and squalor are singular, and although they can coexist, hoarding is just one of the pathways that may lead to squalor. Neither hoarding nor squalor are specific to any demographic characteristics and can affect all ages, genders, nationalities, and social classes.

Hoarding and squalor have emerged as significant fire and health risks over the last few years. Large amounts of hoarded items, blocked and narrowed pathways, unorthodox practices, and squalid living environments combine to create dangerous environments for occupants, neighbours, and responding personnel in the event of an emergency. The high risk of hoarding is evident in that hoarding related fire incidents accounted for 24% of all preventable residential fire fatalities in the Metropolitan District (MD) from 1999 to 2009 (Lucini, Monk, & Szlatenyi, 2009).

MFB has identified a significant increase in reported hoarding and/or squalor related incidents, which provides an ongoing imperative to understand and contribute to organisational, local and international knowledge on hoarding and squalor. The previous two hoarding studies conducted by Worcester Polytechnic Institute (WPI) have provided an understanding of the dangers and extent of these issues and contributed to the increased capacity for relevant programs and agencies to respond in a sustainable way.

The aim of this study was to establish a current rate of the prevalence of hoarding and squalor in emergency incidents attended by MFB and to promote a collaborative approach to reduce their impact on the safety, health, and wellbeing of affected people. This study analysed all identifiable hoarding and squalor related incidents in the MD to determine the rate, prevalence, severity, and demographics of incidents since the previous 2012 hoarding study.

Incidents were identified, and data was extracted from various MFB sources, including the Australian Incident Reporting System (AIRS) reports, post incident reports by the Fire Investigation and Analysis (FIA) department, Residential Risk Referrals, and informal referrals.

This study, in conjunction with the two previous hoarding studies, will continue to contribute to an increased understanding of hoarding and squalor. The conclusions developed in this study will progress the work of key community stakeholders, MFB, and other fire services in Australia and internationally.

## **Research Methods**

We used two main methods for identifying hoarding and/or squalor incidents from 4 April 2012 to 3 April 2014 (Study Period). The first was a search through internal notifications from firefighters to Community Resilience, and the second was an extensive keyword search through AIRS. In addition, we completed an address search in AIRS of confirmed hoarding and/or squalor residences to find repeat incidents at the same address.

Our first step was to find all hoarding and/or squalor related referrals from the Study Period by reading through all MFB's notifications and referrals about hoarding and/or squalor incidents. Referrals include exchanges between firefighters and Community Resilience and with external agencies, and many include information, and physical and/or other disabilities that may increase fire risk.

After reading and identifying all hoarding and/or squalor related notifications and referrals, we searched through all MFB AIRS reports for the Study Period. All AIRS reports were provided in a spreadsheet. This spreadsheet contained approximately 40,000 incidents including structure fires, non-structure fires, emergency medical responses, false alarms, and other incidents such as lock-ins and welfare checks. We used this spreadsheet to search for all the hoarding and squalor keywords listed in Appendix B.

Once a database of confirmed hoarding and/or squalor incidents was created from the first two incident identifying methods, the team then searched AIRS using each address in order to identify recurring incidents at the same address within the Study Period. Because hoarding and/or squalor are chronic and progressive, it was hypothesised that any additional incident occurring at an identified residence would also be a hoarding and/or squalor related incident. By

searching for known addresses, the team was able to identify additional hoarding and/or squalor incidents that were not found with the previous two identifying methods.

Once all incidents were identified, we analysed specific variables to obtain an accurate profile of hoarding and/or squalor incidents and to quantify the severity and prevalence of these issues. Consideration of variables such as type of incident, cause of fire, point of origin, location, and property type are critical in comprehending hoarding and/or squalor incidents and affected people. This analysis allowed the team to confirm and expand upon the results of the 2009 and 2012 hoarding studies.

## **Findings and Conclusions**

This study showed that nearly 80 per cent of Local Government Areas (LGA) in the MD had at least one hoarding and/or squalor incident occur within its boundaries. This confirms that hoarding and/or squalor related incidents are not confined or common to one suburb or even one LGA and occur anywhere in the MD.

This study also identified that while the majority of hoarding related fires originated inside a residence, fires occurring outside the home within the boundary of a property have significantly increased from one non-structure fire in three years (2012 study) to 14 non-structure fires in two years (2014 study). While this may be attributable to the overall increased rate of reporting, this information is a concern for local government who have responsibility in the areas of fire prevention and local laws. An increase in fires involving hoarding in the front or rear yard of a residential property may indicate a previously unreported risk.

This study also identified MFB's attendance at seven hoarding and/or squalor related incidents involving a deceased person. While the previous two studies have only identified fire related fatalities, only one of the deaths in our study involved a fire. This information may provide the basis for more research to better understand the circumstances and any interventions that could have contributed to a different outcome.

The results from this study also confirmed the findings of the 2012 study in that the majority of incidents occurred in owner-occupied stand-alone homes. The remainder of the property types and tenures were fairly evenly distributed between apartments and semidetached homes, and public housing and private rental respectively. This distribution indicates that any home with hoarding and/or squalor present is subject to the same risks.

It was shown in this study that the highest rate of fires occurred during the day and evening hours. This finding contrasted with the results from the 2012 study which showed that the highest rate of fires occurred in the morning to mid-day and evening hours. These results indicate that hoarding and/or squalor related fires can occur at any time of the day.

It was found that MFB has been able to increase its containment rate of hoarding fires to the room of origin from 40% to 70% over the past five years. However, the rate observed in this study is still 20% less than MFB's overall containment rate for residential fires. This is likely due to the additional challenges hoarding fires present to firefighters such as reduced access and high fuel load.

The incident identification rate has doubled since the 2012 study. In the first six months of this study, an incident occurred approximately every nine days. In the last six months, the incident rate has increased to approximately one incident every four days.

Reasons for this increase could be attributed to increased engagement with firefighters. MFB has been actively promoting awareness of hoarding and squalor to firefighters to increase their understanding of the associated risks and complications of hoarding and/or squalor incidents and to stress the importance of reporting these incidents. Another possible reason for increased incident rate in this study may be due to the broader search area, which included false alarms and multiple incidents at the same address. From this information, it is possible to conclude that either the incident rate is increasing or incident reporting is increasing.

According to the Department of Planning and Community Development's report *Victoria in Future 2012*, the average age in Melbourne is steadily increasing and people on average are living longer. As reinforced by this study, the majority of people identified in hoarding and/or squalor incidents are 65 years or older. The convergence of these trends may be contributing currently and is certainly expected to contribute in the future.

Multiple incidents occurred at approximately one out of every six hoarding and/or squalor residences identified in this study. Having multiple incidents at a hoarding and/or squalor residence demonstrates the ongoing risk to occupants and the need to appropriately refer and support affected people.



## **Recommendations**

MFB has developed research, policy, and practice and engaged external stakeholders, but gaps still exist in internal and external knowledge and practices. The following recommendations are provided to support increased reporting, knowledge, and shared practice.

### ***Recommendation #1:***

MFB continue to promote the Hoarding Notification System (HNS) with external agencies as a proactive and measurable way to increase the fire safety of the occupants, neighbors, and responding firefighters. Engaging people affected by hoarding for consent to refer may also raise individual awareness of the inherent fire risks of hoarding in the home.

### ***Recommendation #2:***

Both previous WPI/MFB hoarding studies have recommended a change to AIRS such as the inclusion of a drop down box with the Clutter Image Rating (CIR) scale in the description field of AIRS to increase reporting of hoarding incidents. This study recommends training and education for firefighters about hoarding and squalor to increase reporting of these incidents in AIRS in all states and territories.

Changes to AIRS not only requires agreement by all states and territories but also evidence to support an imperative for change. At the time of compiling this study, MFB is the only fire service in Australia to actively collect data and develop research related to hoarding and/or squalor related incidents. This can be attributed in part to the more recent emergence of the relationship between hoarding, squalor, and risk as well as the capacity of fire services to capture and collect more detailed situational information about individual incidents. With hoarding alone predicted to affect between three to five per cent of the general population and its risk status confirmed by this study and the previous two WPI/MFB studies, a case has been established for fire services to consider an integrated multi-agency initiative to measure and monitor prevalence in all jurisdictions. It is recommended that fire services develop a package of information for firefighters about hoarding and squalor and their associated risks. This, combined with simple tools and language through which they can be described, and the recommendation it be recorded in the description field of AIRS, will provide a more accurate incident rate. To

maximise efficiencies in delivery and consistency of the information to and for firefighters, consideration should be given to developing this information electronically.

If increased reporting does occur and provides a basis upon which to consider the inclusion of drop down boxes in the description field of AIRS for hoarding and squalor, further development is required. While CIR has been previously suggested for inclusion in a drop down box for hoarding, no similar visual tool exists to identify squalor. Although hoarding can be simply identified through volume, squalor which may or may not also include hoarding, has a range of different features. These may be best identified through a drop down box with a series of word prompts such as *rotting*, *organic matter*, or *unsanitary living environment*.

Our recommendations are that:

- MFB and fire services in other jurisdictions work in collaboration to develop information for firefighters about:
  - Hoarding, squalor, and risk
  - How to identify and describe hoarding and squalor
  - How to report this via the AIRS description box
  - Commit to a roll out of this information to firefighters in all jurisdictions
- AIRS is monitored to identify reporting of hoarding and squalor incidents in the description box of AIRS
- If reporting is increased in AIRS, consideration be given to providing drop down boxes to denote hoarding and/or squalor
- Fire services in other countries seeking to quantify the rate of hoarding incidents in their jurisdictions engage firefighters directly with information and language to describe hoarding and/or squalor and provide a clear pathway for it to be reported within their own fire service.

***Recommendation #3:***

MFB set up a process through which AIRS data related to residential fires in the MD is searched for the key words used to describe hoarding and squalor. The regular collection of this

information will provide MFB with a current and consistent ability to measure the incident rate and types of incidents involving hoarding and/or squalor.

***Recommendation #4:***

MFB continue to seek opportunities in which to engage key stakeholders to further develop shared practice and responses. The engagement of key stakeholders will provide information, industry best practices, and the most efficient interagency response.

## Chapter 1: Introduction

Hoarding is a highly misunderstood, complex psychological condition that affects millions of people worldwide. It is defined as “the persistent accumulation of, and lack of ability to relinquish, large numbers of objects or living animals, resulting in extreme clutter in or around premises” and largely involves two distinct characteristics: actively acquiring unnecessary possessions and difficulty discarding. While it has been recently included in the *Diagnostic Statistic Manual of Mental Disorders* (DSM-5) which provides standard criteria to classify mental disorders internationally, knowledge, practice, and treatment will require time to develop. Squalor is considered “an unsanitary living environment that has arisen from extreme and/or prolonged neglect” (Victoria Dept. of Health, 2012). It is important to note that hoarding and squalor are singular, and although they can coexist, hoarding is just one of the pathways that may lead to squalor. Neither hoarding nor squalor are specific to any demographic characteristics and can affect all ages, genders, nationalities, and social classes.

Hoarding and squalor have emerged as significant fire and health risks over the last few years. Large amounts of hoarded items, blocked and narrowed pathways, unorthodox practices, and squalid living environments combine to create dangerous environments for occupants, neighbours, and responding personnel in the event of an emergency. The high risk of hoarding is evident in that hoarding related fire incidents accounted for 24% of all preventable residential fire fatalities in the Metropolitan District (MD) from 1999 to 2009 (Lucini, Monk, & Szlatenyi, 2009).

The Metropolitan Fire and Emergency Services Board (MFB) Community Resilience department has been actively investigating and addressing the inherent risks of hoarding and squalor. Previous research conducted internally by MFB and externally on a worldwide basis clearly identifies a higher rate of hoarding and squalor among older adults, making the ageing population a related concern. With no single treatment available that is effective in all cases, affected people require constant and active support through a range of assessment, treatment, and program providers.

MFB has identified a significant increase in reported hoarding and squalor related incidents, which provides an ongoing imperative to understand and contribute to organisational, local, and international knowledge on hoarding and squalor. The previous two hoarding studies conducted by Worcester Polytechnic Institute (WPI) have provided an understanding of the

dangers and extent of these issues and contributed to the increased capacity for relevant programs and agencies to develop sustainable responses.

To address the increasing rate of reported incidents, MFB has developed a range of organisational responses to actively engage operational personnel and external stakeholders. These responses include refining and improving the methods through which firefighters can refer affected people identified through emergency response. Despite these advances in reporting and engaging people affected, many challenges still remain in creating a collaborative approach with external stakeholders in response to hoarding and squalor. In addition to inconsistent practice and knowledge, many agencies may not have program capacity to respond.

The aim of this study was to establish a current rate of the prevalence of hoarding and squalor in emergency incidents attended by MFB and to promote a collaborative approach to reduce their impact on the safety, health, and wellbeing of affected people. This study analysed all identifiable hoarding and squalor related incidents in the MD to determine the rate, prevalence, severity, and demographics of incidents since the previous 2012 hoarding study. Incidents were identified, and data was extracted from various MFB sources, including the Australian Incident Reporting System (AIRS) reports, post incident reports by the Fire Investigation and Analysis (FIA) department, Residential Risk Referrals, and informal referrals.

This study, in conjunction with the two previous hoarding studies, will continue to contribute to an increased understanding of hoarding and squalor. The conclusions developed in this study will progress the work of key community stakeholders, MFB, and other fire services in Australia and internationally.

## Chapter 2: Background

The impacts of hoarding and squalor can include health, wellbeing, and safety. Of primary concern to MFB is the fire risk which is significant with the common and primary risk features being blocked egress and access and an abnormally high fuel load. This chapter will focus on three main areas: hoarding and squalor, their inherent risks during emergency responses, and MFB's current initiatives to collaboratively address hoarding and/or squalor related incidents.

### 2.1 Compulsive Hoarding

Compulsive hoarding is a psychological condition. Its three distinguishable characteristics, as defined by Frost and Hartl (1996), are:

- The acquisition of, and failure to discard, a large number of possessions that appear to be useless or of limited value.
- Living spaces sufficiently cluttered so as to preclude activities for which those spaces were designed.
- Significant distress or impairment in functioning caused by the hoarding.

In the *Discussion paper hoarding and squalor*, the Ageing and Aged Care Branch of the Department of Health in Victoria, Australia defines hoarding as “the persistent accumulation of, and lack of ability to relinquish, large numbers of objects or living animals, resulting in extreme clutter in or around premises” (Victoria Dept. of Health, 2012).

The first known reference of hoarding dates back to the beginning of the 14<sup>th</sup> century when Dante Alighieri referenced hoarding in his epic poem *The Divine Comedy* (International OCD Foundation, 2013). Since then, hoarding has gradually emerged from being a relatively hidden problem to being recognized on an international scale, finally being classified as its own disorder in 2013 by the *Diagnostic and Statistics Manual of Mental Disorders (DSM-5)* (American Psychiatric Association, 2013). One of the most famous and excessive cases of hoarding took place in New York City in the 1940s, involving the two Collyer Brothers. The two brothers had managed to acquire over a 170 tons of possessions including fourteen pianos, 25,000 books, and years of old newspapers before their piles of rubbish collapsed upon them. Due to the excessive clutter in their mansion, it took authorities three weeks to find both of their

bodies (Frost & Steketee, 2010). Hoarding is a serious problem around the world predicted to affect three to five per cent of the population according to The Swinburne University of Technology Brain Sciences in Victoria. This translates to 400,000 to one million Australians affected by hoarding (Kyrios, 2012), with 170,000 to 290,000 Victorians predicted to be affected.

### **2.1.1 Causes of Compulsive Hoarding**

Compulsive hoarding can arise from a wide range of environmental, hereditary, and/or psychological factors. Until recently, hoarding was thought to be caused by Obsessive Compulsive Disorder (OCD) (Tolin, 2011). Current information now indicates that only about 20% of people affected by compulsive hoarding are also affected by OCD. Nevertheless, the majority of people affected by hoarding have a comorbid disorder. Mood or anxiety disorders occur in about 75% of people affected by hoarding with almost 50% of people suffering from depression. Of the other 25% with mood or anxiety disorders, social phobia and generalized anxiety disorder are the next two most common comorbid disorders. Compulsive hoarding has been shown to be genetic or familial, with approximately 50% of people affected by hoarding, having a relative also affected. Hoarding can also originate as a result of a traumatic event (American Psychiatric Association, 2013). Recent research indicates a significant number of people may hoard due to an adult form of attention deficit hyperactivity disorder (International OCD Foundation, 2013).

People compulsively hoard for a variety of personalized reasons based on their past and present issues. Attachment deficits, abandonment issues, and the lack of a loving family connection can cause people affected by hoarding to create a strong emotional connection with their possessions. Having a sense of control can help them overcome feelings of vulnerability. Their items can also serve as a buffer between them and their relationship issues, self-doubt, and loss and give them a strong sense of security (Victoria Dept. of Health, 2012). For example, the affected person might go shopping every time they feel bad about themselves which results in the purchase of an item they may already have, in excess of what they need and can reasonably expect to never use. This is best illustrated in Frost and Harlt's original definition of hoarding, as the large accumulation of items which appear to have no apparent use or purpose.

### 2.1.2 Consequences of Compulsive Hoarding

Compulsive hoarding interferes with a person's daily living and the ability to use rooms for their intended purpose. The impact of the accumulated items often results in difficulty or an inability to perform daily activities most of us take for granted. This can include cooking in the kitchen, sitting at a table, sleeping in a bed, using a shower and even accessing entire rooms or areas of their home. Even if they can access every area of their home, navigating through their own home is often difficult due to blocked exits and narrow pathways.

More importantly hoarding also results in an increased risk for the occupants, as affected people are more likely to put their attachment to their items before a range of their own personal needs and safety. Many of the most commonly hoarded items are highly combustible as seen in Figure 1 below.

Description	Rank	% 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%
Papers, pens, gifts	9	58%
Stationary old things	10	56%

**Figure 1: Most Commonly Hoarded Items**

(Victoria Dept. of Health, 2012)

Items cluttered around stove tops, cooking appliances, electrical outlets, power boards, extension leads, heat sources, and open flames significantly increase the risk of fire due the proximity of the accumulated items to ignition sources. These and other fixed and portable appliances also cannot often be operated safely in accordance with the manufacturer's instructions.



In many ways this defines the intersection between the attachment to items and risk, accumulated items and often highly combustible items stored on or near ignition sources. In the event of a breakdown or malfunction of a fixed appliance like a stove, heater or the actual electrical or gas supply, an affected person may be unwilling to allow a tradesperson into their home to repair the broken item. This results in ad hoc and dangerous practices just to cook or stay warm. The 2012 study found that 59% of hoarding fires were due to electricity, cooking, and heat/open flame (Colpas, de Zulueta, & Pappas, 2012).

Financial problems are also a cause for concern for many people affected by hoarding. Approximately two out of three people affected by hoarding shop excessively, often spending money they cannot afford to spend. The pleasure from shopping dissipates once they realize what they have done and they feel depressed again. It can be a vicious cycle of depression, pleasure, and then depression again (Frost & Steketee, 2010).

The consequences of hoarding such as the impact on daily living, increased risks, and financial problems, can place unnecessary stress on affected people and their relationships with their partners or family. People affected by hoarding are commonly aware of its impact and understand their problem, yet they let their items control their lives and affect their relationships. They will often go out of their way to meet with people away from their own home to prevent people from learning about their problem often because they are embarrassed about it (Lucini et al, 2009). When an affected person lives with a family, all the occupants of the home share the same stress and increased risk status, making it a quality of life issue.

### **2.1.3 Measuring Compulsive Hoarding**

The standardized visual tool developed to evaluate the scale of clutter in a room, the Clutter Image Rating (CIR) was created by Frost, Steketee, Tolin, and Renaud in 2008 (Colpas et al, 2012). The CIR, which is increasingly used worldwide, contains a series of nine pictures of a room with increasing amounts of clutter in each picture. Any room with a scale of five or above indicates that hoarding is present (Victoria Dept. of Health, 2012) with nine being the highest. The CIR provides an independent measure to assess a level of hoarding in a simple and visual way.

#### **2.1.4 Current Approaches to Treating Compulsive Hoarding**

There is no single treatment that works for all affected people. People hoard for highly-personalized reasons, so building a rapport is pivotal to developing a successful treatment (Mogan, 2009). Best practice involves the use of Cognitive Behavior Therapy (CBT) combined with the reduction of risks in the household. In CBT, it is important to increase affected people's motivation and confidence in discarding, and to challenge their beliefs and emotional attachments about saving. CBT focuses on understanding the reasons behind why people hoard and how they view their possessions and their environment (Victoria Dept. of Health, 2012). Therapists work with affected people in order to gain a connection and to reduce stress by never forcibly discarding their clients' possessions. Instead, they encourage those affected to reevaluate their need for their possessions and to help them slowly discard unnecessary items. Therapists also work to reduce the urge to keep new items (National Health Service UK, 2013).

Forced removal is likely to produce a resistant or hostile response. It not only threatens the current treatment, but also hinders effective treatment in the future. Research in Australia and internationally has established that forced removal is most likely to result in replacement of the items within a short space of time.

Besides CBT, medication and group therapy can also be effective. Selective serotonin reuptake inhibitors, or SSRIs, are available but only effectively treat about one out of three people affected by hoarding (Victoria Dept. of Health, 2012). Of those who respond positively to SSRIs, most are affected by OCD. This connection establishes that medication may be more effective to those with OCD who exhibit signs of hoarding, which is why the DSM-5 recommends a diagnosis of OCD instead of hoarding disorder when hoarding tendencies result as a consequence of OCD (American Psychiatric Association).

MFB developed their risk reduction advice to align with treatment and practices most likely to result in a positive long term outcome. In addition to installing smoke alarms and unblocking entrances and exits, the risk reduction advice is intended to return functional capacity to areas of the home. This included simple practical advice such as to identify where cooking and meal prep occur and to clear one metre of space around this area. Working to address the risks and reduce the fuel load in the home is an evidence based approach designed to prioritize the highest level of risk first instead of forced large scale removal. (MFB, 2014b).

## **2.2 Squalor**

Unlike hoarding, which is a psychological condition, squalor refers to the actual living conditions of a residence. In the *Discussion paper hoarding and squalor*, the Ageing and Aged Care Branch of the Department of Health describes squalor as “an unsanitary living environment that has arisen from extreme and/or prolonged neglect, and poses substantial health and safety risks to people or animals residing in the affected premises, as well as others in the community” (Victoria Dept. of Health, 2012). Recent research states that up to 1.5 out of 1000 elderly persons live in squalor (Victoria Dept. of Health, 2012). People affected by squalor often live alone, and this lack of support may increase their inability to maintain a clean and safe living environment. Squalor can exist in the form of dry squalor or wet squalor. Dry squalor exists without the presence of decay and is characterized by the uncleanliness and poor maintenance of the residence. Wet squalor is often characterized by decay and foul odors from the stockpiling of household garbage, rotting foodstuffs, infestation of vermin and pests, animal waste from pets, and makeshift arrangements for human waste disposal.

### **2.2.1 Causes of Squalor**

Squalor is an end-state arising either from compulsive hoarding or passive degeneration, which is a passive failure to adequately maintain the environment. Dry squalor most commonly arises from compulsive hoarding. The causes of compulsive hoarding are described in Section 2.1.1. Wet squalor, on the other hand, can be attributed to passive degeneration, which manifests in the loss of capacity to maintain the state of the domestic environment (Personal Communication, Steve Macfarlane, 2014). People affected by passive degeneration do not actively acquire objects like people affected by compulsive hoarding. Instead, they fail to discard items properly. This failure lies in the observation that people living in squalor are unaware of their problem and unaffected by the environment around them. This lack of awareness can lead to the disrepair of necessary facilities. For example, makeshift arrangements for human waste disposal can occur due to the loss of access to, or the inability to maintain a functional toilet.

Passive degeneration has been shown to be linked to frontal lobe impairment. The frontal lobe of the brain is responsible for insight, problem solving, risk assessment, and other executive functions. Frontal lobe impairment can result from a number of factors including alcohol abuse, dementia, and depression. A recent study by Prof. Macfarlane, Associate Professor and Director

of Aged Psychiatry at Caulfield Hospital, to research the neuropsychological characteristics of 69 people affected by squalor demonstrated that, regardless of whether squalor arose via compulsive hoarding or passive degeneration, the presence of squalor is linked to frontal lobe impairment (Macfarlane, 2013).

### **2.2.2 Consequences of Squalor**

People living in dry squalor that arose from compulsive hoarding suffer from the compulsive hoarding related consequences previously mentioned in Section 2.1.2. The lack of cleanliness combined with numerous items creates the risk for dry squalor to evolve into wet squalor if hoarded items come into contact with water, organic matter, or other substances that can cause decay.

People living in wet squalor are likely to experience dangerous health risks from extended exposure to rotting food, animal waste, human waste, and other biohazards. Due to their lack of insight, they will not actively seek treatment. Consequently by the time they are admitted into acute care, they may present with advanced pathology resulting from infection, inhalation of particulates from decomposing matter in the air, or other biohazards. Almost half die after admission (Misiaszek, n.d).

### **2.2.3 Measuring Squalor**

There are two scales that have been developed to evaluate the scale of squalor in a residence, the Environmental Cleanliness and Clutter Scale (ECCS) in 2009 by Snowdon and Halliday and the Living Conditions Rating Scale (LCRS) in 1996 by Samios. The ECCS has been found to be the more reliable of the two, but both systems are much more complicated than the CIR (Banerjee, Halliday, & Snowdon, 2012).

In *Severe Domestic Squalor*, Snowdon, Halliday, and Banerjee described a simple system that divides squalor into four degrees.

- First degree squalor – Small piles of rubbish begin to develop and disorganization begins to occur and inconvenience the occupants of a residence.
- Second degree squalor – Piles of rubbish begin to cover items in the residence and interfere with the use of facilities.

- Third degree squalor – Incorporates the first two degrees, but also includes rotting food and animal waste. Necessary repairs are left unaddressed, because the occupant is either unwilling to let a tradesperson enter their residence or are just unaware of the issue.
- Fourth degree – Incorporates the previous three degrees and also includes human waste that is not properly disposed of in a toilet.

#### **2.2.4 Current Approaches to Treating Squalor**

There are different pathways to treatment for squalor that arises from passive degeneration versus squalor that arises from compulsive hoarding. When treating people living in squalor affected by compulsive hoarding, it is necessary to approach treatment in the same method that stand alone compulsive hoarding would be addressed as seen in Section 2.1.4. It is necessary to understand the individuals have personalized reasons for hoarding, and to develop a treatment plan focused on their personalized reasons, involving SSRIs, cognitive behavior therapy, and/or group therapy.

Successful management of squalor arising from passive degeneration tends to require a more administrative approach, as the person’s lack of insight makes “treatment,” as such, problematic. The residence must be cleaned up to address health and safety risks with consent from the affected person or, if such consent cannot be obtained, via proxy consent from a legally appointed guardian. If the residence is cleaned, the person may be able to remain at home, as long as services visit and the residence can continue to be properly maintained. Since many people affected by squalor can no longer take care of themselves, however, moving them into a structured environment where their needs are met, like assisted living, can be a better option. This type of living arrangement can ensure that their health and environment are properly maintained (Macfarlane, 2014).

#### **2.3 Children of Hoarding and Squalor Households**

Hoarding and/or squalor affects people of all backgrounds and ages including children. This is significant because like older people, young children are a high fire risk group. To address this, MFB has developed and delivers a fire safety program to children in primary schools. However, the information is focused on simple key messages because the fire safety of

children is ultimately the responsibility of adults in the home. Of concern is that the previous hoarding studies have confirmed that adults in affected homes are less likely to comply with state smoke alarm legislation and more likely to engage in high fire risk practices. This combined with other risk factors make it less likely to be able to safely self-evacuate in the event of a fire. For children, especially the very young, these factors represent an unacceptably high risk. This study can confirm that children have been identified in hoarding and squalor related emergency incidents attended by MFB. Three incidents were identified that occurred in homes where there were children living. While there is no record of children having died in a hoarding related fire in Victoria, at least one near miss has been identified in the last two years involving more than one child. In 2007 in Western Australia, a mother and two sons aged under 10 all died in a fire. After investigation of the home, it was determined that the household had hoarded items throughout the home and also that there were no working smoke alarms (News.com.au, 2012).

For children living with hoarding, fire is only one of the more complex and significant risks as hoarding and/or squalor is likely to impact their health, safety, wellbeing, and development. In the document provided by the Department of Health called the *Hoarding and Squalor a Practical Resource for Service Providers* (2013), it states evidence to support raised welfare concerns for a child, which include the following:

- Is there a clean and accessible place to eat?
- Are there safe play areas inside and outside the house?
- Are there clean and accessible bedrooms, and access to healthy and fresh food and clean running water?
- Is there a clean and accessible toileting and personal washing room?
- Are there secure and safe living environments (protection from the weather and strangers, smoke detectors installed, warmth)?
- Are the children able to bring friends home to visit or stay, watch TV or play comfortably?

Examination of hoarding and/or squalor events attending by MFB consistently identifies these features being deficient in hoarding and squalor related homes.

Over the last year two incidents involving the deaths of a child in hoarding and squalor have been widely reported in the national press. These include the death of a three year old child in Brisbane in which the living conditions within this home were considered as “squalid” and her injuries remain “unheeded”, ultimately becoming catastrophic (Atfield, 2013).

In Melbourne, the death of a five year old boy resulting from an infection from a cut to his foot from an open can was also widely reported when his father plead guilty to neglect charges in the local Magistrates Court. The cut became infected and the child did not receive appropriate medical treatment. Examination of the photos in the media reveals a home not only affected by squalor but also hoarding. In press coverage, the police presented in their brief of evidence that the “mum admitted to police that her family had been living in sheer and utter filth”. (Deery, 2014). It was also reported that Bernie Geary, the Principal Commissioner of the Mission for Children and Young People, investigated the circumstances surrounding the death of this child.

The negative impact of hoarding on children is further evidenced by a website called the Children of Hoarders. This was one of the first hoarding dedicated website established worldwide to “improve the lives of children from hoarded homes” (Children of Hoarders, 2014). Stories and information on the site clearly describe in a very personal way the issues facing children living in homes affected by hoarding with or without squalor. With the stated aims of the website being to raise awareness, provide information, increase practical support and advocate for public policies to address the needs of children of hoarders, it is evident that the effect of hoarding on children who grow up in these homes extends beyond childhood.

## **2.4 MFB Responses to the Risks of Hoarding and Squalor**

When firefighters respond to an incident in a home with hoarding and/or squalor, they are confronted by a multitude of risks which can vary significantly depending on the conditions inside and outside a home as well as the type of incident. While the conditions may sometimes be visible from outside, they are often not apparent until firefighters attempt to or gain access.

### **2.4.1 Hoarding Related Risks**

In a hoarding household, floor space may be limited or entirely absent. Unstable stacks of precariously balanced or densely stacked items can form impenetrable walls and/or new surface

areas in place of the actual floor. While the occupants may be able to carefully negotiate their way through their home with varying levels of difficulty on a day to day basis, this challenge is significantly increased in an emergency. The accumulated items will impede internal pathways, doorways, and exits. This impediment combined with smoke will severely impact the ability of the occupant to self-evacuate. These challenges will increase the need for responding firefighters to conduct search and rescue, but the issues that impact the occupants' ability to escape safely will also adversely affect access for responding firefighters.

Previous hoarding related fires attended by MFB demonstrate that in some instances access through a front or rear door and/or windows is not possible. Once inside, another major risk to firefighters is the effect the accumulated items will have on their ability to move throughout a residence in the event of an emergency. A firefighter wearing personal protection equipment (PPE) including breathing apparatus is much larger than an average person. These unstable stacks may be prone to collapse and fall onto responding firefighters, and negotiating these types of residences in a critical time frame can also increase the risk of trips and falls for firefighters. Figure 2 and Figure 3 provide examples of access issues for firefighters responding to hoarding related incidents.



**Figure 2: Example of Difficult Access to Interior of Home**





**Figure 3: Example of Difficult Access to Interior Room**

Firefighters may also have difficulty locating occupants inside a home with hoarding. In a recent incident not involving a fire and reduced visibility, multiple unsuccessful attempts were made to find a victim in their home. It was only after the use of a thermal imaging camera that the victim was successfully found amongst the accumulated items. These issues are not unique to the MD in terms of hoarding related incidents. In Shrewsbury, Massachusetts, USA, firefighters responding to a fire took 30 minutes to find the occupant amongst the hoarded items and by the time they were able to locate her, she had already perished due to fire related injuries (Flanagan, personal communication, 2014).

This study and the previous two WPI/MFB hoarding studies confirm that containment of the fire to room of origin is much less likely in a hoarding fire than other residential fires. If a fire is not contained to the room of origin, the aim of firefighters is to contain it to structure of origin to prevent the fire from spreading to neighboring homes or structures. It can be concluded that hoarding related fires are more likely to require additional resources to fight and contain the

fire than compared to other residential fires. It was found in the 2012 WPI/MFB hoarding study that 60% of fires were contained to the room of origin compared to MFB's overall average of 90% of fires contained to the room of origin. Research into hoarding fires has clearly determined that the higher fuel load which may include items with a low flashpoint such as newspapers, printed material, and clothing can cause the fire spread rapidly throughout the house.

As previously mentioned in Section 2.1.2, when utilities are disconnected or not functioning, it typically leads to occupants utilizing potentially dangerous and ad hoc alternatives instead of engaging a licensed trades person to repair the fault. When this involves gas and/or electricity supply and fixed appliances, these dysfunctional arrangements not only increase the likelihood of a fire but may also impact the safety of responding firefighters.

In some hoarding affected homes, the fire load is so large it can affect the structural integrity of the building even prior to a fire. MFB has been contacted by local governments who have identified properties affected in this way. Of concern is that in the event of a fire the water required to extinguish a fire will further increase the load on the structure. While no instance of this actually happening has been reported, it does indicate the level of potential risk particularly in multi-story dwellings and the complex risk assessment processes some hoarding related properties require.

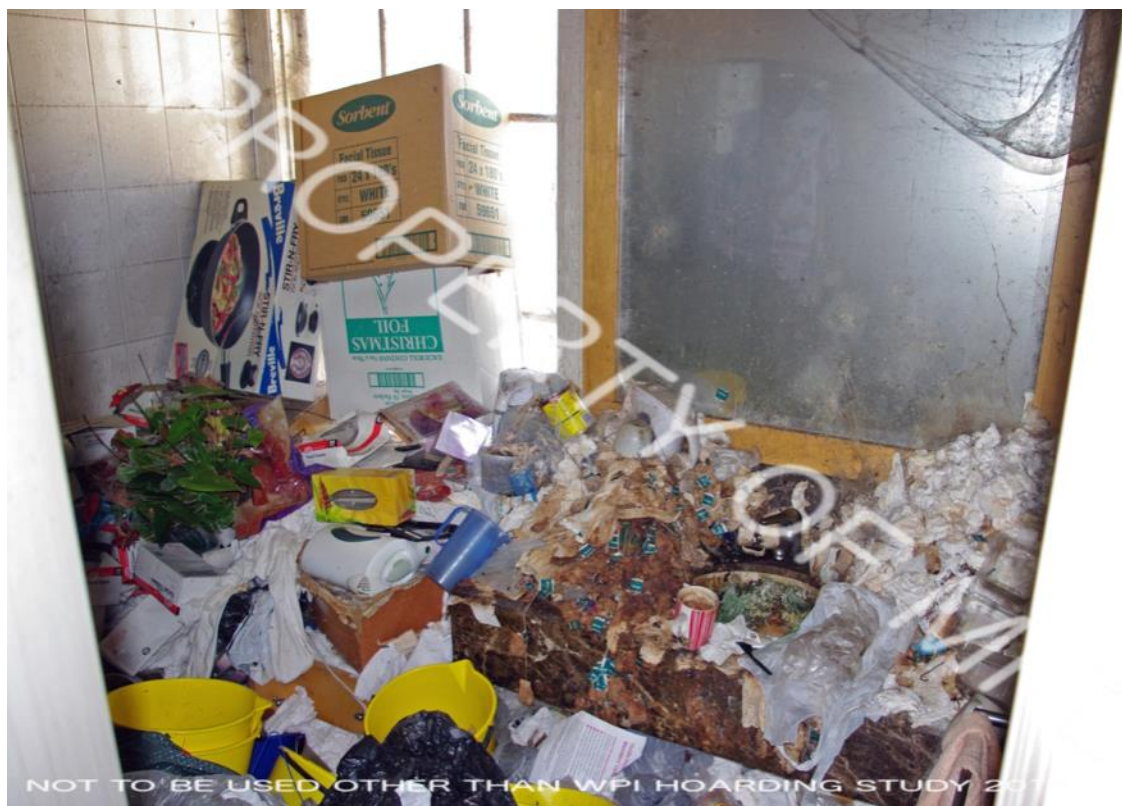
In one fire incident, which involved a fatality, the victim had stored a large accumulation of items inside the roof cavity. While responding firefighters were able to identify the fire had spread to the roof cavity, they did not expect that it would be full of burning items which then fell through the ceiling.

In addition to having difficulty fighting a fire, there is also increased difficulty for MFB personnel to perform an Emergency Medical Response (EMR). In 2014, MFB responded to an EMR incident for an unresponsive occupant. Hoarded material piled one to 1.2 meters high, made accessing the occupant in the rear bedroom difficult. Hoarding was evident in every room, with no pathways to navigate through the clutter; the entire floor of the residence was covered. Firefighters and Ambulance Victoria responders had to wade through this to gain access to the rear bedroom where they found the occupant deceased on the bed which was the only clear space in the room. Firefighters and emergency personnel cannot perform Cardiopulmonary

Resuscitation (CPR) on a bed. If the occupant had required CPR, emergency personnel would have had to remove the occupant from the residence before administering CPR.

#### **2.4.2 Squalor Related Risks (With or Without Hoarding)**

In some homes affected by squalor with or without hoarding, the unsanitary environment presents other risks. This can include stockpiling of household garbage, rotting food stuffs, infestation of vermin and pests, animal waste from pets, and loss of access to or inability to maintain a functioning toilet resulting in makeshift arrangements for human waste disposal. While these situations are less common than incidents involving hoarding alone, they cannot be predicted from outside a home or may not even be immediately apparent during the initial response to an emergency. Retrospective application of procedures related to working with biohazard increase risk for responding firefighters. Figure 4 below shows an example of squalor.



**Figure 4: Example of squalor**

## 2.5 Background to MFB Response to the Risk of Hoarding and Squalor

MFB has a dual purpose – emergency response and working preventatively with the community in relation to risk. The Metropolitan Fire Brigades Act 1958 (The Act) defined the roles and responsibilities of MFB. The Act states that, under section 7.1.a-b, the functions of the Board are to provide for fire suppression and fire prevention services in the MD and to provide for emergency prevention and response services in the metropolitan district. MFB works with a diverse community of three million people and billions of dollars in infrastructure within the MD which spans approximately 1,000 square kilometres. MFB responds to around 36,000 calls per year including fires, hazardous incidents, automatic alarm response, road accident rescue, emergency medical response, urban search and rescue, and marine response (MFB, 2014b). In addition to fire and emergency response, MFB drives systemic change to the built environment through reforms to building design, regulations and legislation, invests in research, and develops prevention programs that improve community safety and build resilience.

The role of MFB Community Resilience Department is to achieve the organisational vision of a safe and more resilient community. The *Community Resilience Strategy* focuses on three key strategies: building stronger communities, making firefighters safer, and working in partnership with other organisations for the best possible outcomes (MFB, 2014a). To achieve this, the department works to address risk with the broad community, at risk groups, and in the workplace. The range of activities and treatments include:

- The development of research and analysis in relation residential fire incidents, injuries and fatalities, new and emerging risk, external trends, etc.
- The development and delivery of evidence based information, advice, and safety messages
  - Policy and procedures
  - Safety information for hard copy and electronic media
  - Campaigns including Summer Fire Safety, Home Fire Safety, and Change Your Clock Change Your Smoke Alarm Battery
- Advocacy and lobbying for improved safety outcomes via external frameworks
  - Inclusion of home fire safety information into the national curriculum for care workers

- Recommendations via Coronial processes
- Participation in regulatory reviews at a state level i.e. Reviews of the state Rooming House Regulations and Supported Residential Services
- Development and management of community engagement programs
  - Primary schools programs, Fire Ed for Prep, Fire Ed for Upper Primary, and Fire Ed for Special Ed
  - Seniors Fire Safety for active older people
  - Juvenile Fire Awareness Intervention Program
  - Fit 2 Drive for young and novice drivers
  - Flames for English as second language education providers
  - Workplace Emergency Management
  - Participation at various state and local events and festivals using the SmokeBuster Bus
  - Hoarding Notification System

These diverse activities require Community Resilience to work with the community it serves and respond to the safety needs of the community in an “all hazards” approach. It was within the department’s responsibility to identify and address new and emerging risk that hoarding and later squalor were identified as significant issues. Developing evidence and an understanding of the external framework in which MFB could affect change was an underpinning feature of the organisational response to hoarding and squalor.

In 2007, over a period of three months, three preventable residential fire fatalities occurred in homes where hoarding was clearly evident. Preliminary analysis of these residential fire fatalities revealed that the items had no common demographic features, but that all of their homes rated five or above on the CIR. With this the only shared and common characteristic MFB committed resources to gather information and identify if the fatalities were reflective of a larger but unseen risk issue. Research confirmed hoarding and squalor as a risk issue and in response MFB developed a range of interlinked strategies which include the following and which will be described in further detail in the following sections of the report:

- Research and evidence
- Engagement of internal and external stakeholders

- Risk reduction advice for affected people, their families, and support agencies
- Risk advice for firefighters
- Referrals
- Hoarding Notification System
- Inspections

### **2.5.1 Research and Evidence**

More formal research was required to understand hoarding and the extent of this issue in the MD. MFB developed and managed two subsequent studies. These were conducted in 2009 and 2012 by teams of students from WPI Worcester, Massachusetts, USA.

The first study, which examined incidents from 1999-2009, found 48 fires where hoarding was identified though they predicted that this is a vast underestimate of the actual number of hoarding related fires (Lucini et al., 2009). The results of their study showed that hoarding related fires were more severe than non-hoarding related fires based off of statistics such as the number of pumpers used, the number of responders working, how far the fire spread from the room of origin, and value of damage. The study also looked at aspects in the home such as if there was a working smoke alarm (only 26% of hoarding households), if egress was blocked due to hoarding (38% of reports noted this), and if the fire spread to adjacent structures (10%). Demographics of the victims were examined, and it was found that 73% of fires occurred in residences where the occupants were over 50 years of age and 77% of the occupants were male. The causes of hoarding related fires did not significantly differ from those in other homes with cooking accounting for 39% of the fires. However, 13% of the fires were started from “an unorthodox use of utilities” (Lucini et al, 2009). Two of the most significant findings from the 2009 hoarding study is that 24% of all preventable residential fire fatalities were related to hoarding and that hoarding “appears” to put persons at a high fire risk at a younger age than the “average person”.

In addition to these significant statistics regarding the hoarding related fire incidents from 1999-2009, the study found that hoarding was often left unmentioned in fire incident descriptions. In order to get more inclusive data for future studies, it was recommended that hoarding be included in incident reporting through AIRS or internal MFB reporting. Another recommendation in the study was to improve the rate of working smoke alarms in these households and develop a system through which responding firefighters would be made aware of

the increased risks for the occupants and crews when responding to home affected by hoarding. The study suggests that the current methods for dealing with hoarding are inadequate and that collaboration among agencies is critical to lessen the risks of hoarding.

As a continuation to the 2009 hoarding study, in 2012 MFB sponsored a second study which was also carried out by a team of WPI students. This study examined incidents from 3 April 2009 to 3 April 2012 and was intended for use by those working with either hoarding and squalor or fire and emergency services. This study identified 79 hoarding related incidents, including fire, emergency responses, and non-emergency responses. Emergency responses were incidents that MFB assisted Ambulance Victoria with and non-emergency incidents included responses such as lockouts and welfare checks. In this study, a database of incidents was created in order to assist the team in analysing the data for trends among those incidents specifically associated with hoarding. As with the previous study, the lack of a formal hoarding reporting system meant that the team had to use keyword searches and email correspondence in order to try to identify hoarding incidents. Again, because of this the 79 incidents was thought to be an underrepresentation of the actual number of incidents which are more likely to have occurred.

As with the first study, once incidents were identified, they were analysed for trends within the data. From the 2009 study, the reporting rate of hoarding incidents quadrupled. There was no gender bias found in this study. As with the first study, an age bias was found; 73% of people involved in incidents were 65 years of age or older. The data on causes of fires differed from the 2009 study; electrical causes accounted for the largest percentage of hoarding related fires (23%) and the percentage caused by cooking dropped to 18%. Another statistic that changed from the first study was the number of hoarding residences which had a working smoke alarm. In 2009, it was determined that only 26% of hoarding residences had a working smoke alarm, but in 2012 it was found that 63% of hoarding residences had a working smoke alarm and another 11% of homes had an undetermined smoke alarm status. Consistent with the first study, the second study showed an increase in the number of apparatus and manpower needed for a hoarding related fire as opposed to a fire not related to hoarding by up to three times the average. The percentage of hoarding related fires contained to the room of origin increased from 40% to 60%, however this is still lower than the average residential fire rate of 82%. A correlation to rooms with a working smoke alarm and fires which were contained within the room of origin

was also cited. The team also identified the fact that containment may be correlated to additional resources being dispatched initially if the residence was identified as a hoarding residence previously.

The first two hoarding studies conducted by WPI students and MFB show certain trends staying consistent over time and others changing. As a follow-up to both of these studies in order to further examine trends and continue to make improvements to the system we will be completing a third installment of the study which will include data up until 2014.

### **2.5.2 Engagement of Internal and External Stakeholders**

To raise awareness and understanding about hoarding and squalor, MFB Community Resilience actively engages with internal and external stakeholders. This engagement was first initiated after the three hoarding related fire fatalities in 2007 after which the first Victorian Hoarding Forum was convened by MFB at its Burnley Training College. Participation was targeted toward agencies with a shared responsibility and interest in an improving the outcome for affected people. The aim of the forum was to provide information from subject matter experts and share information about prevalence, practice, and common issues. Community Resilience also began collecting data on hoarding incidents and raised awareness of the issue firefighters to increase reporting. This information formed the basis of the first hoarding study which established hoarding as a high fire risk. It also provided evidence to develop risk reduction advice for affected people and the agencies and programs which support them. This included practical risk treatments such as the importance of installing smoke alarms, checking utilities, unblocking exits, establishing clearer pathways and a one metre clearance around cooking areas and heating sources. This information has been available on MFB internet since 2009 and is also included in the Hoarding Notification Information Pack. In addition to using actual causes of fire from the study, the risk reduction advice integrated emerging practice from subject matter specialists which endorses gradual reduction of the accumulated items rather than large scale removal.

After this process of consultation, research, and risk reduction treatments, MFB prepared a submission to Government seeking the establishment of a state based task force in 2009 to bring together external stakeholders to establish information and best practice. While this was not immediately successful, MFB continued to engage internal and external stakeholders. This



engagement was to raise awareness of the issue and relationship to risk through over 200 presentations at various events, forums, and conferences for:

- Local government (local laws, environmental health department, aged and disability department)
- Community aged and disability providers
- Animal welfare agencies
- Other state and territory fire services
- Aged and adult mental health services
- Aged care assessment services
- Community nursing
- Allied health
- Acute health
- Rehabilitation services
- Community and public housing providers

Internally, Community Resilience engaged with firefighters via training, promotional courses, and communication at a local station level to increase their awareness and understanding. This internal engagement also helps to promote the reporting of hoarding and squalor related incidents for follow up and data collection. In 2012, MFB was invited to participate in the Department of Health Statewide Hoarding and Squalor Task Force to work with stakeholders in the development of the Hoarding and Squalor Practice Recommendations for Service Providers manual.

### **2.5.3 Operational Response Considerations for Firefighters**

As part of its organizational commitment to increasing firefighter preparedness and safety and improved safety outcomes, information about the operational considerations about hoarding and squalor is included in the new edition of the MFB Emergency Response Guidebook (ERG). The ERG is a pocket sized booklet for firefighters that contains important information for firefighters in relation to a range of operational procedures, equipment and considerations. The information related to hoarding includes:

## **Considerations**

- Abnormally high fuel load for a residential property.
- Compromised access and egress.
- Increased risk of slips, trips, and falls.
- Increased likelihood of biohazards.
- Increased likelihood search and rescue required.
- Increased difficulty in identifying seat of fire.
- Increased risk of exposures (i.e. neighbours due to fuel load).
- Possible unsafe or illegal utility connection.
- BA and firefighting may destabilise stacked items, restrict access, and result in entrapment.
- Increased risk of infestation of vermin/pests.
- Obstructions may impede deployment of internal/external hose attack.

## **Safety**

- Rescue to be undertaken with consideration of crew safety.
- Safety Officer to monitor all firefighting operations.
- Comprehensive testing for gas and electricity risks.
- Ensure safe egress when undertaking internal attack.
- Watch for unstable obstacles and traps.

## **Actions**

- First responders must exercise caution if they are advised of or suspect hoarding/squalor.
- Early deployment of biohazard PPE (P2 mask, goggles, gloves).
- Protect exposures if external hoarding.
- Raise alarm level if engagement will be prolonged.
- Safety Officer to be attached to all hose lines.
- Identify hoarding/squalor in the description field in AIRS report.

The information also includes advice about reporting at a District level, and interdepartmentally and in AIRS. The inclusion of this information in the ERG recognizes the unique hazards and operational considerations for firefighters when responding to emergency incidents in affected homes. The development of specific procedures, warnings, or advice regarding hoarding and/or squalor for firefighters is to be expected as individual fire services agencies identify this as an issue within their jurisdictions. In the United States, at least one private training entity has developed training specifically for first responders.

#### **2.5.4 Referrals**

The process of referrals by MFB is an acknowledgement that fire risk is one of the more complex risks that affect people who hoard. To effectively address the risks including fire, it was necessary to develop a referral pathway which could address the range of safety, health, and wellbeing risks as part of an “all of government” response. Additionally, the first WPI/MFB hoarding study identified multiple incidents occurred at individual homes confirming that the risk is ongoing. Working collaboratively with multiple service agency providers maximizes resources to adequately and efficiently address fire and other risks related to hoarding and squalor.

While a referral can be generated internally or externally, they began as a response to firefighters' concerns regarding the ongoing risk identified in these homes through emergency response. Firefighters followed up these concerns through contact with MFB Community Resilience via phone or email to advise the cause, risks and of the likelihood of another emergency incident without some type of intervention or assistance.

In some instances, follow-up contact with reporting officer is required to gather more information which will support the process of identifying which external agency and/or program is best placed to engage the affected person. Details such as consent to refer, comorbidities, disability, and other risk issues are also identified. It is important to note that despite hoarding being identified as a separate mental health condition in DSM-5 (2013), no single program has yet been developed to refer affected people. As a result, MFB Community Resilience makes referrals to a wide range of agencies, including but not limited to:

- Aged Care Assessment Services
- Aged Psychiatric Assessment and Treatment Teams
- Acute health
- Local Government
- Local Laws and Environmental Health
- Community Housing providers
- Office of Housing

If the person is identified as already having a previous or existing relationship with a service provider, a referral is made to that respective agency for follow-up.

MFB also promotes the Hoarding Notification System when making referrals by including the Hoarding Notification Information Pack with risk reduction advice and attachments for further information to increase knowledge and promote shared practice. While knowledge and practice about hoarding and squalor is growing, a single referral can be protracted due to inconsistent practice and program funding limitations. Referrals may require follow-up and can include situations where a referring agency rejects the referral or where the agency may be unable to engage the affected person successfully. In situations where affected people refuse assistance, and without leverage such as local laws, environmental health, and tenancy laws, etc., there is no process through which to engage them. Additionally, many people do not fit with current program guidelines or eligibility criteria despite the level of the identified risk to them, their neighbours and responding firefighters.

#### **2.5.4.1 Internal/External Referrals**

An internal/external referral is one that is referred by a firefighter to MFB Community Resilience and is then referred out to an external agency. Internal/external referrals are most often the immediate consequence of a hoarding and/or squalor incident. Historically, firefighters made a referral via an email or telephone call to Community Resilience. To support this process, an automated form, called the Residential - Fire Safety Issue Notification is now available on the MFB Intranet for firefighters to use if they wish to do so. Below is an example of a typical internal/external referral process.

##### Example of Internal/External Referral Process

- MFB firefighters respond to a fire incident resulting from use of candles on top of computer, where hoarding is identified between seven and nine on the CIR scale. The home is occupied by a husband (mobility issues, aged 65+), a wife (aged 65+), and a daughter affected by long term mental health issues and the use of recreational drugs (aged approx. 30+). All occupants appeared to lack insight into their own risk. The elderly male also suffered smoke inhalation as a result of the fire.
- MFB Community Resilience identified that the property was managed by the Office of Housing.

- MFB contacted DHS regional office to speak to the housing worker to advise on the incident and MFB concerns regarding occupants and likelihood of another incident. MFB provided written confirmation of the details and risks as identified by the MFB officer.

#### **2.5.4.2 External/External Referrals**

External/external referrals begin with an external agency identifying hoarding and/or squalor and contacting MFB Community Resilience. The response to these types of referrals can vary and range from the provision of advice or MFB making a referral after an assessment of the circumstances and risk. Below is an example of an external/external referral process.

##### **Example of External/External Referral Process**

- A community aged service provider contacted MFB Community Resilience to discuss concerns identified during a home visit. Hoarding was identified at seven and nine on the CIR scale with an unusual quantity of chemicals in home, discarded Liquefied Petroleum Gas (LPG) cylinders, and the garden and grass was overgrown.
- MFB made phone call to Local Government Local Laws to discuss and request follow-up.
- Local Laws visited property, engaged the occupant, and was able to confirm the identified risks. Also that the occupant suggested there may be explosives in a safe in the home.
- MFB contacted Arson and Explosives at Victoria Police who conducted an inspection with MFB Fire Investigation. After performing a preliminary assessment inside and outside the premises, the situation was called via Triple Zero (000) as an emergency call including HAZMAT and the MFB Chemist. Over 2,000 litres of highly combustible and volatile chemicals were removed from the residence in an operation lasting from 9.30 am to after 6 pm.

#### **2.5.5 Hoarding Notification System**

The previous hoarding studies in 2009 and 2012 established that fire incidents involving hoarding increased risk for the occupant/s, neighbors and firefighters. With specialist advice and best practice recommending slow reduction of accumulated items as the approach most likely to

result in a long term outcome, it was apparent that even after linking an affected individual to support the risk remains high. In response, MFB Community Resilience developed the Hoarding Notification System (HNS).

In the event of a fire or other emergency, MFB firefighters are “turned out” in response to the event using the Station Turn Out (STO) system. This electronic system provides valuable information to responding firefighters including the address, map references, the location of hydrants, and other information. The HNS places a discreet electronic alert on this system with the notification of “hoarding high fuel load”. The HNS is designed to support firefighter preparedness and safety and warn of the increased need for search and rescue of the occupant/s, reduced access and other hazards such as slips, trips, falls, cave ins, potential biohazard, and issues related to utilities.

Individuals and agencies are provided with information about the system via the Hoarding Notification System Information Pack. In addition to the automated electronic referral, the pack includes information about how the system works, risk reduction advice, which suburbs it is available in and a section containing frequently asked questions. Currently referrals for the HNS are accepted from affected people, their families, general practitioners, other health specialists, and the agencies and programs that support them. MFB does not accept referrals from individuals or agencies that do not have an ongoing relationship with the affected person. MFB promotes the system when referring affected individuals identified through emergency response. Eligibility requirements include that all referrals must be for properties within the MD, have working smoke alarms and that hoarding is at level five or above on the CIR. The electronic referral form does not include the collection of information regarding the name, age, or any other personal details about the affected person or any other occupants of the home. The process for the HNS is as follows:

- The Hoarding Notification Information pack is sent out electronically with the Hoarding Notification Form and Discontinuation Form
- The form is completed by the referrer and returned to MFB Community Resilience
- The address is uploaded onto the HNS
- The HNS generates an automated confirmation to the referrer

- The HNS generates an automated email to the Operations Commanders in the District to advise operational crews who can perform a drive by only of the property for familiarization with the type of property, its proximity to other homes, if hoarding is visible outside increasing access issues, and the location of hydrants. In some instances this visual assessment may result in the allocation of an additional firefighting appliance as part of first response in the event of a fire emergency
- After a period of 18 months, the HNS generates an automated renewal to the referrer requesting confirmation to continue or remove the alert
- A property address can be removed at any time by using the Discontinuation Form

The HNS is managed by MFB Community Resilience and is accessible to key workers within the department to ensure confidentiality and the information contained on the system is not shared with other agencies. In relation to consent MFB promotes engaging the affected person for permission to refer on the basis that it will maximize the potential of their own safety outcome in the event of a fire and to promote a higher awareness of their risk. In the event of issues related to consent, MFB recommends agencies consult their organizational policies in relation to privacy and risk.

### **2.5.6 Inspections**

In some circumstances, MFB Community Resilience will perform an inspection of a hoarding property. MFB does not conduct inspections of properties with squalor alone because it is unlikely to assist in reducing a complex range of risks which require specialist assessment and intervention. For an inspection to occur, the request is must meet the criteria as defined in the Community Resilience Recommended Practice (MFB, 2014a) guidelines as follows:

- That the residence is in the Metropolitan District
- That the hoarding level is at the extreme end of the CIR
- That all options to engage the person regarding risk have been exhausted or that request is via a formal legal process
- That the affected person has consented to the inspection

Once all of the inspection criteria has been met, any additional risk information from the referring agency is gathered. The inspection is then carried out by a representative from MFB Community Resilience Emergency Department, the Community Resilience Commander from the relevant MFB District, and a representative from the agency requesting the referral.

Requests for inspections come from a wide range of agencies within the MD such as community care providers and housing agencies. Inspections are also received as a part of formal processes resulting from action at the Victorian Civil Administrative Tribunal (Residential Tenancies List, Guardianship List and Civil List) and Magistrates Court.

The aim of an inspection is to quantify the level of risk, determine the causes, and provide prioritized risk reduction advice. This requires background information such as what steps have been taken to engage the affected person and if the inspection is as a result of a formal process such as action via VCAT or the Magistrates Court. During an inspection the occupant/s are actively engaged in assessing the level of hoarding in and around the home as well as identification of the risks specific to an individual residence. After an inspection of the property is completed a formal written report is prepared which also includes prioritized risk reduction recommendations. A copy of the inspection report is provided to the affected person and the agency requesting the inspection.

## **2.6 Background Summary**

Hoarding and/or squalor presents a wide range of risks and challenges not only for the occupants of a residence but also for responding firefighters and emergency personnel. Both are often misunderstood and despite growing research and developing treatment, response, and practice is inconsistent. MFB has worked to increase knowledge and understanding regarding both issues through a range of organisational responses including research and strategies to support affected people, their families, and the agencies that support them. This includes risk reduction advice and increasing firefighter preparedness and safety to deliver an improved individual and community safety outcome.



## **Chapter 3: Methodology**

The aim of this project is to assist MFB in continuing to proactively address the risks posed by hoarding and squalor. It will do this by illustrating the increasing presence of hoarding and/or squalor incidents within the Metropolitan District (MD). Our primary objectives for this project are to:

1. Identify hoarding and squalor related incidents and referrals from 4 April 2012 to 3 April 2014 (Study Period).
2. Analyse available data of identified incidents during the Study Period and compare findings to the 2009 and 2012 hoarding studies when applicable.

The start date of the Study Period is concurrent with the end date of the 2012 hoarding study. An Excel file of Australian Incident Reporting System (AIRS) reports was created which contained all incidents that MFB responded to within the Study Period. AIRS is an emergency management reporting system used by all Australian fire services. It contains data on all fire services responses. Data is generated via a report written by the senior officer attending the incident. This data was used to identify hoarding and squalor related incidents. Only incidents responded to by MFB and within the boundaries of the MD were included in this study. The location was restricted due to availability of data and to assist in limiting the scope of the study. This study includes all calls responded to by MFB including, but not limited to, fires, emergency medical responses, motor vehicle accidents, lockouts, and welfare checks. The remainder of the chapter describes the methods we adopted to accomplish our stated objectives.

### **3.1 Identify Hoarding and/or Squalor Incidents and Referrals Occurring During the Study Period**

We utilized two main methods for identifying hoarding and/or squalor incidents during the Study Period. The first was hardcopy referrals and the second was an extensive keyword search through AIRS. In addition, we completed an address search in AIRS of confirmed hoarding and/or squalor residences to find repeat incidents at the same address. These three methods are described in detail within their own sections below.

### 3.1.1 MFB Hoarding and/or Squalor Referrals

Our first step was to find all hoarding and/or squalor related notifications and referrals from the Study Period. Referrals include exchanges between Community Resilience and firefighters or external agencies. Many of these include details about the hoarding and/or squalid household and other information involving physical and/or other disabilities that may increase fire risk.

To determine if a referral indicated that hoarding and/or squalor conditions were present, different methods of examining the documentation were necessary. The following criteria were used to identify referrals that contained hoarding and/or squalor conditions.

- A referral mentions “hoarding” or “squalor”. This direct mention was verified by reading the full document to confirm an accurate reporting of hoarding and/or squalor.
- A referral indirectly mentions hoarding and/or squalor. These referrals were by identified by reading through each referral looking for descriptions and keywords indicative of hoarding and/or squalor that were not actually the terms “hoarding” or “squalor”.

For example, in a 2013 referral, a Residential Fire Safety Issue Notification was submitted by a MFB firefighter who stated that a police officer was “concerned for potential fire load due to newspapers stacked throughout the house approx. ½ metre high and backyard is apparently full of rubbish.” This referral is an example of one way that hoarding can be described without being clearly labelled as “hoarding”. While reading referrals, the team identified and compiled a comprehensive list of keywords that includes terms commonly found to describe hoarding and/or squalor conditions. The list of keywords dynamically changed throughout the identifying process as we read referrals. MFB personnel reviewed, supplemented, and approved this list of keywords; this list was used both while reading referrals and also for use in a keyword search through AIRS data, described in Section 3.1.2 below. Below in Figure 5 is a table of example keywords besides “hoarding” and/or “squalor”.

Example Keywords	
Fuel Load	Decay
Rubbish	Clutter
Blocked	Pile

**Figure 5: Example Keywords**

A comprehensive list of keywords is provided in Appendix B along with an explanation as to why each word was added the list, if the word was not included in previous studies, and/or why the word was eliminated or altered. In addition, there is information on how many total incidents those keywords produced and the number of them that were confirmed incidents of hoarding and/or squalor.

In some cases, it was necessary to speak with MFB personnel who were familiar with the referral to determine if hoarding or squalor were present. Some terms/phrases such as “rubbish”, “increased stocking”, and “very smelly due to dogs, some old food and a lack of general cleaning” were occasionally used to describe living conditions. In these cases, it was necessary to verify the existence of hoarding or squalor if it was not evident in the description in the report.

Once we identified referrals related to hoarding and squalor, it was necessary to verify if there was an incident associated with that referral. This study was limited to hoarding and/or squalor related incidents that MFB responded to. This meant reading the referral for any reference to an incident number or description of an incident. Referrals which did not correspond to an incident commonly came from firefighters and external care providers who were aware of a hoarding and/or squalor residence.

Once referrals were confirmed to be hoarding and/or squalor as well as being associated with an incident, the team created a spreadsheet to store these confirmed incidents and related information for later data analysis. We recorded demographic information (if available from the referral or associated AIRS report description box) such as gender, age, and property type. In addition, the associated AIRS data was transferred into this database.

### **3.1.2 Identify Hoarding and/or Squalor Incidents in AIRS**

After reading and identifying all hoarding and/or squalor related referrals, we searched through all MFB AIRS reports within the Study Period. All AIRS reports were transferred into a

spreadsheet and provided to us. This spreadsheet contained approximately 40,000 incidents including structure fires, non-structure fires, emergency medical responses, false alarms, and other incidents such as lock-ins and welfare checks.

We used this spreadsheet to search for all the hoarding and squalor keywords listed in Appendix B. The process used to search for keywords and filter out incidents with the keywords included in them involved several refinements. The most refined method is outlined below.

1. Use the "Find All" function to search for every instance of the keyword within the description box in AIRS.
2. Read each report containing this keyword and determine if they are hoarding, squalor, or hoarding and squalor.
  - a. To be determined as a hoarding and/or squalor case, incidents' descriptions needed to describe hoarding and/or squalor conditions based on the technical definitions. For example, a description stating that rubbish was stacked to over a metre high would be classified as hoarding, because it is over a five on the CIR.
  - b. If an incident was questionable, it was flagged for review by MFB personnel.
3. Review cases with MFB personnel to ensure each case is properly identified as hoarding and/or squalor, to clarify questionable cases, and eliminate any that are not hoarding/squalor.
4. Email firefighters who wrote the report for clarification and further information if MFB personnel in office are unfamiliar with the case and unsure of presence of hoarding and/or squalor.
5. Add the AIRS data of each confirmed incident to the database along with the keyword/s included in the incident description. Record demographic information (if available from the AIRS report description box) such as gender, age, and property type. Continue to amend this database with more information with regards to each case during the data analysis process.

During this process, we used the keyword list we created during the referral incident identifying process. However, it is important to note the dynamic nature of the keyword list

continued during the AIRS word search process. Sometimes, when reading a referral it was easy to identify a word such as rubbish being used to describe hoarding quite frequently. However, when searching AIRS for the word “rubbish,” there were over 1,800 reports which contained the word. When we started to read each description, it became apparent that there were certain uses of the word “rubbish” that could be excluded as they were not indicative of hoarding situations – for example, “small rubbish fire”. Therefore, the word list continued to be refined throughout the word search process. Refinements of keywords to exclude other words are described within the word search appendix, Appendix B.

### **3.1.3 AIRS Address Search**

Once a database of confirmed hoarding and/or squalor incidents was created from the first two incident identifying methods, the team then searched AIRS using each address in order to identify recurring incidents within the Study Period. Because hoarding and/or squalor are chronic and have ongoing risks, it was hypothesised that any additional incident occurring at an identified residence would also be a hoarding and/or squalor related incident. By searching for known addresses, the team was able to identify additional hoarding and/or squalor incidents that were not found with the previous two identifying methods.

### **3.2 Analyse Available Data of Identified Incidents During the Study Period and Compare Findings to the 2009 and 2012 WPI/MFB Hoarding Studies When Applicable**

To obtain an accurate profile of hoarding and/or squalor incidents and to quantify the severity and prevalence of these issues, specific variables from the identified incidents were analysed. Consideration of variables such as cause of fire, point of origin, location, and property type are critical in comprehending hoarding and/or squalor incidents and affected people. This analysis allowed the team to confirm and expand upon the results of the 2009 and 2012 hoarding studies.

The team initially derived a list of variables from the results of the 2009 and 2012 hoarding studies. To expand and refine our results from that of the previous studies, we determined variables that could be added, removed, or altered from the previous hoarding studies.

In order to organise the information in a way in which formulas could be used to produce tables and charts, it was necessary to create our own system instead of relying only on the AIRS variables. In many cases, AIRS fields included a multitude of variables which, for the purpose of our study, could be combined to create more easily understandable variables. For example, the field for “area of fire origin” of the fire had many variables to describe parts of the outside of the home, such as front yard, backyard, and porch, but for the purpose of our study, these were combined into a single variable called “exterior”. It was also necessary to create our own data labels due to the fact that certain variables were interpreted from more than one AIRS field; for example, we used both "ignition factor" and "form of heat ignition" in order to interpolate the cause. Therefore, in most cases, it was necessary to create additional columns of data that used both referral information (where applicable) and AIRS information to populate these columns.

There were limitations to our study due to incomplete and unclear information in the AIRS data. Some data of interest such as age, gender, and occupancy are not collected in AIRS and the team needed to manually add this supplementary information where it was available from referrals. Not every incident had all the information we were searching for, so some areas of analysis have a smaller sample size. Where this occurs, it is noted within the results section.

For the analysis of each variable and its associated visual representations, we made observations and conclusions that noted any unique characteristics. For example, in the age category, we found that over 80 per cent of hoarding and/or squalor victims were 50 years old or older. Conclusions, like this one, indicate specific features about hoarding and/or squalor and help provide information needed to create an accurate profile and to provide recommendations for MFB and other fire services.

## Chapter 4: Results and Analysis

The team identified 102 hoarding and/or squalor related incidents, of which 54 were fires, during the Study Period. We examined key variables of all hoarding and/or squalor related incidents as well as information specific to fires. These results were compared to the two previous WPI-MFB hoarding studies, where applicable to note any significant changes in results related to hoarding and/or squalor related incidents.

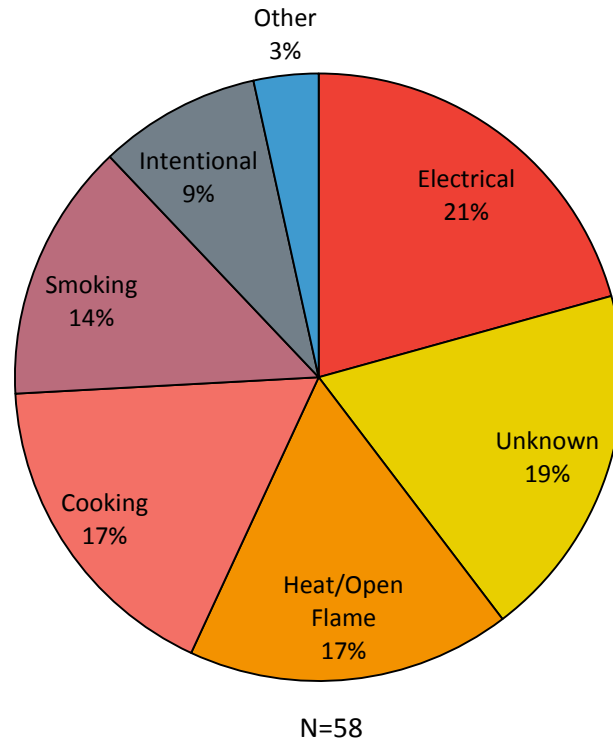
### 4.1 Characteristics of Hoarding and/or Squalor Related Fires

Fire incident data contains variables such as cause, room of origin, and number of attending appliances that can assist in drawing conclusions about the nature of hoarding and squalor, related fires. 58 fires in hoarding and/or squalor properties were identified in the study period. The section below discusses these variables in detail and presents notable findings that help define the severity, prevalence, and increased risk of hoarding and squalor related fires.

#### 4.1.1 Cause of Fire

**FINDING: Electrical, cooking, and heating/open flame are the three most common causes of hoarding and/or squalor related fires.**

Understanding cause of fire helps improve risk reduction advice related to hoarding and/or squalor residences by providing insight into what type of activity the occupant may have been doing at the time of the fire. Figure 6 shows the distribution of causes of hoarding and/or squalor related fires. For a large portion of the identified fires, a specific cause was unable to be determined. Some of these fires were considered suspicious and the source of the fire was unable to be identified.



**Figure 6: Causes of Fire for Hoarding and/or Squalor Fires**

Out of the 58 hoarding and/or squalor fires identified, the three most common causes of fires were electrical, heat/open flame, and cooking which are all associated with activities of daily living. This finding is consistent with the previous two hoarding studies and suggests that people affected by hoarding and squalor have a significant fire risk while performing normal daily tasks. For example, hoarded items around a stove present a greater fire risk due to the proximity of combustibles to the heat source and the possibility of items falling into an open flame. Because these tasks are done multiple times a day, this fire risk is constant and ongoing.

Looking more closely at cause of fire in relation to structure and non-structure fires, fires within a structure were accidental a majority of the time while non-structure fires were more often deliberately started. Intentional fires only accounted for 2.3% of structure fires while accounting for 28.6% of all non-structure fires. An additional 35.7% of non-structure fires had an undetermined cause of fire. Despite having a small sample size of 14 non-structure fires, there is clearly a difference in causes of fires between structure and non-structure fires. As a result, it seems that the fire risk inside is more inherent to the environment whereas the fire risk associated outside the structure is more inherent to behaviour.

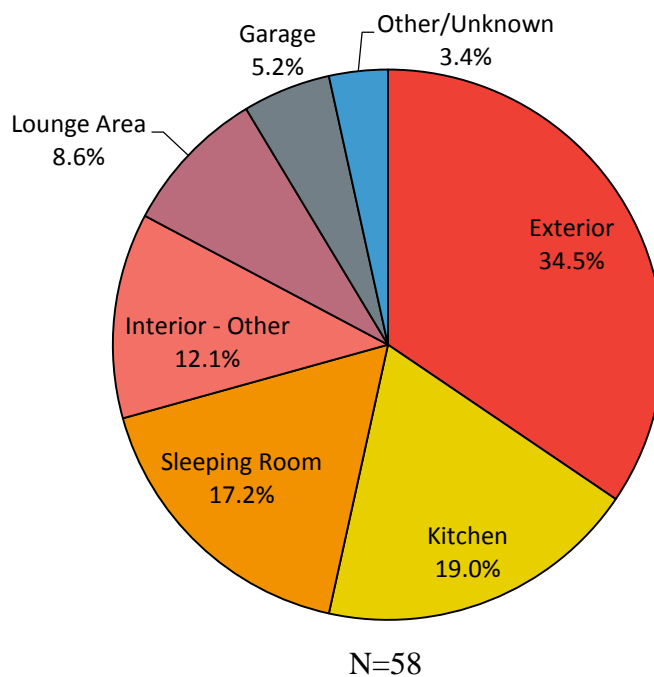


#### 4.1.2 Point of Origin

**FINDING: Kitchen and sleeping room are the most common rooms of origin in hoarding and/or squalor structure fires.**

**FINDING: Point of origin being on the exterior of structures increased in comparison to the previous hoarding studies.**

When the cause of the fire is related to a point of origin, it may help reveal the activity of the occupant that led to the fire. Although, in hoarding and squalor households, rooms are often used for a different purpose than for which they were intended (Barksdale et al, 2006). A breakdown for point of origin for all hoarding and/or squalor related fires is shown in Figure 7.

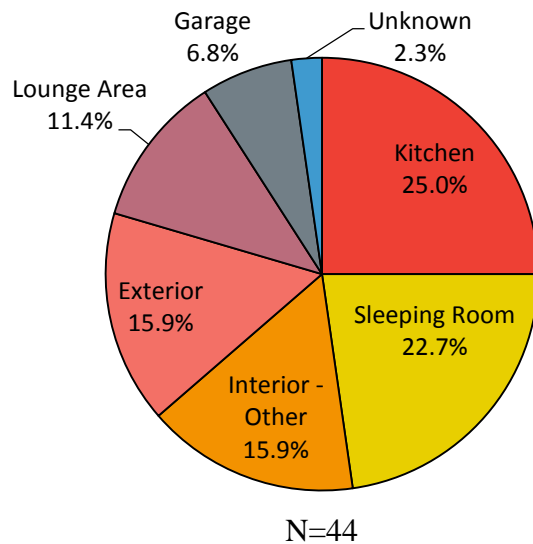


**Figure 7: Point of Origin for All Hoarding and/or Squalor Related Fires**

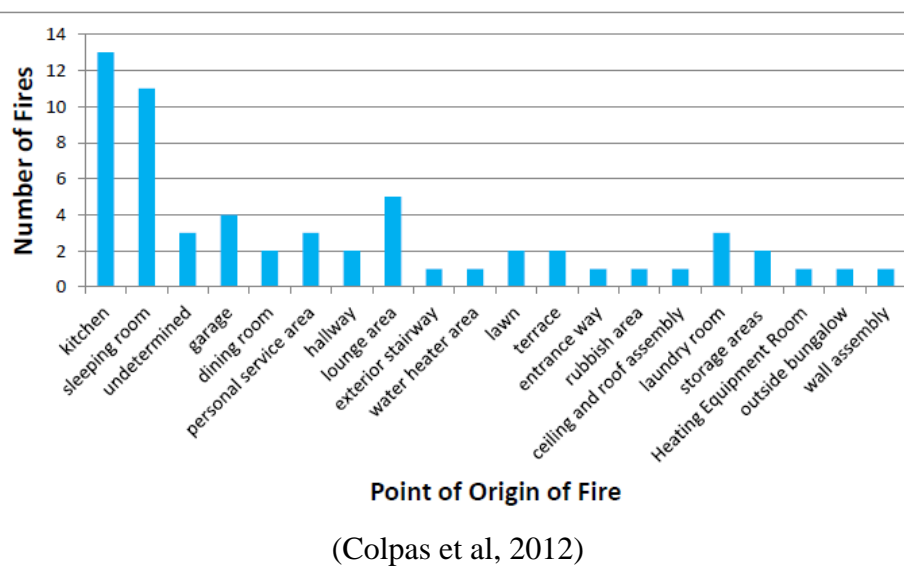
We examined point of origin in hoarding and squalor fires to determine the most common areas where fires occur. For the purpose of this study, areas including lawn, yard, decks, terrace, and other terms describing the exterior of the structure were combined to make a single exterior category. The bathroom, entrance way, dining area, laundry room, and cloak room were categorised into the “Interior – Other” category because there were relatively few fires originating in these areas. Figure 7 shows the three most common points of origin of all hoarding and/or squalor fires were the exterior of the structure, kitchen, and sleeping area. These areas account for 70.7% of hoarding and/or squalor related fires. The most common point of origin

was the exterior of the structure, accounting for 34.5% of fires, a relatively large increase from the 2012 hoarding study. Although this difference could be due to small sample sizes, this finding could suggest that there is increasing identification of hoarding outside the household.

Figure 8 shows, when isolated to just structure fires, the points of origin for almost half the incidents were kitchen and sleeping room. Similar to the findings of the 2012 hoarding study, seen in Figure 9, this data confirms that fires most often occur where occupants perform activities of daily living such as eating and sleeping.



**Figure 8: Point of Origin for Hoarding and/or Squalor Related Structure Fires**



**Figure 9: Point of Origin of Hoarding Fires from 2012 Hoarding Study**

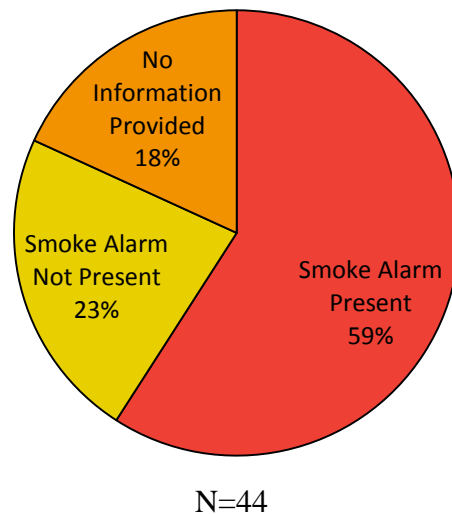
### 4.1.3 Presence and Operational Status of Smoke Alarms

**FINDING: A quarter of hoarding and/or squalor related fire incidents did not contain a smoke alarm.**

**FINDING: The majority of residences where hoarding and/or squalor related fire incidents occurred did not contain a working smoke alarm.**

Smoke alarms provide an effective early fire warning for occupants of a residence. The past two studies found that, in comparison to all residences, hoarding and squalor households contained working smoke alarms less often. People affected by hoarding and/or squalor are often older and may potentially have less mobility and a reduced reaction time. Compliance with smoke alarm legislation by affected people and the agencies that support them can increase early warning of a fire and provide time to escape safely and call Triple Zero (000).

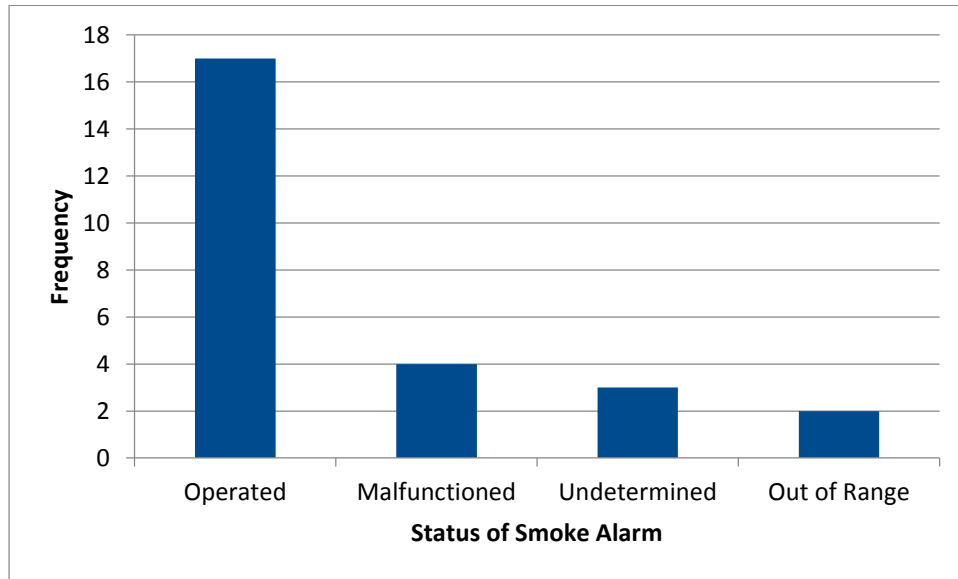
Figure 10 shows that 59% of hoarding and/or squalor residences that had a structure fire had a smoke alarm present. Although this is a large increase from the 26% of hoarding households that had a smoke alarm present in the 2009 hoarding study, there is still room for improvement.



**Figure 10: Presence of Smoke Alarms in Hoarding and/or Squalor Related Structure Fire**

Figure 11 shows the status of smoke alarms that were present during a hoarding and/or squalor related structure fire. Of the 26 fires where a smoke alarm was present, 17 devices

operated and four of them malfunctioned. Combining these two figures leads to a finding that only 38% of smoke alarms operated during a hoarding and/or squalor related structure fire.



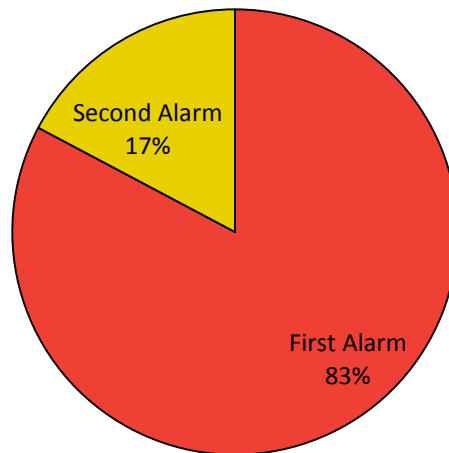
N=26

**Figure 11: Operation of Smoke Alarms in Hoarding and/or Squalor Related Fires**

#### **4.1.4 Alarm Level**

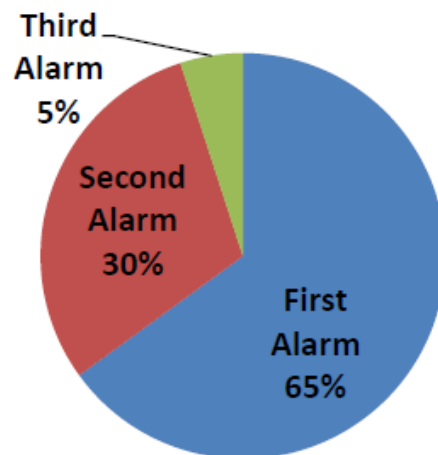
**FINDING: Majority of hoarding and/or squalor related fires were first alarm.**

Alarm level, which categorises fires by the required fire service response, is one way to examine the severity of a fire. In terms of MFB’s operational response to fire, first alarm fires require two pumpers with an option for a third. Second alarm fires require four pumpers with the option of one teleboom, one rescue unit, and one commander. Third alarm fires require eight pumpers, one teleboom, one rescue unit, one ladder platform, one breathing apparatus unit, one control unit, three commanders, and one duty officer. Figure 12 shows the distribution of alarm level for hoarding and/or squalor related fires during the Study Period.



**Figure 12: Alarm Level for Hoarding and/or Squalor Related Fires**

Similar to the findings found in the 2012 hoarding study, seen below in Figure 13, the majority of fires related to hoarding and/or squalor were first alarm fires. It is important to note that the alarm level reported in AIRS may not always reflect the actual number of resources on scene. The incident controller has the ability to request additional resources without necessarily requesting the full suite of resources that an escalation in alarm level will provide.



(Colpas et al, 2012)

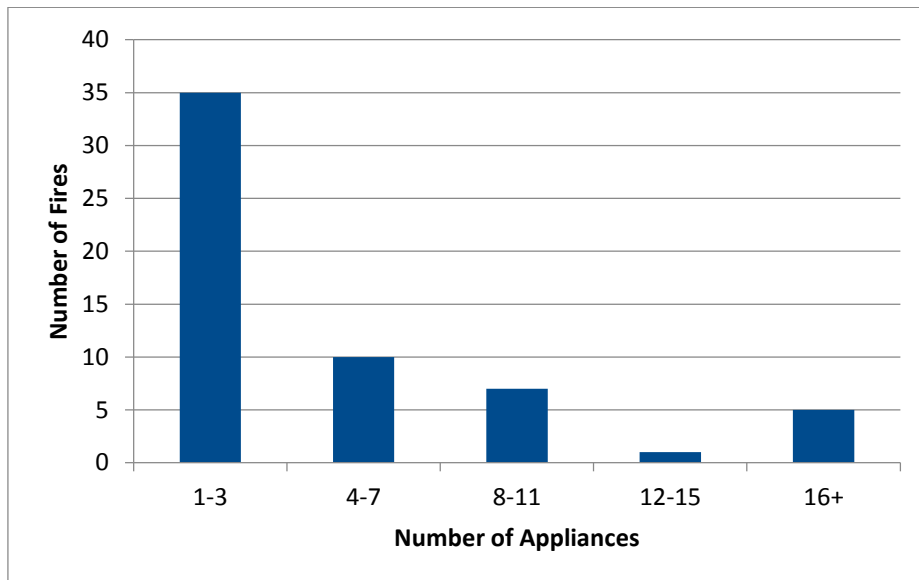
**Figure 13: Alarm Level for Hoarding and/or Squalor Fires from 2012 Hoarding Study**

#### 4.1.5 Total Number of Appliances and Total Number of Pumpers

**FINDING: 38% of hoarding and/or squalor fires required more than 3 appliances.**

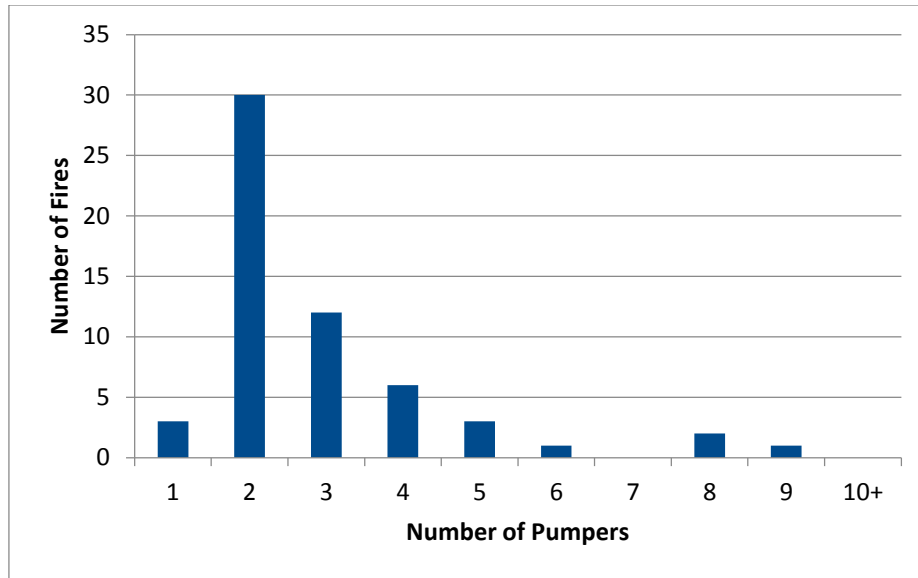
As with alarm level, the total number of appliances and pumpers attending provides a gauge of the severity of a fire. The total number of appliances is a measure of the resources that were required to extinguish the fire and stabilize the scene. The more appliances, the more resources were needed to control the fire, and the greater the severity of the fire. The pumper is the main appliance to attend a fire and is the most directly relatable to the severity of the fire. Both the total number of appliances and the total number of pumper trucks are shown below in N=58

Figure 14 and Figure 15.



N=58

**Figure 14: Number of Appliances for Hoarding and/or Squalor Related Fires**



N=58

**Figure 15: Number of Pumpers for Hoarding and/or Squalor Related Fires**

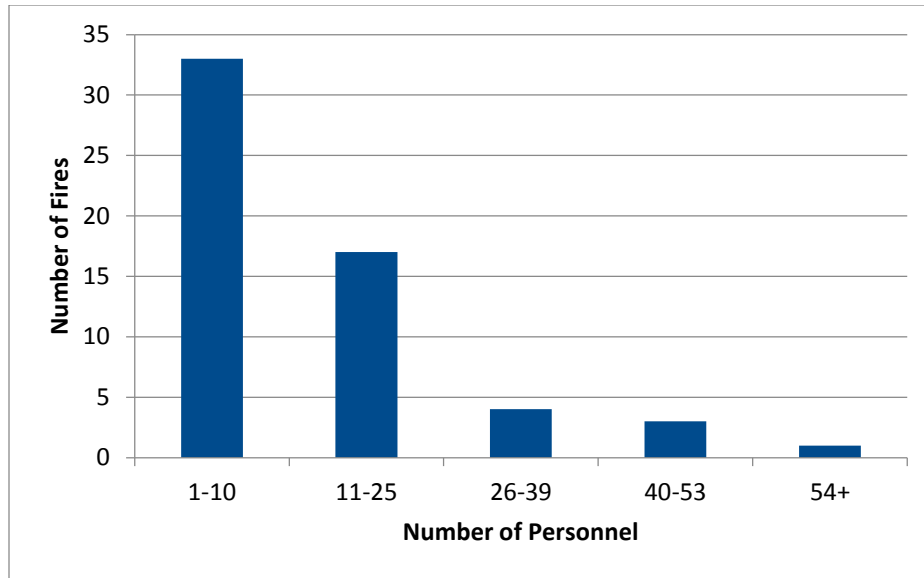
Within the MD, two pumpers are automatically dispatched to all residential structure fires. The few cases that had only one appliance are incidents where two appliances were dispatched and one was called off before reaching the scene.

Confirming the findings from the 2012 hoarding study, most fires required one to three appliances with the majority of incidents requiring two pumpers. However, a significant portion (38%) of these fires still required more than the standard first alarm response, suggesting that hoarding and/or squalor related fires often need more resources to fight.

#### **4.1.6 Total Number of Personnel**

**FINDING: Almost half of all hoarding and/or squalor fires require more than 10 personnel.**

Number of personnel is linked to the total number of pumpers, as each is typically manned by three or four firefighters. However, with each increase in alarm level, more personnel beyond those operating the pumpers are required, including specialized units and commanders. Number of personnel is another method of estimating the severity of the fire. Figure 16 below shows the distribution of personnel attending a hoarding and/or squalor related fire.



N=58

**Figure 16: Number of Personnel Attending Hoarding and/or Squalor Related Fires**

As evidenced, most hoarding and/or squalor related fires require between one and ten personnel. However, a significant percentage of the cases (43%) required more than ten and even as many as 54 personnel.

#### 4.1.7 Containment of Fire

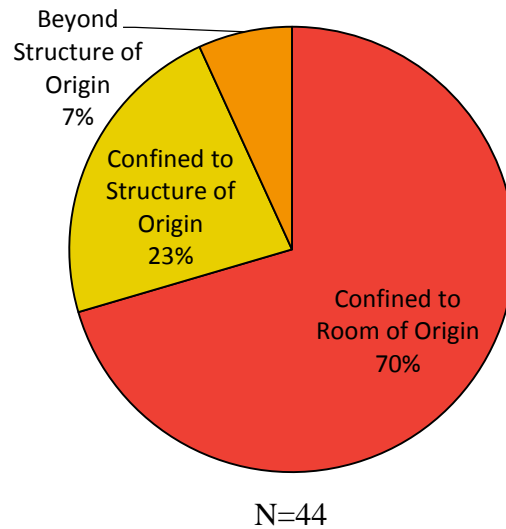
**FINDING: Hoarding and/or squalor related fires are less often contained to the room of origin than average residential fires.**

Most fire services in Australia measure their success of fighting structure fires based on the proportion of fires that they are able to contain to the room or object of origin. Containing a fire to the room of origin reduces potential damage and prevents the fire from spreading. A fire contained to its room of origin is less likely to be severe and to impact on neighbouring structures. Within the MD, MFB is able to contain 90% structure fires to the room of origin.

We found that 70% of hoarding and/or squalor related structure fires were contained to the room or object of origin (Figure 17), 20% less than average residential fires. The difficulty in containing a hoarding and/or squalor fire to the room of origin is likely due to the high fuel load and other exacerbated fire risks. Despite an increase from the previous two hoarding studies from 40% and 60% containment to room of origin, it is unclear whether the differences in containment figures are statistically significant or if the improvement in the current study is due to operational



factors. Nevertheless, all three studies have found that on average hoarding and squalor fires are more difficult to contain than other residential fires.

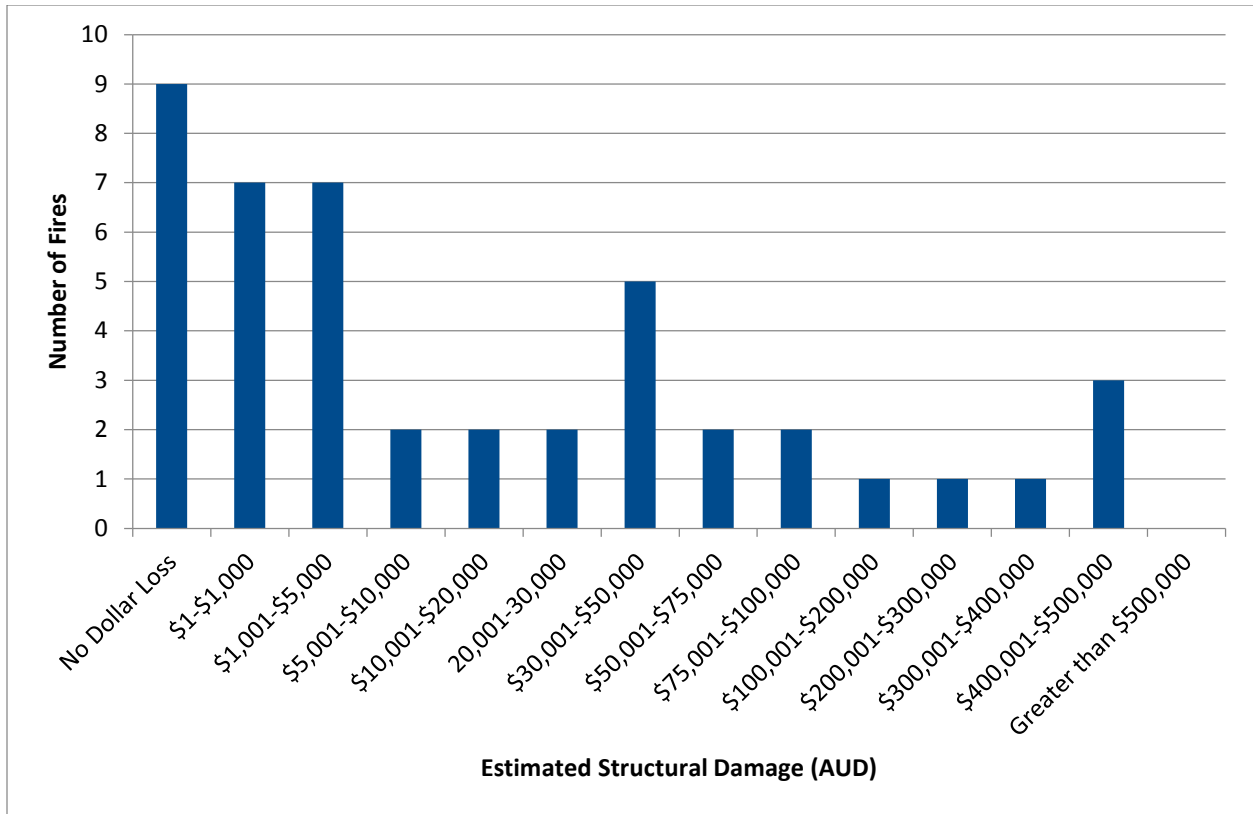


**Figure 17: Containment of Hoarding and/or Squalor Related Structure Fires**

#### **4.1.8 Estimated Structural Dollar Loss**

**FINDING: A majority of hoarding and/or squalor related fires had an estimated structural dollar loss of less than \$100,000.**

Estimated structural dollar loss is a way to quantify the structural damage to a property and is another method to determine the severity of a fire. The value reported in AIRS for structural dollar loss is an estimation made by the incident controller at the scene. Figure 18 shows the estimated structural dollar loss for hoarding and/or squalor related structure fires and does not include estimated dollar loss for damage of contents.



N=44

**Figure 18: Estimated Dollar Loss for Hoarding and/or Squalor Related Fires**

Of the 44 identified hoarding and/or squalor related structure fires, 86%, or 38 fires, had a dollar loss of \$100,000 or less. The average structural damage was \$68,000 with a maximum estimated damage of \$500,000. Estimated structural dollar loss has not changed significantly from the first two hoarding studies and that the majority of hoarding related fires have less than \$100,000 of structural damage.

#### **4.2 Characteristics of All Hoarding and/or Squalor Related Incidents**

In this section, all hoarding and/or squalor related incidents are analysed including fires and other incidents. Of the 102 identified incidents, 44 were not fire incidents. There are additional variables relevant to hoarding and/or squalor related incidents that are not specific to fires, and a separate analysis was performed to include all incidents. Variables such as age, gender, property type and tenure, and household occupancy are explored to obtain demographic

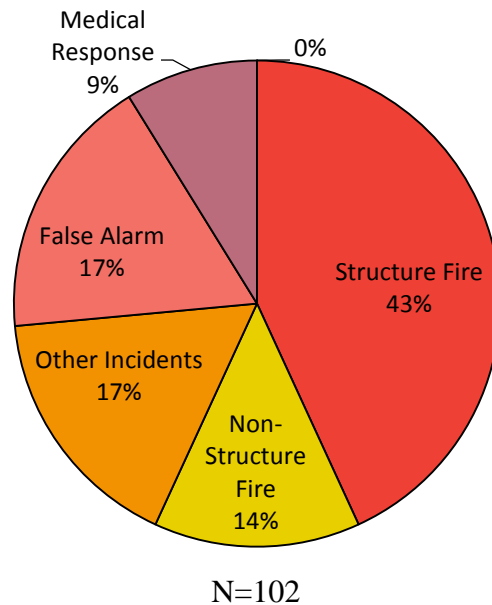
information about the occupants and households of hoarding and/or squalor incidents, including fire. This is vital in developing a profile of individuals affected by hoarding and/or squalor.

#### 4.2.1 Incident Type

**FINDING: Fires make up a majority of hoarding and/or squalor incidents.**

**FINDING: MFB is responding to an increasing amount of non-fire hoarding and/or squalor related incidents.**

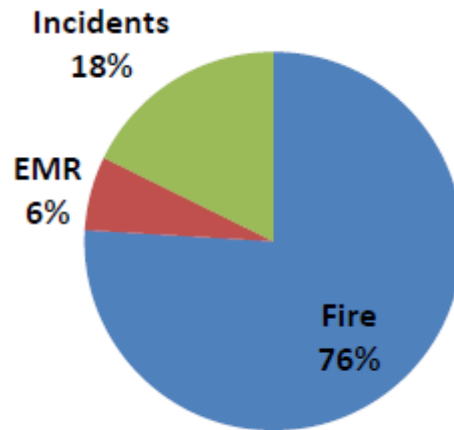
MFB's turn out to hoarding and squalor households is not limited to fire incidents. During the Study Period, MFB responded to 44 structure fires, 14 non-structure fires, 17 false alarms, nine emergency medical responses, and 17 other incidents involving hoarding and/or squalor, as shown in Figure 19. Examples of incidents in the "other incidents" category include lock-ins and lock-outs, hazardous material response, and assistance with Victoria Police and Ambulance Victoria.



**Figure 19: Distribution of Incident Type of Hoarding and/or Squalor Related Incidents**

43% of identified incidents were classified as non-fire responses which is a significant increase from the 24% identified in the 2012 hoarding study (Figure 20). There are a number of factors which may explain why the current study found a broader range and increased number of incidents. These include statistical variation due to the small samples size in each hoarding study,

a more refined methodology and expanded scope from the previous two hoarding studies, and better identification of hoarding and squalor by MFB operational personnel.



(Colpas et al, 2012)

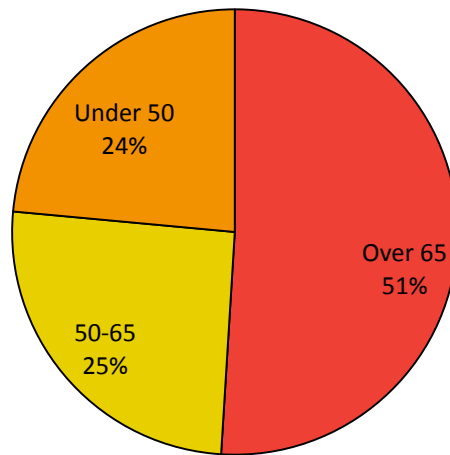
Figure 20: Distribution of Hoarding Incidents in 2012 Hoarding Study

#### 4.2.2 Age

**FINDING: The majority of hoarding and/or squalor incidents involve adults over the age of 65.**

Older people are one of the highest fire injury and fatality risk groups living in the community. When hoarding and/or squalor are present, this risk is compounded further. The previous two hoarding studies identified an ageing population in Melbourne and predicted that hoarding and/or squalor incidents are likely to increase in occurrence. It is not required for firefighters to record demographic information such as age into AIRS. However, of all 102 hoarding and/or squalor incidents, the ages of 51 people were identified. Figure 21 shows the distribution of age across this subset of hoarding and/or squalor related incidents. The team observed that for all these incidents, and for those that were fire incident, a majority of people were over 65 years old. This suggests that hoarding and squalor exacerbate the already present fire and safety risks of ageing.

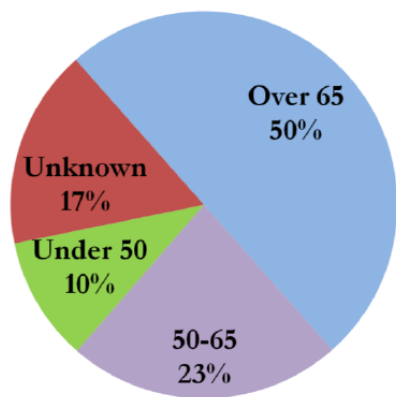
The 2009 and 2012 age distributions for hoarding related fires are seen in Figure 21.



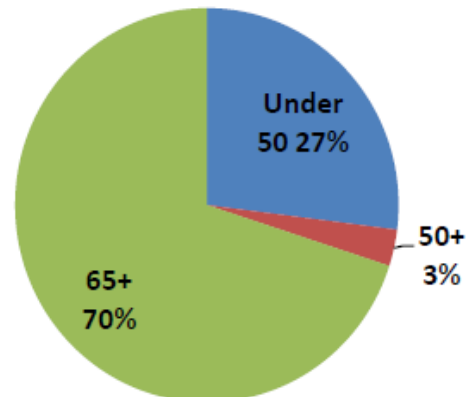
N=51

**Figure 21: Age Distribution of All Hoarding and/or Squalor Related Incidents**

Although the proportion of affected people over 65 has varied in all three studies, it is consistent that those aged over 65 are the group most susceptible to incidents related to hoarding and squalor. Figure 22 shows the age distribution from the previous hoarding studies. The differences in age distribution between the three studies can be most likely attributed to the small sample sizes of the studies.



(Lucini et al, 2009)



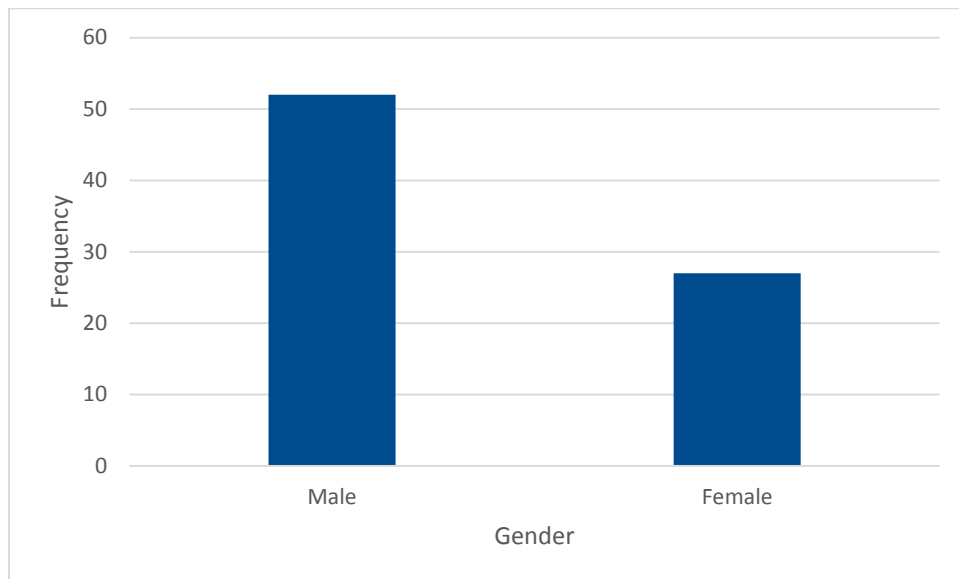
(Colpas et al, 2012)

**Figure 22: Age Distribution of Hoarding Related Fires from 2009 (left) and 2012 (right) Hoarding Studies**

### 4.2.3 Gender

**FINDING: Hoarding and/or squalor related incidents occur more frequently in residences associated with males.**

In recent research, there has not been a proven relationship between hoarding and/or squalor and gender. In our study, there were 79 instances where gender was defined. Figure 23 below shows that in our study men were more likely to be involved with a hoarding and/or squalor related incident. Similar findings were observed when we looked exclusively at the subset of hoarding and/or squalor related fire incidents.



N=79

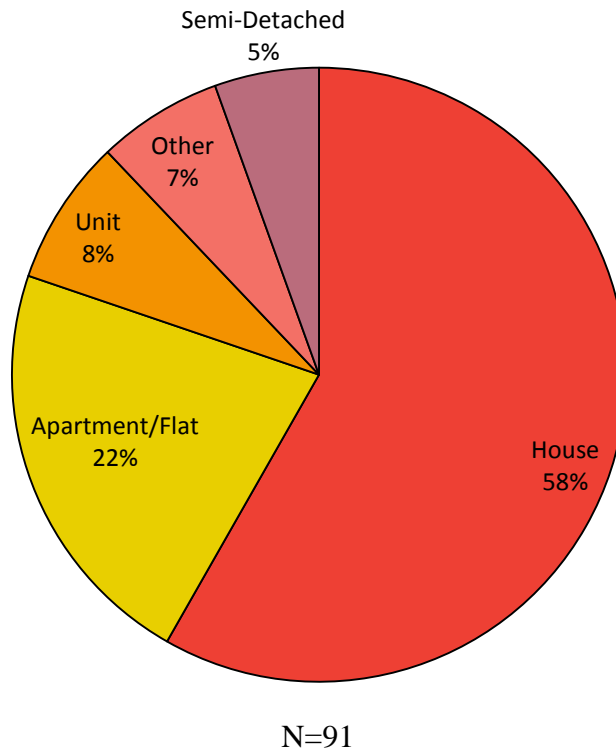
**Figure 23: Gender Distribution of All Hoarding and/or Squalor Related Incidents**

The 2012 study found an even distribution of male and female occupants in hoarding related incidents, whereas the 2009 study showed males were 68% of identified occupants in hoarding related incidents. All three studies having small sample sizes may account for the inconsistencies.

#### 4.2.4 Property Type

**FINDING: Hoarding and/or squalor related incidents occur most frequently in stand-alone houses.**

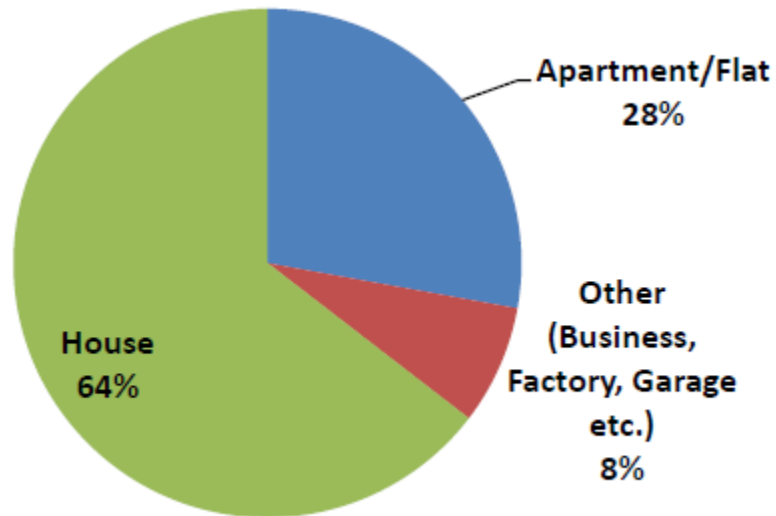
Property type is an important variable because it shows the types of households in which hoarding and/or squalor related incidents are most likely to occur. There are many different property types within the MD; the most common types are houses, semi-detached houses, apartments/flats, and units. Each type of dwelling presents a different set of risks for firefighters, inhabitants, and neighbours. For example, due to their proximity to one another, semi-detached houses, apartments/flats, and units may present a much higher risk of a fire spreading to neighbouring residences. Specific property types are not recorded in AIRS, and it was not possible to distinguish it for every incident. The team collected the known property types from additional data provided by referrals and AIRS descriptions. Figure 24 below illustrates the distribution of property types associated with hoarding and/or squalor related incidents.



**Figure 24: Property Types of All Hoarding and/or Squalor Related Residences**

Most incidents occurred at stand-alone houses or apartments/flats. When analysed separately, hoarding and/or squalor related fires yielded similar findings. Our results were similar

to those found in the 2012 study (Figure 25). This indicates that houses are the most common residence for hoarding and/or squalor related incidents to occur. It is important to note that this study distinguished semi-detached houses from standalone houses when the previous one did not.



(Colpas et al, 2012)

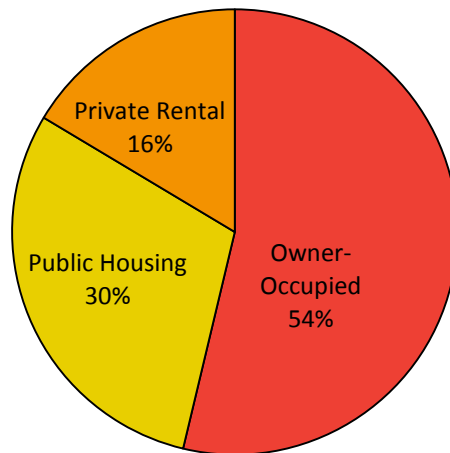
Figure 25: Property Types of Hoarding Households from 2012 Hoarding Study

#### 4.2.5 Property Tenure

**FINDING: Hoarding and/or squalor related incidents occur most frequently in owner-occupied housing.**

Property tenures, can categorised as owner-occupied, private rental, or public housing. The distribution of tenures of all hoarding and/or squalor related incidents from our study is shown below in Figure 26.

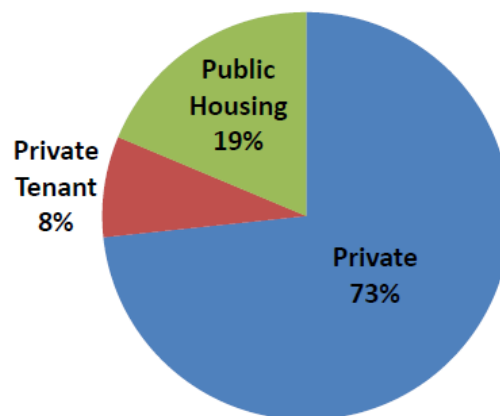




N=67

**Figure 26: Property Tenure of Hoarding and/or Squalor Related Residences**

There were only 67 incidents where the property tenure was identified. This smaller sample is property tenure is not a required field in AIRS, so only a subset of incidents had this data recorded in this field. Owner-occupied housing accounted for the highest proportion of residences in fires (48%) and all incidents (54%). Figure 27 shows property tenure results from the 2012 hoarding study. The findings are very similar in that owner-occupied still accounts for a majority of property tenure. Overall there was a slight increase in public housing and private rentals, but this variation may be due to the small sample sizes.



(Colpas et al, 2012)

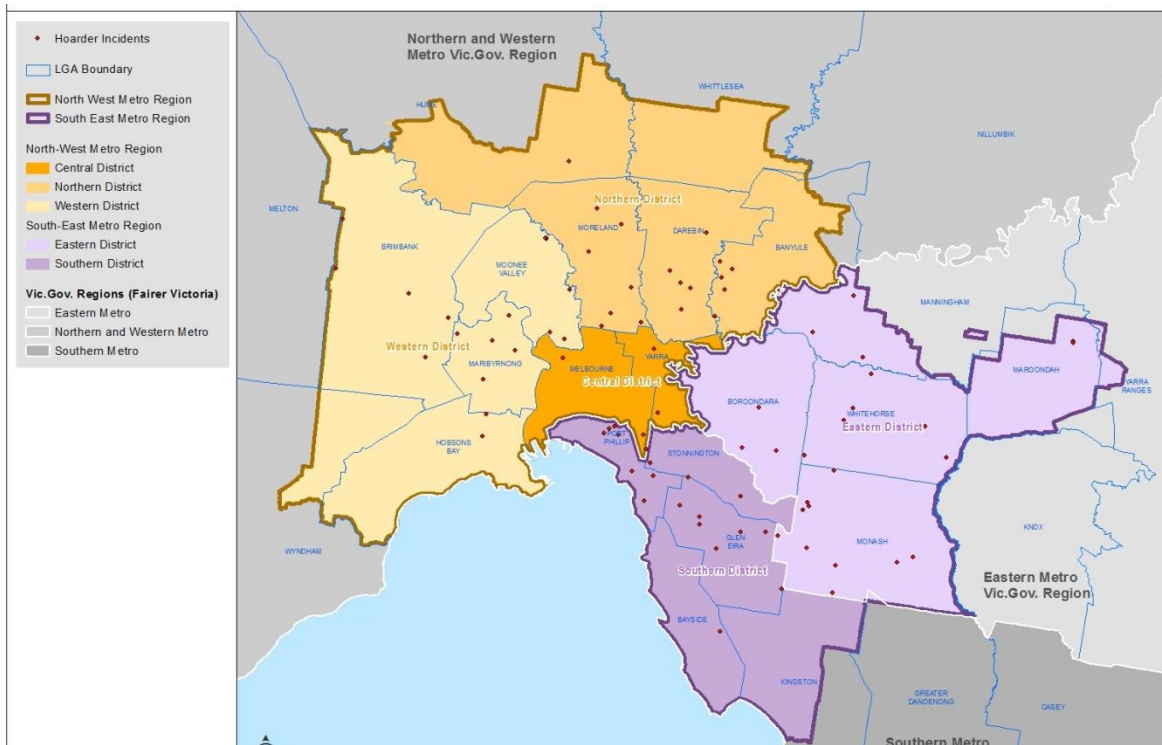
**Figure 27: Property Tenure of Hoarding Residences from 2012 Hoarding Study**

#### 4.2.6 Location

#### **FINDING: Hoarding and squalor incidents occurred in almost every LGA in the MD**

AIRS data contained suburb and local government area (LGA) information about each hoarding/ squalor incident's location. The current study identified 102 confirmed incidents across 66 different suburbs in the Metropolitan District. There were 18 suburbs where more than one incident occurred, ranging from two to five incidents. Of the 24 LGAs that make up the MD, at least one incident has occurred in 19 of them. This is similar to the geographic distribution in the 2012 study and suggests that hoarding and squalor cannot be pinpointed to specific communities or locations.

These suburbs and LGAs represent a wide range of demographic and socioeconomic situations. See Figure 29 for a geographical representation of the distribution of hoarding and/or squalor incidents throughout the MD.

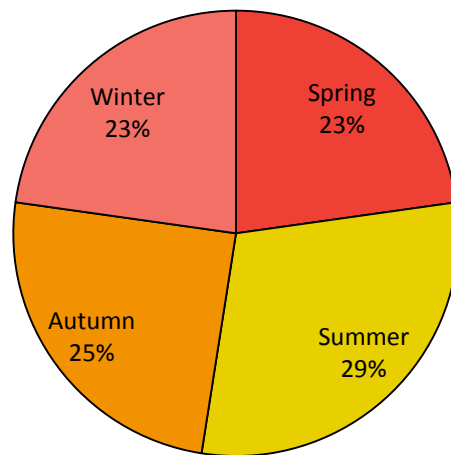


**Figure 28: Hoarding and/or Squalor Related Incidents within the Metropolitan District**

#### 4.2.7 Season

**Finding: Hoarding and/or squalor related incidents are evenly distributed across all four seasons.**

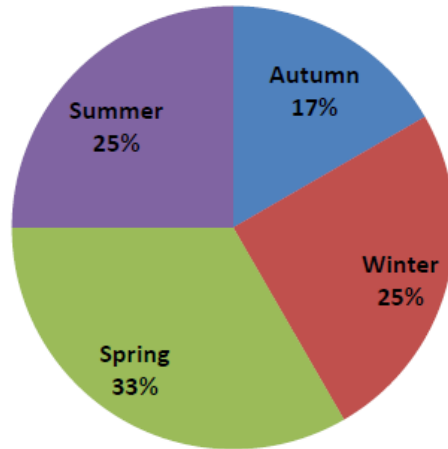
Seasonal distribution was analysed to conclude if activities associated with certain times of the year may influence the occurrence of hoarding and/or squalor related incidents. It was found that hoarding and/or squalor related incidents were evenly distributed across all four seasons as seen below in Figure 29. These findings show that hoarding and/or squalor related incidents are not related to the season.



N=102

**Figure 29: Seasonal Distribution of All Hoarding and/or Squalor Related Incidents**

The distribution was very similar when isolated to fire incidents, suggesting that hoarding and/or squalor related fires and other incidents are not more likely to occur in one specific season. The 2012 hoarding study seasonal results, seen below in Figure 30, had slightly different findings and it could not be determined why this distribution may have occurred. A small sample size may not fully capture the true seasonal distribution.



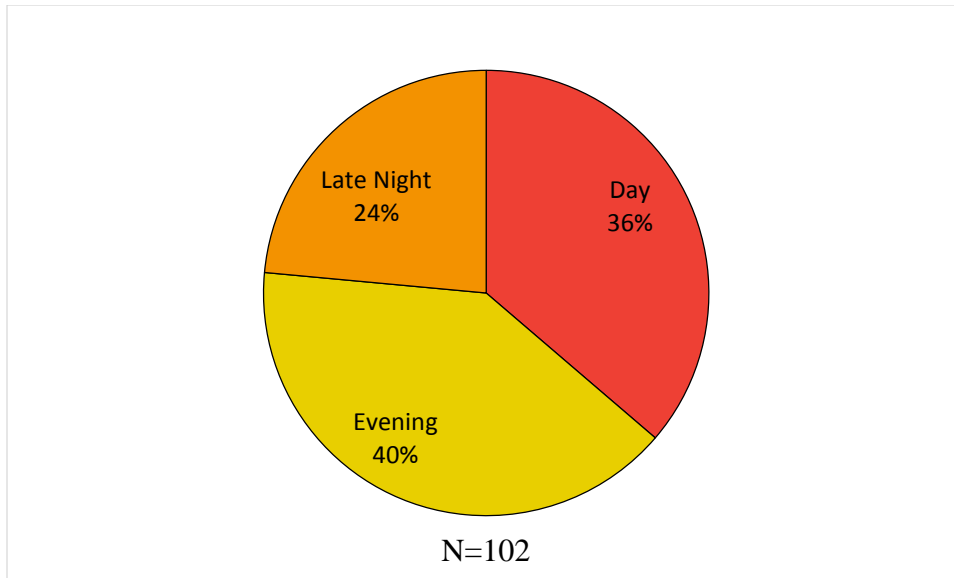
(Colpas et al, 2012)

**Figure 30: Seasonal Distribution of Hoarding Related Fires from 2012 Hoarding Study**

#### **4.2.8 Time of Day**

**FINDING: Hoarding and/or squalor related incidents occur most frequently during day and evening hours while fires occur evenly throughout the day.**

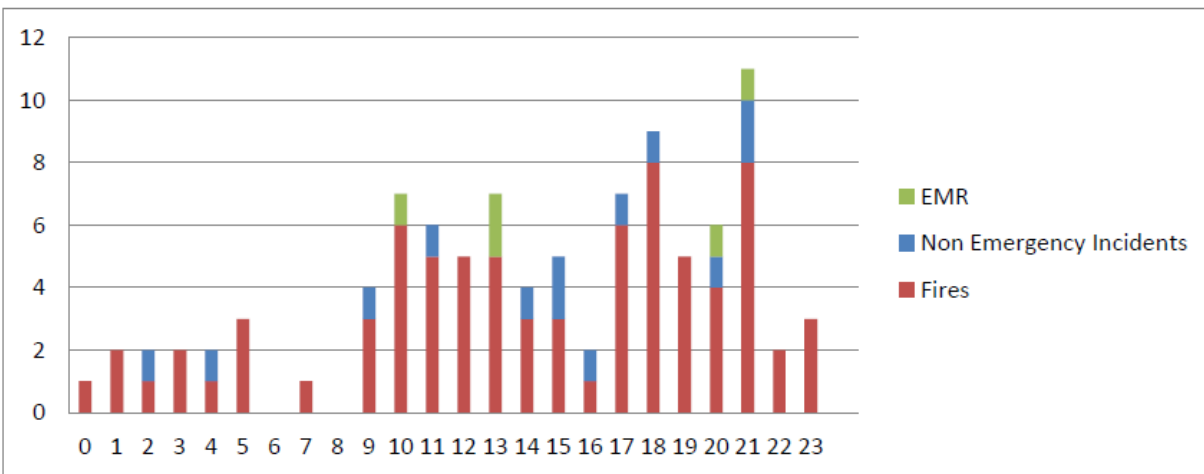
Analysing time of day of hoarding and/or squalor related incidents can help determine if a pattern could be identified of when incidents are more likely to occur. The graph is separated into three categories: day (7 am – 2 pm), evening (2 pm – 11 pm), and late night (11 pm – 7 am). These categories were divided in a way that captured similar activities of daily living and is shown below in Figure 31.



**Figure 31: Time of Day of Hoarding and/or Squalor Related Incidents**

The greatest number of incidents occur in the day and evening hours. Occupants are more likely to be awake and performing various activities of daily living during these times. For example, during day and evening hours, occupants are more likely to experience other incidents such as lock-outs and welfare checks.

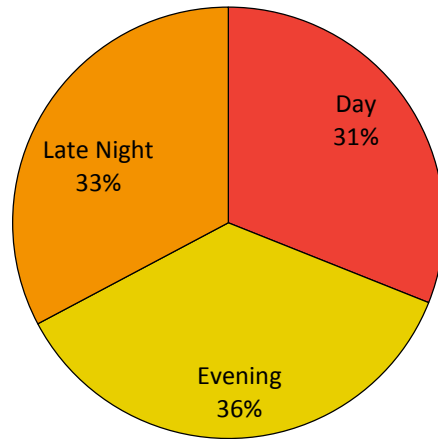
Figure 32 below shows the 2012 hoarding study's distribution of incidents throughout the day. It clearly confirms that a majority of incidents occur during the day and evening hours.



(Colpas et al, 2012)

**Figure 32: Time of Day of Hoarding Related Incidents from 2012 Hoarding Study**

When examining only fire incidents during the Study Period, there was no specific time in which fires occurred more often as shown in Figure 33. This suggests that fire risk is always present in hoarding and/or squalid residences. The discrepancy between fire incidents of this study and the 2012 hoarding could be attributed to the small sample sizes of both studies.



**Figure 33: Time of Day of Hoarding and/or Squalor Related Fires**

#### 4.2.9 Incident Rate

**FINDING: Frequency of identified hoarding and/or squalor incidents is increasing.**

During the Study Period of two years from April 2012 to April 2014, 102 hoarding and/or squalor related incidents occurred. This equates to one incident occurring about every seven days. Figure 34 highlights that this is nearly double the incident occurrence rate identified in the 2012 hoarding study.

Time Frame	Days Between Incidents
2012 Hoarding Study	13.8
2014 Hoarding Study	7.2

**Figure 34: Comparison of Incident Occurrence Rates**

Time Frame	Days Between Incidents
First 12 Months	10.4
Last 12 Months	5.4
Last 6 Months	4.1

**Figure 35: Time Period Breakdown of Incident Occurrence Rate**

Breaking this study into smaller time periods, Figure 35 shows a decrease in days between incidents over the course of our study. The first year of the study had an average of one incident every 10 days while the second year had one incident about every five days. Even more recently, the last six months of this study had an average of an incident every 4 days.

It cannot be proven that the actual number of incidents is increasing, but it does show that the number of reported incidents is increasing dramatically. This higher rate of occurrence of reported hoarding and/or squalor incidents can be attributed to a number of possible influencing factors. First, the scope of this study is greater than that of the 2012 hoarding study. False alarms are a new addition to this study, adding more incidents that could possibly be identified through AIRS. Addresses of identified incidents were also searched to identify multiple incidents that may have occurred at the same address. This was not incorporated in the previous study and provided an additional way to identify more incidents.

MFB's ongoing and active internal and external engagement with stakeholders on the topic of hoarding and squalor may also have contributed to this increased frequency. By educating those who may often encounter hoarding and squalor, it is likely that it will be identified more often and lead to an increase in reporting it when an incident occurs.

#### **4.2.10 Referral Rate**

**FINDING: Referrals were associated with more than 70% of identified incidents.**

**FINDING: Without referrals, only 63 incidents would have been identified.**

Of the 102 identified hoarding and/or squalor related incidents, 71% had an associated referral. This suggests that MFB personnel and external service providers are increasingly acknowledging the risks associated with hoarding and/or squalor and are making referrals to MFB to engage the affected person and the appropriate external agency.

Despite the high proportion of incidents having an associated referral, referrals uniquely identified 38% of the confirmed incidents. In these incidents hoarding and/or squalor was not accurately described or even indicated within an AIRS Report. The incidents were only identified because a referral was made to MFB. Without the referral process that is currently in place now at MFB, only 63 incidents would have been identified through AIRS reports.

#### **4.2.11 Multiple Incidents**

**FINDING: Multiple incidents occurred at approximately one out of every six addresses where hoarding and/or squalor were present.**

Out of the 80 addresses where hoarding and/or squalor incidents occurred, over the two year time frame of this study, thirteen had multiple incidents, or 16%, with a combined 35 incidents in total at those thirteen addresses. Until the hoarding and/or squalor risks are addressed, fire and safety hazards present a threat to the occupants, neighbours, and responding firefighters in the event of an emergency. At one address, there was a total of nine incidents, and there were four addresses with three or more incidents each.

#### **4.1.12 Emergency Response Incidents Involving a Deceased Person in a Home with Hoarding and/or Squalor**

Of the 102 incidents involving hoarding and/or squalor this study identified, seven incidents involved people who were deceased at the scene. Only one of these incidents involved a preventable residential fire fatality with hoarding and squalor. These types of incidents were not reported in the previous two studies as data was not available. This information is a result of increased reporting by firefighters of all incidents involving hoarding and squalor. These particular incidents are described below.

- Emergency Medical Response:
  - Adult male occupant living in a home with other adults
  - Hoarding at level seven on CIR
  - Access compromised due to hoarding
  
- Fire Incident:
  - Adult female living alone
  - Hoarding at level six or seven on CIR with squalor present
  
- Emergency Medical Response:
  - Adult female occupant living in a home with another adult
  - Hoarding at level seven to nine on CIR
  - Access compromised due to hoarding
  
- Assist Ambulance Victoria:
  - adult female occupant living alone,
  - hoarding at level seven to nine on CIR
  - Access compromised due to hoarding
  
- Assist Victoria Police:



- Adult male occupant living with other adults
- Hoarding at level seven to nine on CIR
- Access compromised due to hoarding
  
- Emergency Medical Response:
  - Adult male patient living alone
  - Hoarding at level seven on CIR
  - Access compromised due to hoarding
  
- Emergency Medical Response:
  - Adult female patient living alone
  - Hoarding at level seven on CIR with squalor
  - Access compromised due to hoarding

All these incidents involve a significant level of hoarding. Most of the people lived alone. While some incidents involved younger adults they primarily involved adults aged over 65. These examples demonstrate the effect of hoarding and/or squalor on other types of emergency incidents and that these challenges confront other emergency responders such as police and ambulance. In time critical incidents compromised access can delay a range of emergency responses and potentially change the outcome for people living in affected homes.

#### **4.2.13 Hoarding Notification System**

**FINDING: Only about one out of every six addresses where a hoarding related incident occurred in the Study Period, is included in the Hoarding Notification System.**

Out of the 75 hoarding residences in the MD identified in this study, only eight are included in the HNS (16%) and only one of the twelve addresses with multiple incidents is included (8.3%).

Hoarding households pose more risks to firefighters than other residential fires due to the higher fuel load, highly combustible materials, and narrow pathways. The HNS was created to enable an enhanced level of operational response to fires at or within 40m of a hoarding household due to the increased risks presented by these types of households. Criteria for adding identified hoarding properties to the HNS is simple: The property must be within the MD, contain hoarding (level five or above on the CIR scale), and have a minimum of one working smoke alarm. As this study reinforced, the presence of a working smoke alarm is lacking in the majority of hoarding and/or squalor residences. The inclusion of this requirement ensures that

every address to be submitted to the HNS, has to have a smoke alarm installed if there is not one already present, which increases the safety of the occupants.

While MFB promotes the HNS with referrals and through engagement with support and intervention agencies after an incident, there is no requirement for any agency or individual to participate. MFB is currently receiving an increasing number of notifications on a weekly basis from individuals and agencies. As identified in this study, the majority are unrelated to incidents attended by MFB.

### **4.3 Results Summary**

Our results reinforce and emphasize the severity and prevalence of hoarding and/or squalor and their associated risks. Demographic information, for the most part, was shown to remain relatively the same over all three studies. The results showed a greater number of older adults being associated with hoarding and/or squalor related incidents. The study confirmed there were no other common demographic features linking affected people in any way other than by hoarding and/or squalor. In addition, these incidents were not able to be related to any particular time of day, season, or geographic region. Smoke alarm compliance has increased as has containment to room of origin since the last two studies. Our results show a large increase in the reporting of hoarding and/or squalor related non-structure fires, as well as an overall increase in reporting of all hoarding and/or squalor related incidents. This rate of reported incidents, even within the course of the Study Period, rose from one incident every nine days to one incident every four days on average from the first six months to the last six months of the study respectively.

## **Chapter 5: Conclusions and Recommendations**

A significant body of evidence has been generated from the research and analysis of 15 years of data in the hoarding and/or squalor studies completed in 2009, 2012, and 2014. The current 2014 study reconfirms that hoarding and/or squalor incidents can occur in any location, property type, or property tenure. Results from the 2014 study also substantiate that hoarding is a significant and severe risk. The increasing rate of reported incidents establishes hoarding and squalor as ongoing risk issues for affected individuals and the community. This chapter is will confirm our findings, confirm the risk and recommend actions with potential treatments which can be applied in the MD and other jurisdictions both in Australia and overseas.

### **5.1 Conclusions**

#### ***Confirmation of Findings from Previous Studies***

This study showed that nearly 80 per cent of Local Government Areas (LGA) in the MD had at least one hoarding and/or squalor incident occur within its boundaries. This confirms that hoarding and/or squalor related incidents are not confined or common to one suburb or even one LGA and can occur anywhere in the MD.

This study also identified that while the majority of hoarding related fires originated inside a residence, fires occurring outside the home within the boundary of a property have significantly increased from one non-structure fire in three years (2012 study) to 14 non-structure fires in two years (2014 study). While this may be attributable to the overall increased rate of reporting, this information is still a concern to local government who have responsibility in the areas of fire prevention and local laws. An increase in fires involving hoarding in the front or rear yard of a residential property may indicate a previously unreported risk.

This study also identified MFB's attendance at seven hoarding and/or squalor related incidents involving a deceased person. While the previous two studies have only identified fire related fatalities, only one of the deaths in our study involved a fire. This information may provide the basis for more research to better understand the circumstances and any interventions that could have contributed to a different outcome.

The results from this study also confirmed the findings of the 2012 study in that the majority of incidents occurred in owner-occupied stand-alone homes. The remainder of the property types and tenures were fairly evenly distributed between apartments and semidetached homes, and public housing and private rental respectively. This distribution indicates that any home with hoarding and/or squalor present is subject to the same high fire risk.

It was shown in this study that the highest rate of fires occurred during the day and evening hours. This finding contrasted with the results from the 2012 study which showed that the highest rate of fires occurred in the morning to mid-day and evening hours. These results indicate that hoarding and/or squalor related fires can occur at any time of the day.

### ***Confirmation of Risk***

It was found that MFB has been able to increase its containment rate of hoarding fires to the room of origin from 40% to 70% over the past five years. However, the rate observed in this study is still 20% less than MFB's overall containment rate for residential fires. This is likely due to the additional challenges hoarding fires present to firefighters such as reduced access and high fuel load.

The incident identification rate has doubled since the 2012 study. In the first six months of this study, an incident occurred approximately every nine days. In the last six months, the incident rate has increased to approximately one incident every four days.

Reasons for this increase could be attributed to increased engagement with firefighters. MFB has been actively promoting awareness of hoarding and squalor to firefighters to increase their understanding of the associated risks and complications of hoarding and/or squalor incidents and to stress the importance of reporting these incidents. Another possible reason for increased incident rate in this study may be due to the broader search area which included false alarms and multiple incidents at the same address. From this information, it is possible to conclude that either the incident rate is increasing or incident reporting is increasing.

According to the Department of Planning and Community Development's report *Victoria in Future 2012*, the average age in Melbourne is steadily increasing and people on average are living longer (2012). As reinforced by this study, the majority of people affected by hoarding

and/or squalor are 65 years or older. The convergence of these trends may be contributing currently and is certainly expected to contribute in the future.

Multiple incidents occurred at approximately one out of every six hoarding and/or squalor residences identified in this study. Having multiple incidents at a hoarding and/or squalor residence demonstrates the ongoing risk to occupants and the need to appropriately refer and support affected people.

MFB has developed research, policy, and practice and engaged external stakeholders, but gaps still exist in internal and external knowledge and practices. The following recommendations are provided to support increased reporting, knowledge, and shared practice.

## **5.2 Recommendations**

### ***Recommendation #1:***

MFB continue to promote the Hoarding Notification System (HNS) with external agencies as a proactive and measurable way to increase the fire safety of the occupants, neighbors, and responding firefighters. The HNS can be progressed by external agencies engaging people affected by hoarding and/or squalor for consent to refer as this will also raise individual awareness of the inherent fire risks of hoarding and fire safety in the home.

### ***Recommendation #2:***

Both previous WPI/MFB hoarding studies have recommended a change to AIRS such as the inclusion of a drop down box with the Clutter Image Rating (CIR) scale in the description field of AIRS to increase reporting of hoarding incidents. This study recommends training and education for firefighters about hoarding and squalor to increase reporting of these incidents in AIRS in all states and territories.

Changes to AIRS not only requires agreement by all states and territories, but also evidence to support an imperative for change. At the time of compiling this study, MFB is the only fire service in Australia to actively collect data and develop research related to hoarding and/or squalor related incidents. This can be attributed in part to the more recent emergence of the relationship between hoarding, squalor, risk and the capacity of fire services to capture and collect more detailed situational information about individual incidents. With hoarding alone

predicted to affect between three to five per cent of the general population and its risk status confirmed by this study and the previous two WPI/MFB studies, a case has been established for fire services to consider an integrated multi-agency initiative to measure and monitor prevalence in all jurisdictions. It is recommended that fire services develop a package of information for firefighters about hoarding and squalor and their associated risks. This information combined with simple tools and language through which hoarding and squalor can be described and the recommendation they be recorded in the description field of AIRS will provide a more accurate incident rate. To maximise efficiencies in delivery and consistency of the information to and for firefighters, consideration should be given to developing this information electronically.

If increased reporting does occur and provides a basis upon which to consider the inclusion of drop down boxes in the description field of AIRS for hoarding and squalor, further development is required. While CIR has been previously suggested for inclusion in a drop down box for hoarding, no similar visual tool exists to identify squalor. Although hoarding can be simply identified through volume, squalor which may or may not also include hoarding, has a range of different features. These may be best identified through a drop down box with a series of word prompts such as *rotting*, *organic matter*, or *unsanitary living environment*.

Our recommendations are that:

- MFB and fire services in other jurisdictions work in collaboration to develop information for firefighters about:
  - Hoarding, squalor, and risk
  - How to identify and describe hoarding and squalor
  - How to report this via the AIRS description box
  - Commit to a roll out of this information to firefighters in all jurisdictions
- AIRS is monitored to identify reporting of hoarding and squalor incidents in the description box of AIRS
- If reporting is increased in AIRS, consideration be given to providing drop down boxes to denote hoarding and/or squalor
- That fire services in other countries seeking to quantify the rate of hoarding incidents in their jurisdictions, engage firefighters directly with information and language to describe

hoarding and/or squalor and provide a clear pathway for it to be reported within their own fire service

***Recommendation #3:***

MFB set up a process through which AIRS data related to residential fires is searched for the key words used to describe hoarding and squalor. The regular collection of this information will provide MFB with a current and consistent ability to measure the incident rate and types of incidents involving hoarding and/or squalor.

***Recommendation #4:***

MFB continue to seek opportunities in which to engage key stakeholders to further develop shared practice and responses. The engagement of key stakeholders will provide information, industry best practices, and the most efficient interagency response. This engagement of stakeholders will provide the best possible outcome for people affected by hoarding and/or squalor.

## Works Cited

- American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition*. Arlington, VA: American Psychiatric Association.
- Atfield, C. (2013). Man charged with Kyhessa-Lee's manslaughter free on bail, *Brisbane Times*. Retrieved from <http://www.brisbanetimes.com.au/queensland/man-charged-with-kyheshalees-manslaughter-free-on-bail-20130525-2n3ah.html>
- Banerjee, S., Halliday, G., & Snowden, J. (2012). *Severe Domestic Squalor*.
- Children of Hoarders. Retrieved April 25, 2014, from <http://childrenofhoarders.com/wordpress/>
- Colpas, E., de Zulueta, J., & Pappas, D. (2012). An Analysis of Hoarding Fire Incidents and MFB Organisational Response.
- Deery, S., & Hurley, D. (2014). Mum pleads guilty after boy dies from a cut on his foot in his filthy, rat-infested house in Melbourne, *Herald Sun*. Retrieved from <http://www.heraldsun.com.au/news/law-order/mum-pleads-guilty-after-boy-dies-from-a-cut-on-his-foot-in-his-filthy-ratinfested-house-in-melbourne/story-fni0fee2-1226860477798>
- Department of Planning and Community Development (2012). *Victoria in Future 2012*.
- Flanagan, J. (2014). [Email].
- Frost, R. O., & Hartl, T. (1996). A cognitive-behavioral model of compulsive hoarding. *Behavior Research and Therapy*.
- Frost, R. O., & Steketee, G. (2010). *Stuff*. New York, New York: Houghton Mifflin Harcourt Publishing Company.
- International OCD Foundation. (2013). About Hoarding.
- Kyrios, M. (2012). When Stuff gets in the Way of Life. In M. I. F. N. Inc (Ed.).
- Lucini, G., Monk, I., & Szlatnyi, C. (2009). An Analysis of Fire Incidents involving Hoarding Households.
- Macfarlane, S. (2013). Neuropsychology of Squalor.
- Macfarlane, S. (2014). [Squalor].
- MFB. (2014a). *Community Resilience Recommended Practice*.
- MFB. (2014b). MFB Web Page. from <http://www.mfb.vic.gov.au/>
- Misiaszek, B. (n.d.). Diogenes Syndrome, A Geriatric syndrome of gross self neglect.
- Mogan, C. (2009). The Psychology of Compulsive Hoarding.
- National Health Service UK. (2013). Compulsive Hoarding.
- News.com.au. (2012). Tampered smoke alarms factor in fire deaths, coronial inquest finds. 2014, from <http://www.news.com.au/national/tampered-smoke-alarms-factor-in-fire-deaths->



coronial-inquest-finds/story-e6frfkp9-1226412715960

Tolin, D. F. (2011). Challenges and advances in treating hoarding. *Journal of Clinical Psychology, 67*(5), 451-455. doi: 10.1002/jclp.20796

Victoria Department of Health. (2012). *Discussion Paper Hoarding and Squalor*. Melbourne, Victoria, Australia: Ageing and Aged Care Branch.

Victoria Department of Health. (2013). *Hoarding and Squalor A Practical Resource for Service Providers*. Melbourne, Victoria, Australia: Victorian Government.

## Appendix A: Clutter Image Rating

### Clutter Image Rating Scale: Kitchen

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



1



2



3



4



5



6



7



8



9

(International OCD Foundation, 2013)

## Clutter Image Rating: Bedroom

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



1



2



3



4



5



6



7



8



9

(International OCD Foundation, 2013)

## Clutter Image Rating: Living Room

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



1



2



3



4



5



6



7



8



9

(International OCD Foundation, 2013)

## Appendix B: Keyword Search Information

For the purpose of this keyword search information, the following abbreviations were used in column headers:

- **Instances:** The number of AIRS reports which used the keyword at least one time. This is not the number of instances of the word in that if a single AIRS report used the keyword more than one time, it was still only counted as once instance.
- **H:** The number of confirmed hoarding (no squalor) incidents found in AIRS reports through the use of the keyword.
- **S:** The number of confirmed squalor (no hoarding) incidents found in AIRS reports through the use of the keyword.
- **H&S:** The number of AIRS reports which used the keyword at least one time and produced a confirmed hoarding and squalor residence.
- **New:** Lists "x" if the keyword was not used in either/both of the previous studies (2009 and 2012).

This appendix is split into five sub-appendices which cover the following information:

- **B.1: Keyword Listing with Categories:** This lists every keyword the team searched for and every category the team used to categorize words. Each keyword is assigned to a main category denoted by the "X" and any other categories that it could be considered to be a part of are denoted by a "x".
- **B.2: Keyword Database:** This is the main listing of keyword search information. The keywords are listed in groupings which relate to their main category, as listed in Appendix B.1. This database lists the number of instances of a keyword and the associated confirmed number of incidents of hoarding and/or squalor. Information regarding if the keyword is new to our study is also listed as well as any relevant notes regarding the keyword.
- **B.3: Keywords Producing Confirmed Incidents of Hoarding and/or Squalor Ranked by Number of Incidents Produced:** This listing contains only the keywords which produced instances of hoarding and/or squalor and is ranked by the total number of confirmed incidents each keyword produced.
- **B.4: Keywords by Success Rate:** This listing contains every keyword the team searched for listed by the "success rate" of each keyword. The success rate was a ratio of the total number of instances (as defined above) to the number of confirmed instances of hoarding and/or squalor related to that keyword.
- **B.5: Excluded Keywords:** This listing explains each keyword that was used in the 2009 and/or 2012 study which was not used in our study and the reason why it was excluded.

The total number of instances and number of confirmed instances of hoarding and/or squalor as listed in each portion of this appendix is associated with only the original AIRS data set which did not include false alarms or data after 20 March 2014. The number of instances found through the subsequent two data sets (false alarms and 20 March 2014 - 3 April 2014) was minimal compared to this original dataset which produced the vast majority of results.

**Appendix B.1: Keyword Listing with Categories**

	Access Issues	Storage of Materials	Quantity	Variations of "Hoarding"	Variations of "Bric A Brack"	Smell	Animals and Pests	Household Neglect and Waste - Dry	Household Neglect and Waste - Wet	Mental Health and Community Services	Materials	Variations of "Squalor"	Hygiene
<b>*aces*</b>	X												
<b>*bric-</b>					X								
<b>*bric*-</b>					X								
<b>*bric*a</b>					X								
<b>*brica</b>					X								
<b>*brick-</b>					X								
<b>*brick*-</b>					X								
<b>*brick*-</b>					X								
<b>*brick*a*</b>					X								
<b>*bricka</b>					X								
<b>*brik*</b>					X								
<b>Abnormal</b>			X										
<b>Abundance</b>			X										
<b>Access +Hard OR difficult OR poor OR "no access" OR lack</b>	X												
<b>Accumulat</b>		X	x					x					
<b>Acess</b>	X												
<b>Acrid</b>						X		x					
<b>Ad hoc</b>								X					
<b>Amount + significant OR large OR excess OR huge OR enormous</b>		x	X										
<b>Anormal</b>			X					x					

Bad electrical wiring														
	Access Issues	Storage of Materials	Quantity	Variations of "Hoarding"	Variations of "Bric A Brack"	Smell	Animals and Pests	Household Neglect and Waste - Dry	Household Neglect and Waste - Wet	Mental Health and Community Services	Materials	Variations of "Squalor"	Hygiene	
Blocked	X	x	x											
Blocking	X	x	x											
Boxes											X			
Breach of								x		X				
Cans											X			
Chattel								x			X			
Closed off	X	x												
Cluter											X			
Clutter											X			
Clutter Image Rating Scale			x							X				
Collection		x	x								X			
Community care										X				
Comunity care										X				
Cotents											X			
Debris								x			X			
Decay									X					
Decompos									X					
Defication														X
Dementia										X				
Deny help										X				
Depravity								X						
Dingy								X						
Dirt														X
Discarded		x						x	x		X			
Disgusting								X	x					



<b>Egress +Hard OR +difficult OR + poor</b>	<b>X</b>													
	<b>Access Issues</b>	<b>Storage of Materials</b>	<b>Quantity</b>	<b>Variations of "Hoarding"</b>	<b>Variations of "Bric A Brack"</b>	<b>Smell</b>	<b>Animals and Pests</b>	<b>Household Neglect and Waste - Dry</b>	<b>Household Neglect and Waste - Wet</b>	<b>Mental Health and Community Services</b>	<b>Materials</b>	<b>Variations of "Squalor"</b>	<b>Hygiene</b>	
<b>Encroach</b>	<b>X</b>	x												
<b>Excess</b>		x	<b>X</b>											
<b>Faeces</b>									x				<b>X</b>	
<b>Feces</b>									x				<b>X</b>	
<b>Filled with</b>	x	<b>X</b>	x											
<b>Filth</b>								<b>X</b>	x					
<b>Fire load</b>											<b>X</b>			
<b>Food scrap</b>									<b>X</b>		x			
<b>Foul</b>						<b>X</b>			x					
<b>Fuel load</b>											<b>X</b>			
<b>Full of items</b>		x	<b>X</b>					x						
<b>Garbage</b>								x	x		<b>X</b>			
<b>Goods</b>											<b>X</b>			
<b>Grime</b>									<b>X</b>					
<b>Hampered</b>	<b>X</b>													
<b>Haord</b>				<b>X</b>										
<b>Heavily loaded</b>		x	<b>X</b>											
<b>High level of</b>			<b>X</b>											
<b>Hoar</b>				<b>X</b>										
<b>Hord</b>				<b>X</b>										
<b>Hored</b>				<b>X</b>										
<b>Hovel</b>												<b>X</b>		
<b>Hygene</b>													<b>X</b>	
<b>Hygiene</b>													<b>X</b>	
<b>Impede</b>	<b>X</b>													
<b>Impeed</b>	<b>X</b>													
<b>Insects</b>							<b>X</b>		x					

Jnk								x			X		
Julie Harris											X		
Junk								x			X		
	Access Issues	Storage of Materials	Quantity	Variations of "Hoarding"	Variations of "Bric A Brack"	Smell	Animals and Pests	Household Neglect and Waste - Dry	Household Neglect and Waste - Wet	Mental Health and Community Services	Materials	Variations of "Squalor"	Hygiene
Lack of maintenance								X					
Limited	X												
Lined		X	x										
Local council										X			
Many animals							X						
Memorabilia											X		
Mental health										X			
Messy								X					
Mice							X		x				
Mold									X				
Mould									X				
Muck									X				
Multitude			X										
Narrow	X	x						x					
Neglect								X		x			
Notification pack										X			
Organic matter									X		x		
Pile		X											
Poor								X					
Pungent						X			x				
Putrid						X			x				
Rat Infested							X						
Rat-infested							X						

Rats							X						
Refer										X			
Refuse										X			
Resistance	X									x			
	Access Issues	Storage of Materials	Quantity	Variations of "Hoarding"	Variations of "Bric A Brack"	Smell	Animals and Pests	Household Neglect and Waste - Dry	Household Neglect and Waste - Wet	Mental Health and Community Services	Materials	Variations of "Squalor"	Hygiene
Rotten									X				
Rotting									X				
Rubbish - "rubbish truck" - "chute" - "rubbish bin" - "small rubbish fire" - "bin of rubbish" - "small amount of rubbish" - "bins of rubbish"								x			X		
Rubish								x			X		
Ruvbbish								x			X		
Shabby								X					
Sickening						x			X				x
Small Path	X	x											
Smelly						X							x
Smelt						X							
Soiled									x				X
Spoiled food									X		x		
Spoilt									X				
Sqalor												X	
Squalid												X	
Squallid												X	

	Access Issues	Storage of Materials	Quantity	Variations of "Hoarding"	Variations of "Bric A Brack"	Smell	Animals and Pests	Household Neglect and Waste - Dry	Household Neglect and Waste - Wet	Mental Health and Community Services	Materials	Variations of "Squalor"	Hygiene
<b>Squalor</b>												<b>X</b>	
<b>Squalour</b>												<b>X</b>	
<b>Stack</b>		<b>X</b>											
<b>Stink</b>						<b>X</b>							
<b>Stock</b>		<b>X</b>											
<b>Storage items</b>											<b>X</b>		
<b>Stored</b>		<b>X</b>											
<b>Storred</b>		<b>X</b>											
<b>Strewn</b>		x						<b>X</b>					
<b>Unable to organise</b>		x						<b>X</b>					
<b>Unable to organize</b>		x						<b>X</b>					
<b>Unclean</b>		x						<b>X</b>					
<b>Unhygienic</b>									x				<b>X</b>
<b>Unkept</b>		x						<b>X</b>					
<b>Unorthodox</b>								<b>X</b>		x			
<b>Unsanitary</b>													<b>X</b>
<b>Untidy</b>		x						<b>X</b>					
<b>Urine</b>						x							<b>X</b>
<b>Vermin</b>							<b>X</b>						
<b>Volume of Items</b>	x	x	<b>X</b>										
<b>Volume of Materials</b>	x	x	<b>X</b>										
<b>Wreched</b>						x			<b>X</b>				

## Appendix B.2: Keyword Database

Storage of Materials						
Keyword	Instances	H	S	H&S	New	Notes
Accumulat	13	0	0	0	x	Captures "accumulate", "accumulated", and "accumulating".
Clutter	4	1	0	1	x	
Filled with	61	1	0	0	x	
Lined	58	0	0	0	x	
Pile	235	4	0	0	x	Captures "piled", "piles", and "piles of".
Stack	60	1	0	0	x	Captures "stacks", "stacked", and "stacking".
Stock	23	0	0	0		
Stored	125	1	0	1		
Storred	0	0	0	0		Misspelling of "stored".

Quantity						
Keyword	Instances	H	S	H&S	New	Notes
Abnormal	10	0	0	0		
Abundance	0	0	0	0	x	
Amount + significant OR large OR excess OR huge OR enormous	145	1	0	0	x	Produced too many results with just the term "amount". Refined to results that included amount and at least one of the following: "significant", "large", "excess", "huge", "enormous".
Anormal	0	0	0	0		
Excess	87	0	0	0	x	
Full of items	0	0	0	0	x	
Heavily loaded	0	0	0	0	x	
High level of	3	0	0	0	x	
Multitude	1	0	0	0	x	
Volume of items	0	0	0	0	x	
Volume of materials	0	0	0	0	x	

Variations of Hoarding						
Keyword	Instances	H	S	H&S	New	Notes
Haord	0	0	0	0	x	Misspelling of "hoard".
Hoar	41	31	0	4		Captures "hoarder", "hoarding", "hoarded".
Hord	3	1	0	0	x	Captures "horder", "hording", and "horded", which are all possible misspellings.
Hored	7	0	0	0	x	Captures "horeder", "horeding", "horeded", which are all possible misspellings.

Variations of Brick-a-Brack						
Keyword	Instances	H	S	H&S	New	Notes
*bric-	1	1	0	0		* denotes a space. These variations were used to attempt to capture a multitude of ways in which "Brick a brack" could be written.
*bric*-	0	0	0	0		
*bric*a	0	0	0	0		
*brica	0	0	0	0		
*brick-	1	0	0	0		
*brick*-	0	0	0	0		
*brick*-	0	0	0	0		
*brick*a*	0	0	0	0		
*bricka	0	0	0	0		
*brik*	0	0	0	0		

Smell						
Keyword	Instances	H	S	H&S	New	Notes
Smelly	0	0	0	0	x	
Smelt	64	0	0	0	x	
Pungent	8	0	0	0	x	
Acrid	2	0	0	0	x	
Stink	2	0	0	0	x	
Foul	1	0	0	0	x	
Putrid	0	0	0	0	x	

<b>Animals and Pests</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Vermin</b>	2	0	0	0	x	
<b>Mice</b>	4	0	0	0	x	
<b>Rats</b>	1	0	0	0	x	
<b>Insects</b>	0	0	0	0	x	
<b>Many animals</b>	0	0	0	0	x	
<b>Rat-infested</b>	0	0	0	0	x	
<b>Rat Infested</b>	0	0	0	0	x	

<b>Household Neglect and Waste - Dry</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Ad hoc</b>	0	0	0	0	x	
<b>Bad electrical wiring</b>	0	0	0	0	x	
<b>Depravity</b>	0	0	0	0	x	
<b>Dingy</b>	0	0	0	0	x	
<b>Disgusting</b>	0	0	0	0	x	
<b>Filth</b>	2	0	1	0	x	Both results used the term "filthy".
<b>Lack of maintenance</b>	12	0	0	0	x	
<b>Messy</b>	0	0	0	0	x	
<b>Neglect</b>	3	0	0	0	x	
<b>Poor</b>	49	0	0	1	x	
<b>Shabby</b>	1	0	0	0	x	
<b>Strewn</b>	4	0	0	0	x	
<b>Unable to organise</b>	0	0	0	0	x	
<b>Unable to organize</b>	0	0	0	0	x	
<b>Unclean</b>	1	0	0	0	x	
<b>Unkept</b>	0	0	0	0	x	
<b>Unorthodox</b>	0	0	0	0	x	
<b>Untidy</b>	1	0	1	0	x	

<b>Mental Health &amp; Community Services</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Breach of</b>	3	0	0	0	x	Meant to capture "breach of code" and "breach of regulation" because of abnormal and dangerous living conditions.
<b>Clutter Image Rating Scale</b>	0	0	0	0	x	
<b>Community care</b>	4	1	0	0	x	
<b>Comunity care</b>	0	0	0	0	x	
<b>Dementia</b>	18	1	0	0	x	
<b>Deny help</b>	0	0	0	0		
<b>Julie Harris</b>	6	2	0	2	x	The name of the MFB Community Resilience Department contact person for hoarding.
<b>Local council</b>	100	0	0	1		
<b>Mental health</b>	8	0	1	0	x	
<b>Notification pack</b>	0	0	0	0	x	
<b>Refer</b>	81	1	0	0		Most cases found by searching for "refer" said "EMR refer PCR". The PCR, or Patient Care Report, is a separate report completed by the medical providers for all EMR calls, and the team did not have access to these reports. Within the AIRS report, any information besides "EMR refer to the PCR" was rarely provided. This is a major source of underrepresentation of EMR calls within our study.
<b>Refuse</b>	0	0	0	0	x	

<b>Variations of Squalor</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Hovel</b>	0	0	0	0	x	
<b>Sqalor</b>	0	0	0	0		A possible misspelling of "squalor".
<b>Squalid</b>	0	0	0	0	x	
<b>Squallid</b>	1	0	0	1	x	A possible misspelling of "squalid".
<b>Squalor</b>	0	0	0	0		
<b>Squalour</b>	0	0	0	0	x	A possible misspelling of "squalor".



<b>Hygiene</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Defecation</b>	0	0	0	0	x	
<b>Dirt</b>	42	0	0	0	x	
<b>Faeces</b>	3	0	0	0	x	
<b>Feces</b>	0	0	0	0	x	
<b>Hygene</b>	0	0	0	0		Misspelling of "hygiene".
<b>Hygiene</b>	0	0	0	0		
<b>Soiled</b>	2	0	0	0	x	
<b>Unhygienic</b>	0	0	0	0	x	
<b>Unsanitary</b>	0	0	0	0		
<b>Urine</b>	5	0	0	1	x	

<b>Household Neglect and Waste - Wet</b>						
<b>Keyword</b>	<b>Instances</b>	<b>H</b>	<b>S</b>	<b>H&amp;S</b>	<b>New</b>	<b>Notes</b>
<b>Food scrap</b>	3	0	0	0	x	
<b>Decompos</b>	6	0	0	0	x	Captures "decompose", "decomposed", "decomposing", and "decomposition".
<b>Spoilt</b>	0	0	0	0	x	
<b>Spoiled food</b>	0	0	0	0	x	
<b>Grime</b>	1	0	0	0	x	
<b>Mold</b>	1	0	0	0	x	
<b>Sickening</b>	0	0	0	0	x	
<b>Wreched</b>	0	0	0	0	x	
<b>Rotting</b>	2	0	0	0	x	
<b>Rotten</b>	5	0	0	0	x	
<b>Decay</b>	1	0	0	0	x	
<b>Mould</b>	2	0	0	0	x	
<b>Muck</b>	0	0	0	0	x	
<b>Organic matter</b>	0	0	0	0	x	

Materials						
Keyword	Instances	H	S	H&S	New	Notes
<b>Boxes</b>	50	0	0	1	x	
<b>Cans</b>	44	0	0	0		
<b>Chattel</b>	0	0	0	0	x	
<b>Cluter</b>	1	1	0	0		Misspelling of "clutter".
<b>Collection</b>	40	0	0	0		
<b>Cotents</b>	0	0	0	0		Misspelling of "contents".
<b>Debris</b>	259	1	0	0	x	
<b>Discarded</b>	0	0	0	0		
<b>Fire load</b>	7	2	0	0		
<b>Fuel load</b>	8	1	0	0		
<b>Garbage</b>	58	0	0	0		
<b>Goods</b>	24	0	0	0		
<b>Jnk</b>	0	0	0	0		Misspelling "junk".
<b>Junk</b>	5	2	0	0		
<b>Memorabilia</b>	0	0	0	0		
<b>Rubbish - "rubbish truck" - "chute" - "rubbish bin" - "small rubbish fire" - "bin of rubbish" - "small amount of rubbish" - "bins of rubbish"</b>	587	6	0	2		Filtered to exclude "rubbish truck", "chute", "rubbish bin", "small rubbish fire", "bin of rubbish", "small amount of rubbish", and "bins of rubbish" which were common uses of the word rubbish the team believed would not be used in relation to hoarding and/or squalor.
<b>Rubish</b>	37	0	0	0		Misspelling of "rubbish".
<b>Ruvbbish</b>	1	0	0	0	x	Misspelling of "rubbish".
<b>Storage items</b>	0	0	0	0	x	

**Appendix B.3: Keywords Producing Confirmed Incidents of Hoarding and/or Squalor  
Ranked by Number of Incidents Produced**

<b>Keyword</b>	<b>Instances</b>	<b>Hoarding</b>	<b>Squalor</b>	<b>H&amp;S</b>	<b>Total</b>
<b>Hoar</b>	41	31	0	4	35
<b>Rubbish - "rubbish truck" - "chute" - "rubbish bin" - "small rubbish fire" - "bin of rubbish" - "small amount of rubbish" - "bins of rubbish"</b>	587	6	0	2	8
<b>Julie Harris</b>	6	2	0	2	4
<b>Access +Hard OR difficult OR poor OR "no access" OR lack</b>	92	3	0	1	4
<b>Pile</b>	235	4	0	0	4
<b>Blocked</b>	140	2	0	1	3
<b>Clutter</b>	4	1	0	1	2
<b>Junk</b>	5	2	0	0	2
<b>Fire load</b>	7	2	0	0	2
<b>Stored</b>	125	1	0	1	2
<b>*bric-</b>	1	1	0	0	1
<b>Cluter</b>	1	1	0	0	1
<b>Impeed</b>	1	1	0	0	1
<b>Squallid</b>	1	0	0	1	1
<b>Untidy</b>	1	0	1	0	1
<b>Filth</b>	2	0	1	0	1
<b>Hampered</b>	3	1	0	0	1
<b>Hord</b>	3	1	0	0	1
<b>Community care</b>	4	1	0	0	1
<b>Urine</b>	5	0	0	1	1
<b>Fuel load</b>	8	1	0	0	1
<b>Mental health</b>	8	0	1	0	1
<b>Dementia</b>	18	1	0	0	1
<b>Poor</b>	49	0	0	1	1
<b>Boxes</b>	50	0	0	1	1
<b>Stack</b>	60	1	0	0	1
<b>Filled with</b>	61	1	0	0	1
<b>Refer</b>	81	1	0	0	1
<b>Local council</b>	100	0	0	1	1
<b>Amount + significant OR large OR excess OR huge OR enormous</b>	145	1	0	0	1
<b>Debris</b>	259	1	0	0	1

#### Appendix B.4: Keywords by Success Rate

Keyword	Instances	Hoarding	Squalor	H&S	Total	%
<b>*bric-</b>	1	1	0	0	1	100
<b>Cluter</b>	1	1	0	0	1	100
<b>Impeed</b>	1	1	0	0	1	100
<b>Squallid</b>	1	0	0	1	1	100
<b>Untidy</b>	1	0	1	0	1	100
<b>Hoar</b>	41	31	0	4	35	85.4
<b>Julie Harris</b>	6	2	0	2	4	66.7
<b>Clutter</b>	4	1	0	1	2	50
<b>Filth</b>	2	0	1	0	1	50
<b>Junk</b>	5	2	0	0	2	40
<b>Hampered</b>	3	1	0	0	1	33.3
<b>Hord</b>	3	1	0	0	1	33.3
<b>Fire load</b>	7	2	0	0	2	28.6
<b>Community care</b>	4	1	0	0	1	25
<b>Urine</b>	5	0	0	1	1	20
<b>Fuel load</b>	8	1	0	0	1	12.5
<b>Mental health</b>	8	0	1	0	1	12.5
<b>Dementia</b>	18	1	0	0	1	5.6
<b>Access +Hard OR difficult OR poor OR "no access" OR lack</b>	92	3	0	1	4	4.3
<b>Blocked</b>	140	2	0	1	3	2.1
<b>Poor</b>	49	0	0	1	1	2.0
<b>Boxes</b>	50	0	0	1	1	2
<b>Pile</b>	235	4	0	0	4	1.7
<b>Stack</b>	60	1	0	0	1	1.7
<b>Filled with</b>	61	1	0	0	1	1.6
<b>Stored</b>	125	1	0	1	2	1.6
<b>Rubbish - "rubbish truck" - "chute" - "rubbish bin" - "small rubbish fire" - "bin of rubbish" - "small amount of rubbish" - "bins of rubbish"</b>	587	6	0	2	8	1.4
<b>Refer</b>	81	1	0	0	1	1.2
<b>Local council</b>	100	0	0	1	1	1
<b>Amount + significant OR large OR excess OR huge OR enormous</b>	145	1	0	0	1	0.7
<b>Debris</b>	259	1	0	0	1	0.4
<b>*aces*</b>	0	0	0	0	0	0
<b>*bric*-</b>	0	0	0	0	0	0

Keyword	Instances	Hoarding	Squalor	H&S	Total	%
*bric*a	0	0	0	0	0	0
*brica	0	0	0	0	0	0
*brick-	1	0	0	0	0	0
*brick*-	0	0	0	0	0	0
*brick*-	0	0	0	0	0	0
*brick*a*	0	0	0	0	0	0
*bricka	0	0	0	0	0	0
*brik*	0	0	0	0	0	0
Abnormal	10	0	0	0	0	0
Abundance	0	0	0	0	0	0
Accumulat	13	0	0	0	0	0
Acess	10	0	0	0	0	0
Acrid	2	0	0	0	0	0
Ad hoc	0	0	0	0	0	0
Anormal	0	0	0	0	0	0
Bad electrical wiring	0	0	0	0	0	0
Blocking	3	0	0	0	0	0
Breach of	3	0	0	0	0	0
Cans	44	0	0	0	0	0
Chattel	0	0	0	0	0	0
Closed off	15	0	0		0	0
Clutter Image Rating Scale	0	0	0	0	0	0
Collection	40	0	0	0	0	0
Comunity care	0	0	0	0	0	0
Cotents	0	0	0	0	0	0
Decay	1	0	0	0	0	0
Decompos	6	0	0	0	0	0
Defication	0	0	0	0	0	0
Deny help	0	0	0	0	0	0
Depravity	0	0	0	0	0	0
Dingy	0	0	0	0	0	0
Dirt	42	0	0	0	0	0
Discarded	0	0	0	0	0	0
Disgusting	0	0	0	0	0	0
Egress +Hard OR +difficult OR + poor	1	0	0	0	0	0
Encroach	1	0	0	0	0	0
Excess	87	0	0	0	0	0
Faeces	3	0	0	0	0	0
Feces	0	0	0	0	0	0
Food scrap	3	0	0	0	0	0
Foul	1	0	0	0	0	0
Full of items	0	0	0	0	0	0

<b>Keyword</b>	<b>Instances</b>	<b>Hoarding</b>	<b>Squalor</b>	<b>H&amp;S</b>	<b>Total</b>	<b>%</b>
<b>Garbage</b>	58	0	0	0	0	0
<b>Goods</b>	24	0	0	0	0	0
<b>Grime</b>	1	0	0	0	0	0
<b>Haord</b>	0	0	0	0	0	0
<b>Heavily loaded</b>	0	0	0	0	0	0
<b>High level of</b>	3	0	0	0	0	0
<b>Hored</b>	7	0	0	0	0	0
<b>Hovel</b>	0	0	0	0	0	0
<b>Hygene</b>	0	0	0	0	0	0
<b>Hygiene</b>	0	0	0	0	0	0
<b>Impede</b>	2	0	0	0	0	0
<b>Insects</b>	0	0	0	0	0	0
<b>Jnk</b>	0	0	0	0	0	0
<b>Lack of maintenance</b>	12	0	0	0	0	0
<b>Limited</b>	28	0	0	0	0	0
<b>Lined</b>	58	0	0	0	0	0
<b>Many animals</b>	0	0	0	0	0	0
<b>Memorabilia</b>	0	0	0	0	0	0
<b>Messy</b>	0	0	0	0	0	0
<b>Mice</b>	4	0	0	0	0	0
<b>Mold</b>	1	0	0	0	0	0
<b>Mould</b>	2	0	0	0	0	0
<b>Muck</b>	0	0	0	0	0	0
<b>Multitude</b>	1	0	0	0	0	0
<b>Narrow</b>	11	0	0	0	0	0
<b>Neglect</b>	3	0	0	0	0	0
<b>Notification pack</b>	0	0	0	0	0	0
<b>Organic matter</b>	0	0	0	0	0	0
<b>Pungent</b>	8	0	0	0	0	0
<b>Putrid</b>	0	0	0	0	0	0
<b>Rat Infested</b>	0	0	0	0	0	0
<b>Rat-infested</b>	0	0	0	0	0	0
<b>Rats</b>	1	0	0	0	0	0
<b>Refuse</b>	0	0	0	0	0	0
<b>Resistance</b>	1	0	0	0	0	0
<b>Rotten</b>	5	0	0	0	0	0
<b>Rotting</b>	2	0	0	0	0	0
<b>Rubish</b>	37	0	0	0	0	0
<b>Ruvbbish</b>	1	0	0	0	0	0
<b>Shabby</b>	1	0	0	0	0	0
<b>Sickening</b>	0	0	0	0	0	0
<b>Small Path</b>	0	0	0	0	0	0
<b>Smelly</b>	0	0	0	0	0	0

<b>Keyword</b>	<b>Instances</b>	<b>Hoarding</b>	<b>Squalor</b>	<b>H&amp;S</b>	<b>Total</b>	<b>%</b>
<b>Smelt</b>	64	0	0	0	0	0
<b>Soiled</b>	2	0	0	0	0	0
<b>Spoiled food</b>	0	0	0	0	0	0
<b>Spoilt</b>	0	0	0	0	0	0
<b>Sqalor</b>	0	0	0	0	0	0
<b>Squalid</b>	0	0	0	0	0	0
<b>Squalor</b>	0	0	0	0	0	0
<b>Squalour</b>	0	0	0	0	0	0
<b>Stink</b>	2	0	0	0	0	0
<b>Stock</b>	23	0	0	0	0	0
<b>Storage items</b>	0	0	0	0	0	0
<b>Storred</b>	0	0	0	0	0	0
<b>Strewn</b>	4	0	0	0	0	0
<b>Unable to organise</b>	0	0	0	0	0	0
<b>Unable to organize</b>	0	0	0	0	0	0
<b>Unclean</b>	1	0	0	0	0	0
<b>Unhygienic</b>	0	0	0	0	0	0
<b>Unkept</b>	0	0	0	0	0	0
<b>Unorthodox</b>	0	0	0	0	0	0
<b>Unsanitary</b>	0	0	0	0	0	0
<b>Vermin</b>	2	0	0	0	0	0
<b>Volume of items</b>	0	0	0	0	0	0
<b>Volume of materials</b>	0	0	0	0	0	0
<b>Wreched</b>	0	0	0	0	0	0

## Appendix B.5: Excluded Keywords

<b>Term</b>	<b>Category</b>	<b>Reason for elimination</b>
<b>Access</b>	Access Issues	The term "access" was not used on its own, but instead was filtered to show only results which included the word "access" as well as "difficult" or "hard". Other words, such as "poor" were searched for in their entirety and therefore were not used to refine "access".
<b>Accumulated</b>	Storage of Materials	"Accumulat" was searched for in order to produce results which included "accumulate", "accumulated", "accumulating", and "accumulation".
<b>Accumulation</b>	Quantity	See "accumulated".
<b>Acumulated</b>	Storage of Materials	Misspelling of "accumulated" deemed irrelevant.
<b>Amount</b>	Quantity	Too many instances of "amount" in unrelated uses. Refined to "amount" and "significant", "large", "excess", "huge", or "enormous".
<b>Amount of goods</b>	Quantity	"Amount of goods" would be produced during search for "amount".
<b>Blocked egress</b>	Access Issues	"Blocked egress" would be produced during search for "egress".
<b>Blocked entry</b>	Access Issues	"Blocked entry" would be produced during search for "blocked".
<b>Blocked exits</b>	Access Issues	Included from search for "blocked".
<b>Boarding</b>	Variations of Hoarding	Misspelling of "hoarding". Brought up large volume of irrelevant results.
<b>Breach</b>	Mental Health and Community Services	"Breach" was refined to "breach of".
<b>Breach of code</b>	Mental Health and Community Services	"Breach of code" would be produced during search for "breach of".
<b>Breach of residential regulations</b>	Mental Health and Community Services	"Breach of residential regulations" would be produced during search for "breach of".
<b>Bric a brac</b>	Variations of Brick A Brack	See methodology for explanation of how variations of "bric a brac" was searched for.
<b>Brick a brack</b>	Variations of Brick A Brack	See methodology for explanation of how variations of "bric a brac" was searched for.
<b>Chattels</b>	Mental Health and Community Services	Used "chattel" to be inclusive of both "chattel" and "chattels".
<b>Community</b>	Mental Health and Community Services	Too many instances of "community"; refined to "community care".
<b>Difficulty</b>	Access Issues	"Difficult" was used to refine the search of "access". Was not found to be necessary as a standalone search term.



<b>Term</b>	<b>Category</b>	<b>Reason for elimination</b>
<b>Disconect</b>	Household Neglect and Waste - Dry	Misspelling of "disconnected". See "disconnected".
<b>Disconnected</b>	Household Neglect and Waste - Dry	"Disconnected" produced irrelevant results.
<b>Disconnected services</b>	Household Neglect and Waste - Dry	"Disconnected" would have produced "disconnected services". See "disconnected".
<b>Filled</b>	Storage of Materials	Refined "filled" to be "filled with".
<b>Forced entry</b>	Access Issues	"Forced entry" produced irrelevant results.
<b>Hoarded</b>	Variations of Hoarding	"Hoar" was used to capture variations of "hoard" such as "hoarded".
<b>Hoarder</b>	Variations of Hoarding	"Hoar" was used to capture variations of "hoard" such as "hoarder".
<b>Hoarding</b>	Variations of Hoarding	"Hoar" was used to capture variations of "hoard" such as "hoarding".
<b>Horder</b>	Variations of Hoarding	Would be produced during search for "hord".
<b>Hording</b>	Variations of Hoarding	Would be produced during search for "hord".
<b>Horeder</b>	Variations of Hoarding	Misspelling producing no results.
<b>Materials</b>	Mental Health and Community Services	"Materials" produced too many results. Confined search to specific types of materials.
<b>Narrow hallways</b>	Access Issues	"Narrow hallways" would be captured by our search for "narrow".
<b>Narrow pathways</b>	Access Issues	"Narrow pathways" would be captured by our search for "narrow".
<b>Narrow walkways</b>	Access Issues	"Narrow walkways" would be captured by our search for "narrow".
<b>Newspaper</b>	Mental Health and Community Services	"Newspaper" produced too many irrelevant results. Assumed the same results would show up from words describing how the newspapers were stored such as "stack", "pile" and "lined".
<b>Refuse services</b>	Mental Health and Community Services	Used "refused"
<b>Numerous</b>	Quantity	"Numerous" was produced many results which were not relevant to this study.
<b>Piled</b>	Storage of Materials	"Piled" would be captured by our search for "pile".
<b>Piles</b>	Storage of Materials	"Piles" would be captured by our search for "pile".
<b>Piles of junk</b>	Storage of Materials	"Piles of junk" would be captured by our search for "pile".
<b>Piles of rubbish</b>	Storage of Materials	"Piles of rubbish" would be captured by our search for "pile".
<b>Pilles</b>	Storage of Materials	Misspelling of "piles" deemed to be irrelevant.
<b>Poor hygiene</b>	Hygiene	"Poor hygiene" would be captured by our searches for "poor" and "hygiene" individually.