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Understanding Ethnicity and Residential Fires from the Perspective of Cultural Values and Practices: A Case Study of Leicester, United Kingdom

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Highlights

The paper presents a comprehensive analysis of the distribution of residential fires in an ethnically diverse urban area.

Residential dwelling fires are not properly understood in terms of ethnicity as well as cultural norms and practices.

An analysis of national census data and a community survey addresses residential fires in terms of cultural values.

Variables such as trust and personal relationships explain the variance in rates of residential fires in ethnic communities.

Abstract

The Grenfell Tower and Lakanal House fires in London in 2017 and 2009 highlighted how these devastating events mainly affected people from ethnic minorities. While many studies have explored the role of socio-demographic variables in residential fires, ethnicity has received only marginal attention. To redress this imbalance, this paper specifically addresses rate and severity of residential fires in relation to ethnicity. To that end, the study conceptualises ethnicity in a novel way—not as an individual variable but from a community perspective, focusing on cultural norms and practices and how these relate to residential fire incidents. As well as data from the Leicestershire Fire and Rescue Service and National Census, the study draws on data collected in a survey of community structure and risk behaviour in Leicestershire. The findings reveal that trust and personal relationships are fundamental to information sharing within this community. This highly personal form of knowledge acquisition is not matched by the fire service's more anonymous information-driven approach. The findings highlight the need for a more person-centred approach to fire safety to ensure that interventions in more vulnerable neighbourhoods and communities can contribute more effectively to fire safety and reductions in the rate and severity of fires.

Keywords

Regression analysis, community survey, ethnicity, cultural risks, fire prevention, trust

1. Introduction

On 14 June 2017, a fire broke out in the 24-storey Grenfell Tower block in London, leading to 72 deaths and more than 70 injuries [1]. While media coverage and subsequent reports focused on the cladding, the stay-put policy and fire service training and preparation, it was also noted that a majority of the victims came from ethnic minority backgrounds and a diverse range of countries that included Afghanistan, Colombia, Egypt, Eritrea, Lebanon and Sudan. Similarly, the deadly Lakanal House fire in Southwark, London, in 2009 also mainly affected people from ethnic minorities, and a growing body of evidence suggests that ethnic minorities are disproportionately affected by such fire hazards [2,3]. In the United Kingdom, no data is collected on fire incidents and ethnicity, but only on fire fatalities. However, numbers of fire fatalities are too small from a statistical perspective as to substantiate correlations between the two. Likewise, in the United States only information on fire fatalities and ethnicity is available, but due to the higher number of fire fatalities a recent study commissioned by the National Fire Protection Association (NFPA) could demonstrate that higher fire fatality rates are correlated with larger percentages of people who African American or Black American, or are Native American or Alaskan Native [4]. Due to the lack of comprehensive data fire services in the United Kingdom have relied on alternative sources, for instance, housing surveys. One of the variations that was noticed by some initiatives are differences in the usage of smoke alarms. A number of public information campaigns have sought to address this issue. For instance, in the UK in 2005 and 2006, the Deputy Prime Minister's Office ran a fire-safety awareness campaign that was promoted during the Diwali (Hindu), Eid (Muslim) and Chinese New Year festivals. In 2008, the Fire Kills campaign referred to the 2004–2005 Survey of English Housing, which showed that smoke alarm ownership among Asian households was 10% lower than the national average. As part of the Fire Kills campaign, the advertising agency Media Moguls produced ads for newspapers and television channels that have certain ethnic group as their main audience in an effort to increase the number of smoke alarms in selected communities [5]. Other initiatives have adopted a more practical approach by distributing smoke alarms free of charge, and following the distribution of free educational brochures, more than 20,000 smoke alarms were installed in a number of multi-ethnic boroughs in early 2000. Although evaluation studies indicate that such initiatives generally have little or no impact [6,7], there has been no systematic research on fire behaviour in these boroughs—why, for instance, there are fewer fire alarms—but it is assumed that ethnicity plays a role [8,9].¹

Consequently, the overarching aim of this paper is to develop a better understanding of how cultural values and practices as well as ethnic factors might contribute to residential fires and, in particular, to analyse how ethnicity needs to be conceptualised, so that it can explain the frequency and severity of residential fires. This seems especially relevant in a British context,

¹ An effective example of such a campaign is presented by Clare et al. [10], who reports on fire safety campaign in Surrey, British Columbia, where the local fire service would not simply distribute smoke alarms and leaflets, but where fire safety advice was integrated into a broader engagement programme that targeted specific areas. This shows that community engagement and thereby building a mutual relationship is of great importance to make such campaigns a success.

as an estimated 14% of the population in 2019 (about 9.3 million people) were born outside the UK as compared to a figure of 5.2 million in 2004. The Black Lives Matter movement and the impact of Covid-19 on BAME communities has increased research interest in the greater vulnerability of ethnic groups, and fire services have recognised the need to improve the diversity of their staff as well as servicing different communities and their needs, as reflected in the Fire and Rescue Service Equality and Diversity Strategy 2008–2018 [11].

2. Previous research and theoretical foundations

A significant body of existing research has emphasised the importance of socio-economic factors in residential fires [12,13,14,15,16,17], identifying poverty [18], poor housing quality [19,2] and lower educational attainment [7] as important determining variables. Other studies have highlighted the role of household structure or family composition, as in the case of single parents or adults living alone. In recent years, spatial and statistical methods have provided a broader understanding of the links between fire incidents and socio-economic factors, and this more holistic approach can identify both individuals and communities at risk [3,20]. However, most explanations still consider ethnicity in terms of collinearity with poverty and deprivation [21], there are varying understandings of the role of ethnicity as a significant predictor of likelihood of residential fire [14,3,22]. Nevertheless, a number of recent evidence have tried to overcome these limitation using more sophisticated conceptual or methodological approaches; for instance, Hastie and Searle [20] demonstrated that despite a substantial reduction of fire incidents in the UK in recent years considerable inequalities in the way fires are distributed through society continue to exist especially in an ethnically diverse area like the West Midlands, residents identifying as Black (Caribbean, African and Other) were significantly more affected by fire incidents. The authors also criticise that conceptualising socio-economic factors in the form of correlations between individual variables make it difficult to discern the specific impact on the distribution of fires, thus, leading to the abovementioned dangers to consider ethnicity in terms of collinearity with other factors. A recent study by Dean et al. [23] proposes to develop this further, in which ethnicity is not simply regarded as an individual variable for statistical aggregation but is seen in terms of how the broader social and cultural community context may contribute to different risk behaviours and perceptions. On this view, ethnicity must be seen in the context of alignment with cultural and community norms and practices. While this is a welcome shift of emphasis, the study was limited by the fact that UK demographic data in this context relate only to reported fire injuries, and the dataset for certain ethnic groups was very small; for instance, only 9 Chinese people featured in the dataset, and only about 400 were from ethnic minorities in Manchester, which has a BAME population of almost 500,000. More importantly, perhaps, Dean et al. [23] made at best only a superficial link between fire injuries and cultural norms and practices.

The present study makes a deliberate effort to conceptualise ethnicity in terms of cultural norms and practices rather than as a direct predictor of risk. Approaches that keep culture and risk in such a direct relation typically refer to the questions how different cultures conceptualise, understand and rank risks differently. However, within the context of this

research it is the responses to risk and actual fire incidents as determined by cultural values and practices is emphasised and how it is therefore advantageous to bring a cultural (rather than mere demographical) understanding to ethnicity. This is important because particular cultural practices in neighbourhoods with a strong community structure may lead to greater risk than ethnicity itself. In short, we contend that cultural practices and norms need to be understood rather than reduced to a demographic label.

This line of thought is supported by research on cultural risk behaviour [23,24]; the cultural theory of risk asserts that social norms and structures shape how people respond to risks and behaviours managing risks through integration in personal networks and institutional contexts [25]. Unlike cognitive or behavioural theories of risks, this approach does not reduce the existence of risk to cultural relativism but rather holds that culture is a set of values and practices that enables people to respond and deal with risks in certain ways. Rather than reducing risk and safety to cognitive or educational understandings, cultural theory regards these issues as inseparable from values and norms. The theory holds that risk behaviour and the importance and management of risks for the individual is shaped by their social groups and personal networks, including their local community, peer group or household, and by the extent to which they feel tied to societal norms and values [26].

These two dimensions—group/personal networks and societal norms—form expectations and value systems and create different types of cultural practices through which one responds to risks. For instance, weak social integration and reliance on broader social norms informs a more individualistic view of risk, and there is ample empirical evidence of these differences in risk culture [27,28]. In focusing on ethnicity, the present study devotes particular attention to risk cultures in social environments characterised by strong group boundaries and binding prescriptions that value the collective over the individual, where group norms and values justify and inform people's way of life. Equality and common beliefs feature strongly in creating shared trust as well as shared fears. This typically implies an emphasis on responding to external risks, so reinforcing bonds among the group's members while people from outside the group who do not share its norms are likely to be viewed with greater suspicion and are less trusted.

In adopting this more contextualised perspective on ethnicity, the present study proposes novel ways in which fire services can understand vulnerability and build better levels of community engagement to prevent or reduce residential fires. As an ethnically diverse city, Leicester was considered an appropriate research setting, and the findings can reasonably be expected to transfer to other multicultural UK cities like Birmingham, Edinburgh, London and Manchester.

2.1. Leicestershire and the City of Leicester

The Leicestershire Fire and Rescue Service (LFRS) serves a broad area of the East Midlands, including urban areas like Loughborough and Leicester as well as more rural districts like Rutland. Covering an area of more than 979 square miles, the LFRS has 20 fire stations and

employs just over 700 staff, of whom about 560 are firefighters. The LFRS attends about 8,000 emergency incidents every year. The county's current population of about 1.1 million is diverse and continues to grow. According to recent data, 51% of the present population consider themselves White British, White Irish and White Other; 37% identify as Asian/Asian British; 6% identify as Black/African/Caribbean/Black British, 4% as mixed/multiple ethnicity and 3% as Other [29]. Large numbers of non-UK-born residents come from South-East Asian regions (like India and Pakistan), from South and Eastern Africa (primarily Uganda, Kenya, Zimbabwe and Somalia) and from Eastern Europe (principally Poland).

3. Methods

3.1. Overview

The study examined the frequency and severity² of residential fires across an area served by the Leicestershire Fire and Rescue Service (LFRS), collecting data in two phases. In phase 1, the LFRS provided anonymised data on fire incidents attended between January 2010 and December 2014.³ These data were analysed with reference to a range of socio-economic and demographic data from the UK census of 2011. SPSS was used to explore correlations between frequency and severity of fire incidents and each of the potential predictor variables (see Table 1). Individual linear regression plots for a number of independent variables revealed collinearity between frequency of fires and Black African/Black Caribbean/Black British groups. This finding was further explored using a stepwise regression involving all of the socio-demographic variables, which provided further confirmation of this correlation with greater severity of fire incidents. However, the stepwise regression also revealed a negative correlation between fire frequency and fire severity in multi-ethnic households, including multi-ethnic Black African/Black Caribbean/Black British households.⁴ This somewhat contradictory finding (discussed in more detail later) confirmed the need to unpack the notion of ethnicity and to adopt a broader community perspective that takes account of cultural norms and practices. To that end, phase 2 involved a quantitative survey of Leicester's Black African/Black Caribbean/Black British community. The 350 completed questionnaires represent about 2% of this population in Leicester, so providing a solid database that was in effect a mini-census.⁵ The survey combined quantitative measures of the kind used in

² Frequency is here defined as the rate of fire incidents that were attended by the fire and rescue service. The severity was defined by six different levels (low = 0 to high = 5), such as: 0 = No heat or flame damage (only smoke), 1 = Limited to item 1st ignited, 2 = Limited to room of origin, 3 = Limited to floor of origin (not whole building) / Roof space only, 4 = Affecting more than 2 floors (not whole building) / Limited to 2 floors (not whole building) / Roof space and other floors(s) 5 = Whole building / Whole roof (including roof space).

³ Data included month and year of the fire incident, severity rating, full postcode, ward name, ignition source, main cause.

⁴ A detailed analysis that includes a report on individual variable results, regression diagnostics and other variables will be reported in another publication.

⁵ The survey was announced on the LFRS website as well as social media, promoted via BBC Leicester Radio and flyers. To gather the data the researcher team used a cluster random sample of Leicester's Black British, Black Caribbean, Black African and Black Other population. This population was divided into sub-groups according to their geographical vicinity in order to ensure that the sample is as diverse as the population, but likewise sensible enough to recognise local differences. A random sample of community organisations was

community needs surveys with more behavioural measures to reveal the structure of community relationships and shared and cherished values and how these relate to risk behaviour.⁶ The data were collected during 2018/2019, and SPSS analysis of various descriptive variables and correlations helped to build a clearer picture of the community, including key variables like trust and personal communication.

3.2. Choice of geographical unit

Phase 1 of the research devoted particular attention to the appropriate size of unit for an area-based study and how this could be matched to the dataset. In line with data protection provisions, the dataset provided by the LFRS was in anonymised form—in other words, names and addresses were not included. To identify any potential correlation between variables related to certain fire incidents, it was important to select a unit of analysis that could serve as a proxy; the larger the area, the more likely it is that heterogeneous populations will camouflage internal differences. For the purposes of this research, the postcode system was selected as the primary unit of analysis. In the UK, a postcode usually comprises 5 to 7 letters and numbers that denote areas at various levels. The first two letters typically designate a broad area—for example, LE designates the whole of Leicestershire including, Rutland. Each further addition subdivides areas into more specific districts. The postcode in its entirety (so-called *level 4*) is the most detailed and final designation of a specific group of houses or addresses.

While this approach does not match fire incidents to specific households, it facilitates relatively fine-grained analysis, as postcodes typically cover small geographical units.⁷ Based on this near one-to-one relation, it was possible to re-aggregate the data using information on residential segregation in Leicester [30], showing that Leicester exhibits a very high degree of dissimilarity at 51.3 (only Blackburn exhibits higher dissimilarity).⁸ This important methodological choice enables aggregation of variables according to neighbourhood or district dissimilarity structures. As a consequence, ethnicity can be observed not simply as an individual variable but in terms of social embedding within a community; see also [31,32].

This approach overcomes some of the limitations of previous studies that employed Lower Layer Super Output Area (LSOA) as the unit of analysis [20,9]. As defined by the Office for National Statistics, LSOA is used to conduct a census with the aim of achieving an even

drawn from these clusters and all their members received a paper questionnaire. The response rate was at about 80 per cent.

⁶ Ethical approval was obtained prior to data collection. The questionnaire was pre-tested in December 2018 (N = 34), and a few questions were subsequently fine-tuned. The questionnaire was divided into three broad areas. The first one consisted of demographic questions, the second one covered the structure of the community, values and cultural practices and the third section focused on more behavioural questions and understanding of fire safety.

⁷ Data provided by the Leicestershire Fire and Rescue Service was down to all digits of the British postcode.

⁸ This value indicates what proportion of different ethnic groups would need to change to produce an even distribution [29]. The lowest possible value is zero, which would represent a statistically perfect distribution. The mean across all English local authorities is 33.4.

distribution across a certain area. For that reason, LSOA units range in population between 1,000–3,000, and these larger units make it impossible to identify the distribution of ethnicity in terms of social embedding.

3.3. Choice of predictor variables

While aiming to enhance existing understanding of the relation between ethnicity and fire incidents, the analysis in phase 1 extended beyond this criterion and initially addressed a much broader set of predictor variables to detect any potential interference or clustering. Jennings’ review [15] of those variables is largely informed by a set of factors that are typically associated with fires, including demographic variables like poverty and social deprivation, poor housing quality, lack of employment opportunities and lower educational attainment. The present research encompassed a range of other factors that capture more of a given area’s cultural dynamic; in addition to common ethnic classifications, the study looked at value orientations in terms of religious worship, country of birth, languages spoken in the household and ethnic composition of the household (see Table 1).

Table 1. Census variables 2011. Source: Office for National Statistics [33]

Proficiency in English (English main language to cannot speak English)
Industry (agriculture to arts and entertainment; 18 industry sectors)
Occupation (senior manager to elementary occupation)
Household Multiple Ethnic Groups (same ethnic group to combination of multiple ethnic groups)
Religion (Christian, Muslim, Jewish etc. or no religion)
Age (different age cohorts (usually of four years; e.g. 5 to 9)
Main Language (English, various European languages, Arabic, languages spoken in different regions of Asia and Africa)
Ethnicity ⁹
Economic activity (active/inactive)
Country of birth
Level of qualification (from no qualification to Level 4 or above)

3.4. Regression (linear and stepwise)

To explore the relationship between fire frequency, severity and the predictor variables in Table 1, a number of regressions were calculated and tested for significance, including linear and multiple regressions of fire frequency and severity with individual variables. This first stage sought to identify any important and unique differences between different variables and to understand their spatial distribution as an indicator of differences between areas. As the study addresses multiple potential explanatory variables in the absence of a proven

⁹ White, Mixed/multiple ethnic groups, Asian/Asian British, Asian/Asian British: Indian, Asian/Asian British: Pakistani, Asian/Asian British: Bangladeshi, Asian/Asian British: Chinese, Asian/Asian British: Other Asian, Black African/Black Caribbean/Black British, Black African/Black Caribbean/Black British: Africa, Black African/Black Caribbean/Black British: Caribbean, Black African/Black Caribbean/Black British: Other Black, Other ethnic group, Other ethnic group: Arab, Other ethnic group: Any other ethnic group.

underlying theory, a step-wise regression analysis was also conducted, selecting variables that indicated collinearity in the previous round. That pre-selection was an important safeguard against overfitting of variables by adding (or deleting) variables as appropriate. As step-wise regression analysis helps to fine-tune the model and to choose the best predictor variables from the available options, it was considered suitable for present purposes. This fine-tuning of results involved multiple iterations using forward and backward selection and composite variables, including combined ethnic groups such as Black British, Black Caribbean, Black African and Black Other. To avoid overfitting, smaller geographical regions related to country of birth (composite variables) were excluded in later iterations—for instance, by removing people born in Oceania.

4. Results and discussion

4.1. Ethnic minorities, fire frequency and fire severity (phase 1)

Having constructed a linear model using regression analysis and ANOVA, analysis of a range of variables identified statistically significant correlations (at 0.01) that have been well discussed in the existing literature, including economic inactivity and overall urban density. In the present context, one predictor variable in particular showed a positive correlation (at 0.01) with fire frequency, and its fit to the data was tested using goodness-of-fit analysis and an R-squared (R^2) statistic.

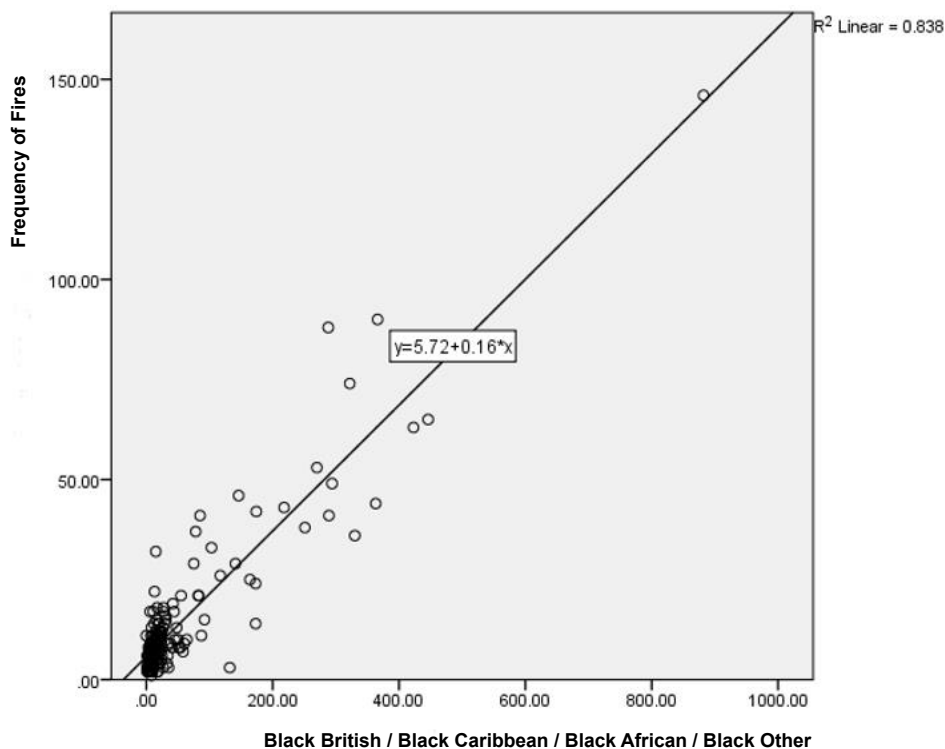


Fig. 1. Frequency of fire by people with Black ethnicity. Source: LFRS and National Census 2011

R-squared is a statistical measure that explains how closely the data fit the regression line. The more data (dots) that can be fitted, the better this explains the variation; in other words, R-squared is the percentage of response variable variation that can be explained by a linear regression, ranging from 0% (explaining none of the variation) to 100% (explaining all). These results show that the variable *Black British/Black Caribbean/Black African/Black Other* explains almost 84% of the variation in *frequency of fire*, which can be considered a very robust explanation. The results in Figure 1 align with other testing parameters—for instance, the above average positive correlation (0.466) between *Black British/Black Caribbean/Black African/Black Other* and *severity of fire*.

Table 2. Black British/Black Caribbean/Black African/Black Other by severity of fire. Source: LFRS and National Census 2011.

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
Black British/Black Caribbean/Black African/Black Other	0.466	0.137	0.915	3.411	0.001

As mentioned earlier, current explanations still consider ethnicity in terms of collinearity with poverty and deprivation. However, the stepwise regression that would add or remove categories like economic inactivity altered the model, and correlations were quite weak: between 0.015 (*Black British/Black Caribbean/Black African/Black Other* and *economically inactive*) to a max of 0.04 (if the first two are combined with *age above 60*). As such, the present findings do not support this account. However, the analysis did confirm that one other category made a difference in explaining these variations: *ethnic composition of the household*. This shows the ethnicity variable in relation to others who might or might not share the same background, providing a better understanding of the social embedding of ethnicity.

Table 3. Black British/Black Caribbean/Black African/Black Other: Different household ethnic groups by frequency of fire. Source: LFRS and National Census 2011

	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	B	Std. Error	Beta		
Different ethnic groups within household	-0.199	0.013	-0.459	-7.589	0.001

At first sight, this finding may seem paradoxical; how can household ethnic diversity have a mitigating effect (modest negative correlation) on fire rate? To interpret this finding, we must return to the more holistic conceptualisation of ethnicity discussed earlier. The theory of cultural risk emphasises that the values and practices that underpin how people respond to risks are shaped by community structure, as are social learning and its boundaries. The theory

also suggests that, in social settings governed by strong group norms, social learning is confined to members of the same group, who are seen as trustworthy and share a common understanding. However, this has consequences for the ability to disseminate information and, more importantly, the ability to acquire new information. According to network theory, learning new information requires connections outside one's own bubble. For instance, Mark Granovetter's well-known study *Getting a Job* [34] reported that 17% of his respondents reported learning about new jobs from a close friend; 28% reported learning about new jobs from someone they barely knew; and a whopping 56% reported learning about new jobs from an acquaintance. Granovetter explained this seemingly paradoxical finding in terms of informational differences in networks. Personal networks (of close friends and family) may be very committed to helping, but they are likely to possess more or less the same knowledge, and one probably already knows most of their contacts. However, acquaintances (people we 'sort of know') are of greater value because they provide access to quite different networks and therefore to more opportunities. In other words, the common idea that 'two heads are better than one' really only makes a difference if knowledge is sufficiently diverse; where both people share more or less the same background, they will bring fewer opportunities to the table.

In the present context, this suggests that ethnicity as an individual variable is not what matters; instead, the proximity of members of the same group may have an impact on fire incidents. Learning about fire safety is likely to be more restricted if it occurs within a relatively homogenous social grouping with potentially very different living standards. The present findings suggest that understanding the greater frequency and severity of fires in the context of ethnicity depends on understanding the structure of these communities and the potential communication barriers that hinder learning about fire risks and safety. By overcoming these barriers to communication and learning, fire services could expect to engage more effectively with local communities in attempting to keep them safe.

4.2. Quantitative survey of Leicester's Black population (phase 2)

A key element of the community survey was to explore key values and practices and how these are linked to fire risk and safety, as well as identifying barriers to communication between the fire service and the local community. Quantitative data facilitated a more explorative approach, combining descriptive statistics with regression analysis.

4.2.1. Community structure

The first part of the analysis sought to develop a better understanding of the structure of Leicester's Black community by identifying important values and lines of communication. The first pie charts below refine the narrative of the community as sharing a similar ethnicity and therefore a similar worldview and values.

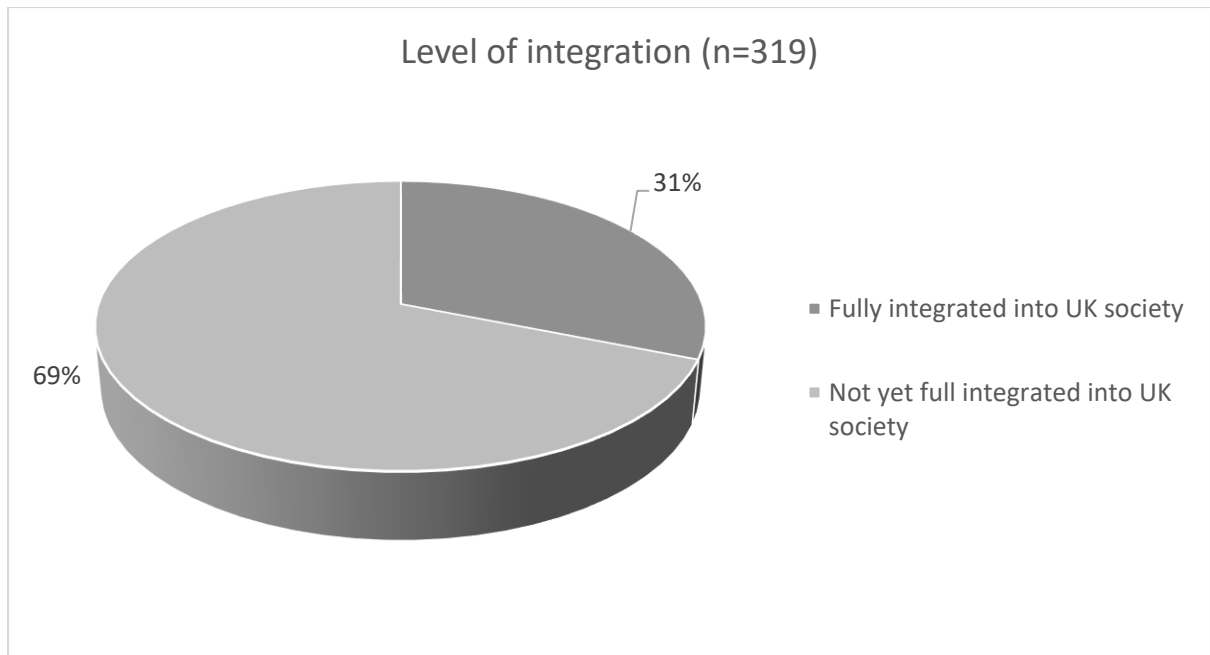


Fig. 2. Level of integration. Source: Community Survey (LFRS and Author)

When asked about their level of integration, about a third of the survey respondents said they felt fully integrated into UK society; the remaining two-thirds said they did not yet feel that integrated. On that basis, this latter group might be expected to have fewer links to people outside their community, and this view was reinforced when looking at social relationships within the community.

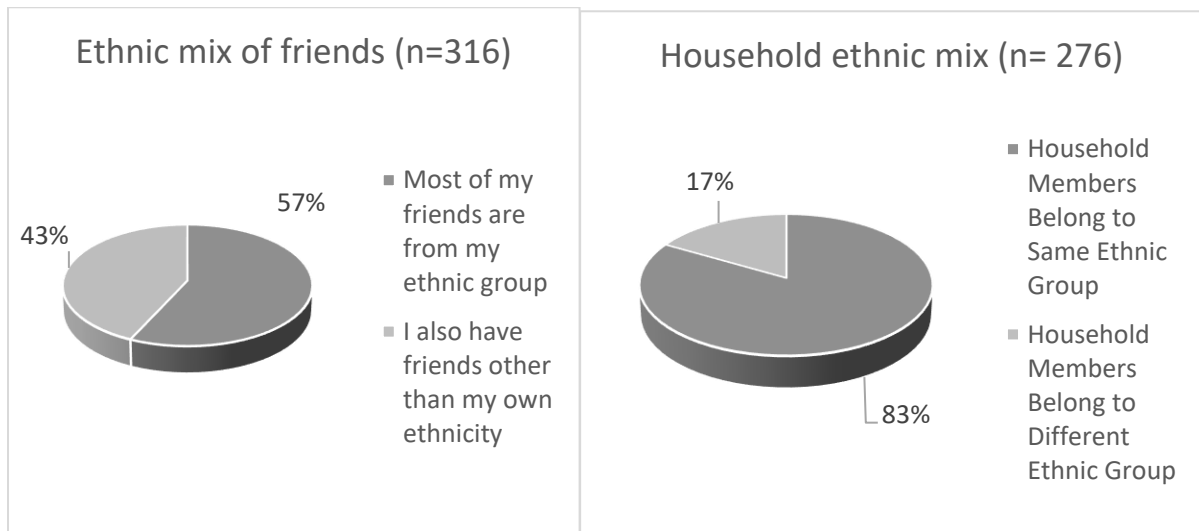


Fig. 3. Ethnic mix of social relationships. Source: Community Survey (LFRS and Author)

When asked about the diversity of their social relationships, it was noticeable that a majority of respondents (more than 50%) said that their friends were mostly from the same ethnic group. In relation to household ethnic mix, more than 80% said that they shared with a member of the same ethnic group. These descriptive data tend to confirm the assumption that

proximity to members of the same ethnic group is an important factor in the present context. When asked why people tend to mix more with members of the same ethnic group, typical answers included the following.

Table 4. Reasons for ethnic social relationships. Source: Community Survey (LFRS and Author)

just feel more comfortable with people with same background
common interests, cultural understanding, local
easy to understand, communicate and interact with, similarity
because of the proximity and culture preferences I share with them
easier to communicate and understand people of similar background
mostly have the same things in common

These results reinforce the view that ethnicity must be seen in terms of social embedding. Ethnicity is influential because it facilitates relations with others who are seen to share similar values, which aligns with other research on network homophily [35,36]. For present purposes, it was important to look beyond this broad characterisation of community to understand how this structure impacts the organisation of social relationships and communication networks within the community. This was important because current research tends to classify such ethnic clusters as ‘hard to reach’ communities, based on an underlying assumption that a particular set of values might lead to exclusion or withdrawal and some degree of isolation from the broader social reality [37,38]. A number of the survey questions explored issues around exclusion and withdrawal, including interactions with neighbours, knowledge about the neighbourhood and the fabric of social relations. The survey also sought to capture the values that shape life in the community as the mechanism that maintains these active relationships.

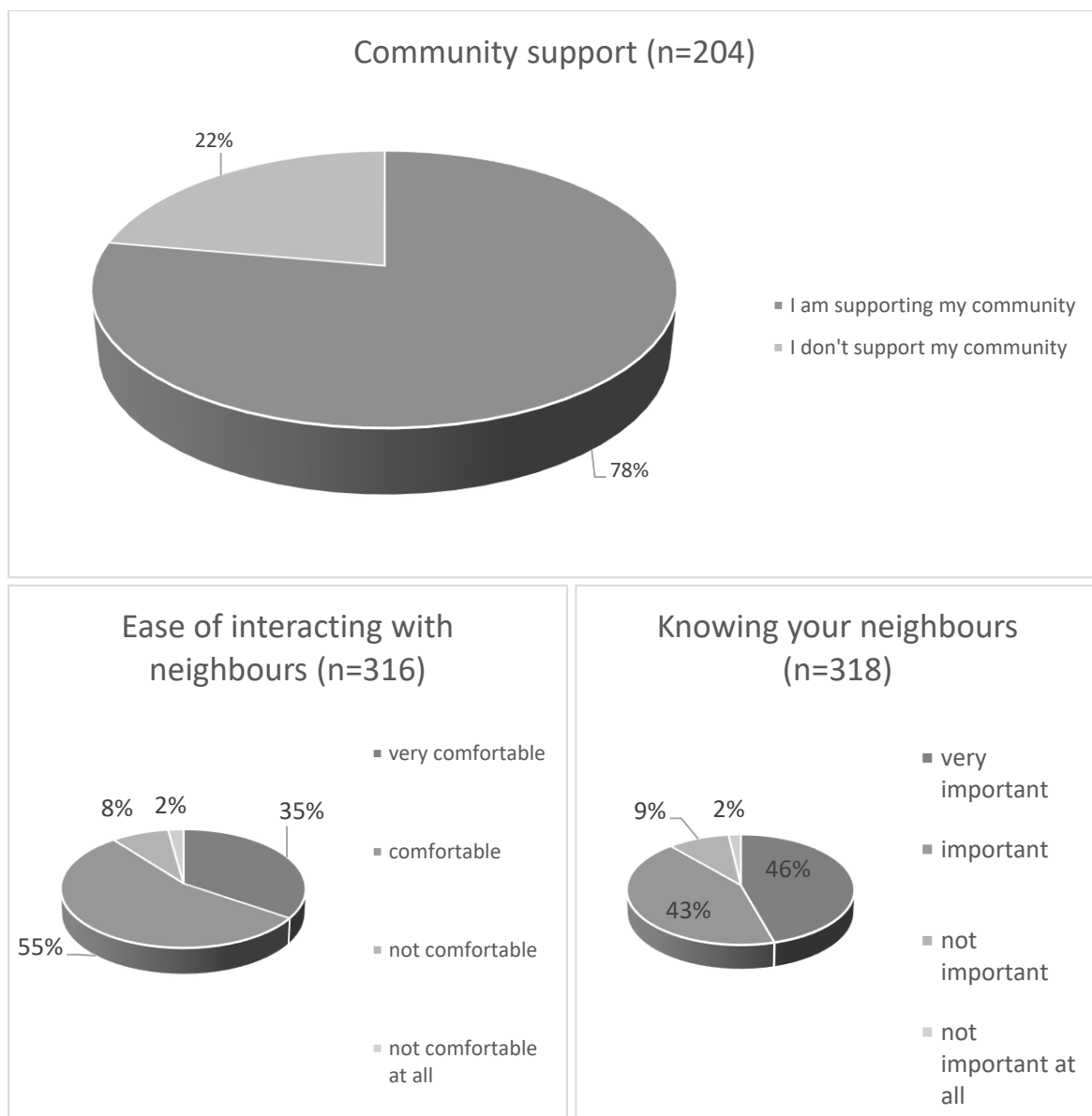


Fig. 4. Neighbourhood relationships. Source: Community Survey (LFRS and Author)

Figure 4 reveals a strong sense of knowledge about the neighbourhood and people living nearby and also captures how social relationships are sustained by talking and interacting with neighbours and by supporting the community. These findings do not support a simplistic reading of withdrawal and social isolation.¹⁰ However, while indicating a very active community where social relations with other people matter, these are mostly with people from the same community; to form such relationships, mutually shared values are a requirement [26]. While earlier research has noted the potential exclusionary effect of such values, the aim here was to understand how values contribute to the community integration that brings people together. The cultural theory of risk suggests that community norms and

¹⁰ In this context, it should be noted that the phase 1 data did not establish any correlation between level of English and fire frequency. Anecdotal evidence suggests that language issues are easily overcome by active community structure and support, as there is always someone to act as an interpreter.

values are a key resource in justifying a way of life, which impacts on understandings of how risk is to be managed. The aim here was to explore the role of these values in community formation.

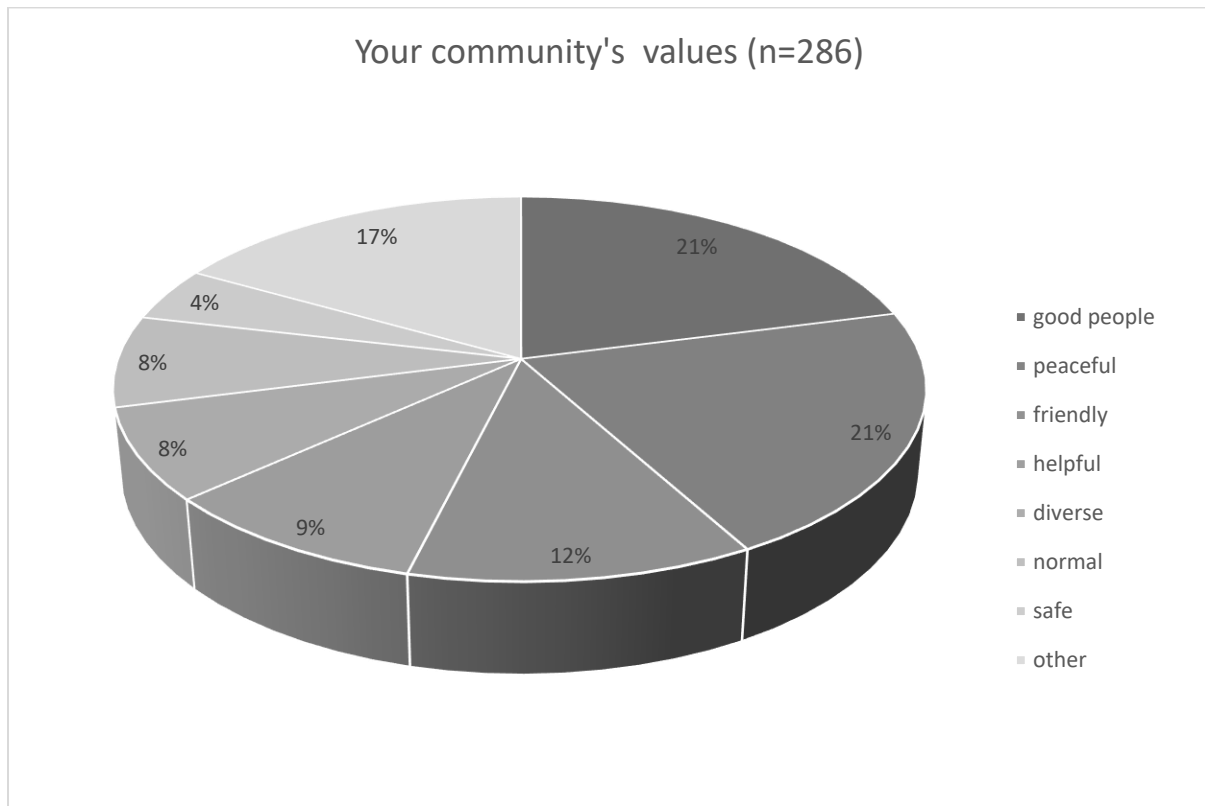


Fig. 5. Neighbourhood values. Source: Community Survey (LFRS and Author)¹¹

Figure 5 specifies the key values that define the way of life in the neighbourhood. The first five of those values describe life in terms of social relations (and in particular, good social relations) like being friendly, helpful or peaceful. In short, other people and good personal relationships are at the heart of these key norms and values, and the neighbourhood is all about community. It is striking that almost none of these key values relate to infrastructure or environmental factors such as trees, shops, schools or nightlife; instead, there is a strong sense of a social world defined by the quality of relationships with other people. Any intervention in this community must therefore take account of who these people are and what makes their relationships so personal. To address that question, the survey also asked who people turn to for help or advice and what specifically connects them to that person.

¹¹ The category 'Other' attracted no more than one notation (e.g. clean, expensive, noisy).

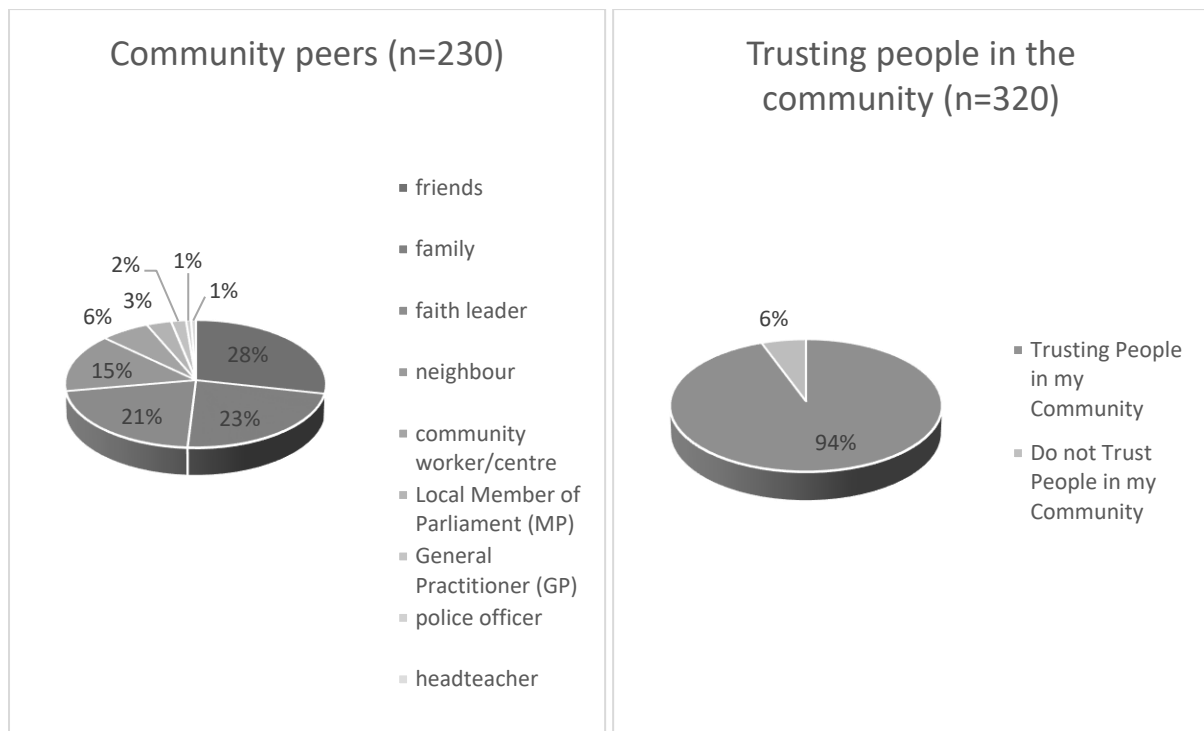


Fig. 6. Personal trust. Source: Community Survey (LFRS and Author)

The people at the centre of the community come from the community itself (Figure 6). Family and friends account for more than 50% as well as other members of the community like neighbours and local faith leaders; these four groups account for almost 90%, with others from external institutions (e.g. schools, police, local government) playing only a marginal role. The fire service was not mentioned at all. This divide between people at the centre of the community and those who play a more peripheral role might be contextualised in terms of trust or social capital. Those who enjoy regular interactions with each other (friends, family, faith leaders, neighbours) gain trust, which is founded on the ability to relate people's actions to their personality. Regular interaction enables people to get to know each other's intentions and preferences while also serving as a form of social control, as those intentions and preferences can be tested for consistency. As this is the basis for social relations grounded on personal trust [39], it is perhaps unsurprising to see (Figure 6) that trust in people from the community is as high as 94%. This is remarkable in the British context, as the latest Trust Barometer [40] ranks the United Kingdom at its lowest ever position in a global table of 28 countries, in which only Russia is a less trusting society. More specifically, the Barometer ranks trust in people in my local community [40, p. 27] at 72%—more than 20% lower than in the present study.

4.2.2. Emergency services and fire risk: The role of trust

Having identified the community's key values and practices and their emphasis on personal trust and personal relationships, it was important to understand how these might relate to risk, and how this cultural set up might explain the greater prevalence of fire incidents. To that end, the survey also gathered information on fire behaviour and relationships with the

emergency services to assess whether the personal trust that sustains the community translates into trust in external institutional services.

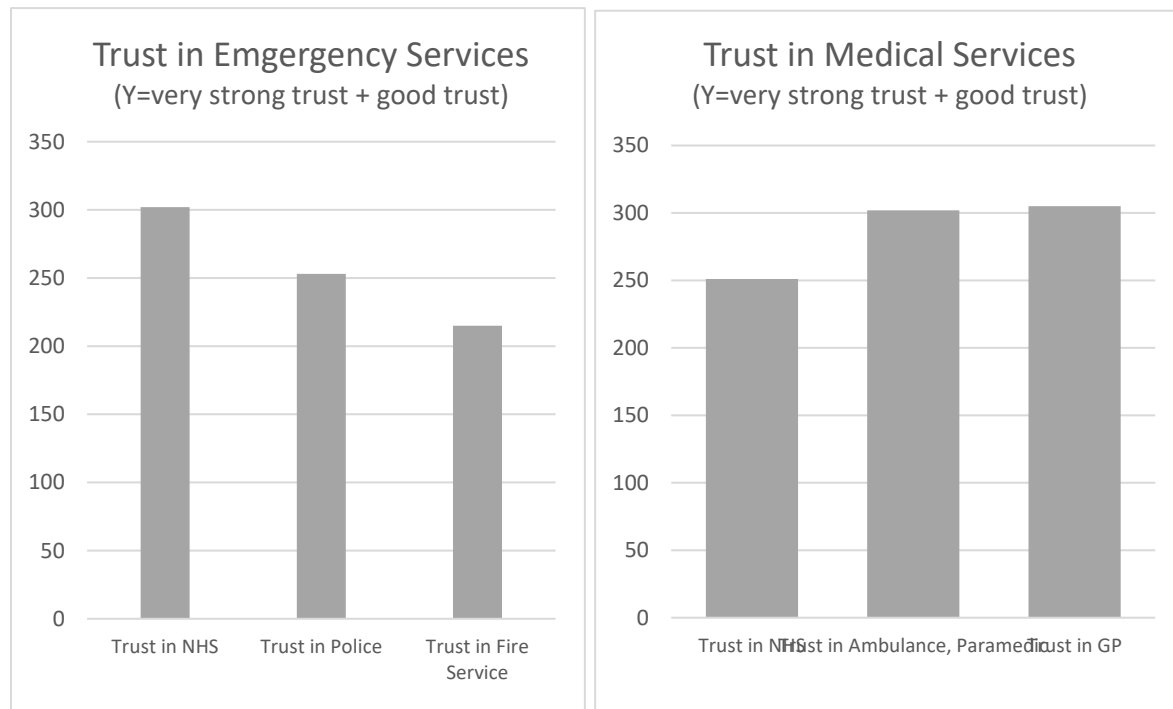


Fig. 7. Trust in Emergency Services. Source: Community Survey (LFRS and Author)

The data in Figure 7 relate to the extent of people’s trust in the Emergency Services.¹² The figures suggest in particular that the UK’s National Health Service (NHS) is relatively highly trusted as compared to the police, with the fire service in third position. This form of trust is generally referred to as institutional or system trust [41,42]. Although more abstract and principle-based, this form of trust is also influenced by what Anthony Giddens [43, p. 87] characterised as ‘representatives of abstract systems’—that is, the points of connection between individuals or collectives and abstract systems or complex institutions, which can translate personal trust into institutional trust.

Given the focus on personal trust in the community, this issue was further explored by asking respondents to differentiate between trust in the NHS as an institution and two points of connection: ambulance and GP. As Figure 7 shows, this more differentiated picture reveals that overall trust in the NHS drops while increasing in relation to the paramedic and GP. A chi-square test (p value .000, lower than 0.05) also confirmed a statistically significant relationship between the variables *trusting my neighbours* and *trusting my GP or paramedic*. As these results again highlight the role of personal trust and relationships in engaging with the local community, it seemed important to investigate whether models of engagement currently utilised by the fire service explain the lack of connection with the community and the implications for raising awareness of fire risks and fire safety.

¹² These data combine ratings of high trust and a fair amount of trust as opposed to no trust.

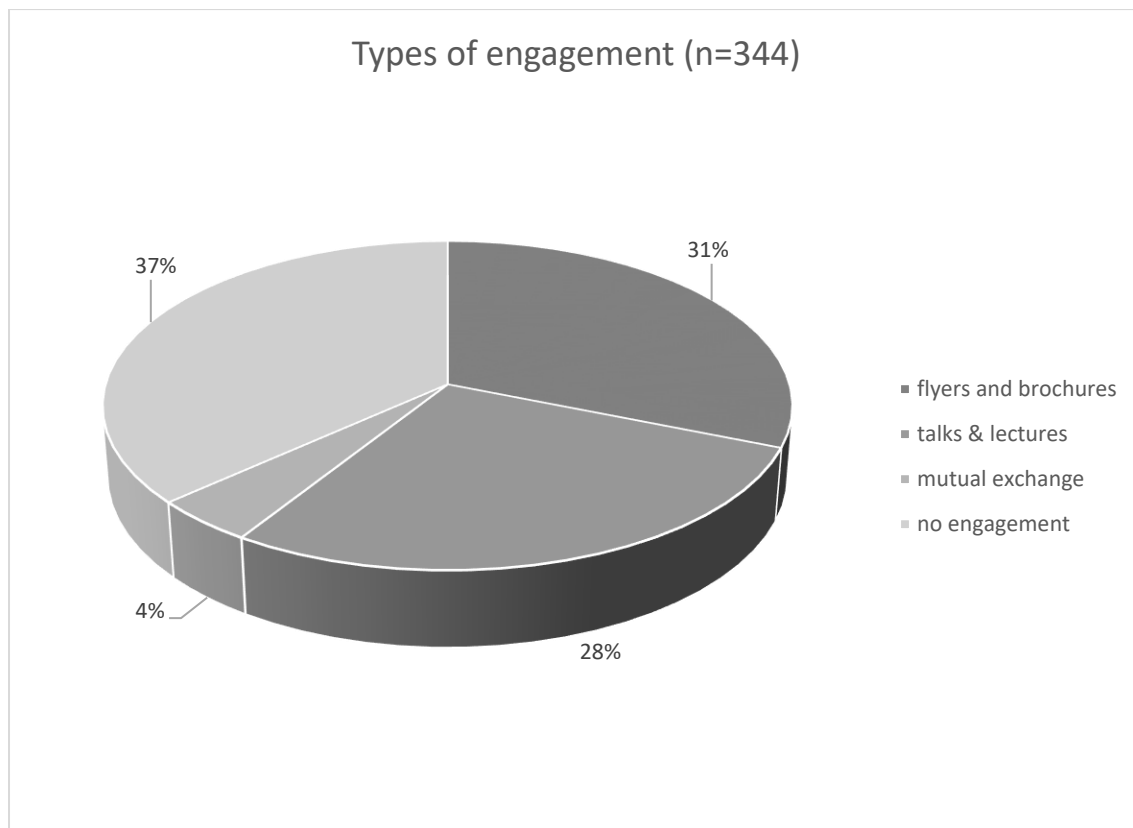


Fig. 8. Types of engagement. Source: Community Survey (LFRS and Author)

The survey asked whether people had communicated or engaged with the fire service. As shown in Figure 8, the largest number had only engaged through flyers and brochures and were therefore unlikely to have met a firefighter in person. A second form of engagement included lectures on fire safety in the home or safer cooking. However, as these community-level interactions tend to involve one-way communication, they may not enable fire service personnel to get to know members of the community, and vice versa. Personal engagement of the kind that maps most closely onto the mode of interaction within the community was reported by just 4% of respondents.

A chi-square test of mutual engagement and trust in the fire service with a p value of 0.02 (< 0.05) indicates a significant relationship between the two variables, and weak but statistically significant correlations confirm that those who were given flyers and brochures were more likely to contact a family member in case of fire (Spearman's rho 0.155) while those who had attended a lecture would turn to a neighbour (Spearman's rho 0.142). The impact of mutual engagement can be seen in some very specific measures; for instance, those who had mutual engagement with the fire service were significantly more likely to acknowledge the importance of a smoke alarm in their home (Spearman's rho 0.185). This suggests that better communication and integration with the community is a key predictor of feeling safe at home (Spearman's rho 0.233) and trusting the fire service (Spearman's rho 0.277). Trust also plays a key role, as there is also a statistically significant correlation between trust in the fire

service and feeling safer in one's home (Spearman's rho 0.151) and understanding the importance of a smoke alarm (Spearman's rho 0.139).

Limited mutual engagement means that opportunities to build trust between the fire service and the local community are likely to be limited. Weaker links to the fire service and strong links within the community may contribute to whether and how people rely or do not rely on help from the fire service. For instance, about 30% of survey respondents said that they would first contact either a family member, neighbour or friend to help with a fire in their own home.

Table 5. 'Neighbour's house is on fire'. Source: Community Survey (LFRS and Author)

check if they are in, then call the emergency services
check to see if neighbour is there
help them as much as I can
knock on door, call neighbours
make sure they are safe
reach for the fire extinguisher while helping the survivors
try and get everyone safely out before it's too bad; if bad, call fire service immediately

When respondents were asked what they would do if their neighbour's house was on fire, relying on neighbours to help was also mentioned, reflecting strong cultural values of help and support. In sum, deficits of trust seem to explain why fire incidents are likely to be more severe, as they are often initially managed by non-professionals because people look first to their community for help and support. Perhaps the strongest evidence in this regard is that nearly 16% of respondents had experienced a fire in the previous three years, but LFRS feedback statistics of incidents attended show that only about 2% of responses were from the Black community [44].

5. Conclusion and outlook: A person-centred approach to fire safety

The research presented here sought to understand the role of culture and ethnicity in residential fire incidents and their severity. Current research in this field operationalises ethnicity as a statistically aggregated individual category, which means that ethnicity is largely assimilated to other socio-demographic variables. To overcome this limitation, cultural risk theory was introduced to characterise ethnicity from the perspective of cultural values and cultures practices in order to understand how this impact upon the approach to fire risks. Consequently, this research does not dismiss ethnicity, but more importantly provides a framework how to overcome some of the methodological challenges in this area as identified by Hastie and Searle [20] and Dean et al. [23]. Therefore, ethnicity is operationalised in terms of proximity to other members of the same statistical category, we asked how this might impact on fire safety and fire risks in order to understand how ethnicity unfolds within a community of shared values and practices. General statistical indicators and LFRS and national census data proved insufficient for in-depth understanding, and a novel survey

approach was used to collect information about community structure, norms and values, as well as risk behaviour.

Analysis of the survey data yielded a number of novel insights. First, ethnicity per se is not a predictor of probability of residential fire. Although Leicester is a highly diverse and multicultural region, the data indicate that vulnerability is differently distributed across different ethnic groups, with Black people most affected. It also became clear that risk cannot be viewed as a purely individual issue because the risk of experiencing a fire is mitigated in more socially heterogeneous settings. Ethnicity must therefore be seen in more holistic terms, which means to understand ethnicity in terms of cultural norms and practices that structure life in the community. This approach revealed a very active and vibrant community life, in which knowing your neighbour and engaging with others from the community are central norms and practices. For that reason, personal trust and relationships are the key to maintaining a cohesive community. This emphasis on interaction and communication did not map easily onto current modes of engagement within the fire service, which tend to involve top-down and one-way strategies such as distributing information by means of flyers and brochures. The statistical correlations revealed that missing links in engagement and trust mean that fire service home safety services and risk prevention largely fail to penetrate the community, which contributes to greater risk.

Based on these findings, we propose that the fire service needs to develop and adopt a person-centred approach to fire safety. Person-centred approaches to health and wellbeing are now well established in therapy, nursing and counselling contexts [45,46,47] following dissatisfaction with institutionalised care and fixed codes of practice emphasising medical and behavioural management of the ‘uninformed’ client. This approach emphasises that personhood emerges in a social context: ‘personhood is not, at first, a property of the individual; rather, it is provided or guaranteed by the presence of others’ [48, p. 275]. As such, if personhood is not being recognised it can have a negative impact on a person’s sense of agency, trust and ability to interact with others. A person-centred approach takes account of individual rights, knowledge and the need for mutual interaction. Emphasis is on the ways of working *with* individuals which place them at the centre of deciding about their own fire safety and support, now and in the future. In order to deliver this agenda a person-centred community engagement training was developed and is currently implemented at the LFRS.¹³

Table 6. ‘Person-Centred Approach to Fire Safety’. Source: Author

Traditional Approach to Fire Safety	Person-Centred Approach to Fire Safety
People are told what kind of fire safety measures to apply or what not to do based on institutional guidelines.	Understand what members of the public consider as safe or unsafe. Help them to choose how to stay safe.
Members of the public do not have a continuous engagement with fire and rescue staff. The fire and rescue staff does not know the needs of the	There is a continuous approach to engagement where the same members of staff meet with the community on a regular basis to get to know

¹³ This strategy and training package will be reported in detail in another publication.

community well, so they are not familiar with their values and preferences. The research shows that members of the public do not trust fire services or have anxieties, like having to pay for their services or that they might face criminal charges.	each other and good relationships develop. Research shows that this motivates staff and makes people feel more secure.
Fire services decide about fire safety strategies, often without consulting members of the public.	Fire services seek input from members of the public, actively involves some in the decision making and training.

Table 6 compares current practices of engagement with members of the public and the shift towards a person-centred approach. The table also integrates how current practices reflect upon some of the key obstacles identified by the research, for instance, lack of mutual engagement or lack of trust. As noted in the research, trustworthiness and the lack thereof is a particular concern with a person-centred approach developing a strategy in order to engage more effectively with these communities. Engagement depends on a dialogical structure that develops a relationship in which both parties recognise each other and can learn about their respective needs and values, and about who they are. Underpinning any such exchange is the recognition that community members are people in their own right, and that life is not just about fire risks. In short, the approach on fire safety safe depends on knowing the member of the public as a person within their social context, in addition to accurately assessing fire safety risks. This means finding out how people view the fire service, how they respond to risks and how both sides can manage expectations to mitigate those risks and find a mutually agreed definition that ensures effective fire prevention and protects these communities from harm.

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References

- [1] BBC, 2018, Grenfell Tower fire: Who were the victims?, <https://www.bbc.co.uk/news/uk-40457212> (accessed 19 March 2019).
- [2] M. Duncanson, A. Woodward, P. Reid. Socioeconomic deprivation and fatal unintentional domestic fire incidents in New Zealand 1993–1998, *Fire Safety Journal* 7(2) (2002) 165–179.
- [3] A. Asgary, A. Ghaffari, J. Levy. Spatial and temporal analyses of structural fire incidents and their causes: a case of Toronto, Canada, *Fire Safety Journal* 45(1) (2010) 44–57.
- [4] M. Ahrens. US Fire Death Rates by State, National Fire Protection Association (NFPA) 2019, <https://www.nfpa.org/-/media/Files/News-and-Research/Fire-statistics-and-reports/US-Fire-Problem/osstate.pdf> (accessed 10 May 2021).

- [5] J. Webb, M.-A. Auckland. 'Fire Kills campaign': presentation at the Prevention, Protection and Road Safety Forum, 27 February 2013.
<http://www.cfoa.org.uk/download/34812> (accessed 10 January 2020).
- [6] M. Camit. Smoke alarms wake you up if there's a fire: A smoke alarm campaign targeting Arabic, Chinese, and Vietnamese communities in New South Wales, *Social Marketing Quarterly* 8(1) (2002) 52–54.
- [7] C. DiGuseppi, I. Roberts, A. Wade, M. Sculpher, P. Edwards, C. Godward, H. Pan, S. Slater. Incidence of fires and related injuries after giving out free smoke alarms: cluster randomised controlled trial, *British Medical Journal* 325(7371) (2002) 995.
- [8] J. Corcoran, G. Higgs, C. Brunson, A. Ware, P. Norman. The use of spatial analytical techniques to explore patterns of fire incidence: a South Wales case study, *Computers, Environment and Urban Systems* 31 (2007) 623–647.
- [9] J. Corcoran, G. Higgs, T. Anderson. Examining the use of a geodemographic classification in an exploratory analysis of variations in fire incidence in South Wales, UK, *Fire Safety Journal* 62 (2013) 37–48.
- [10] J. Clare, L. Garis, D. Plecas, C. R. Jennings. Reduced frequency and severity of residential fires following delivery of fire prevention education by on-duty firefighters: Cluster randomized controlled study, *Journal of Safety Research* 43(2) (2012) 123–128.
- [11] Department for Communities and Local Government, Equality and Diversity Strategy 2008–2018.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7633/equalitydiversitystrategy.pdf (accessed 1 August 2020).
- [12] D.J. Barillo, R. Goode Fire fatality study: demographics of fire victims, *Burns* 22(2) (1996) 85–88.
- [13] C.R. Jennings. Socioeconomic characteristics and their relationship to fire incidence: a review of the literature, *Fire Technology* 35(1) (1999) 7–34.
- [14] P. Chhetri, J. Corcoran, R. Stimson, R. Inbakaran. Modelling potential socio-economic determinants of building fires in south east Queensland, *Geographical Research*, 48 (1) (2010) 75–85.
- [15] Jennings, C. R. (2013) Social and economic characteristics as determinants of residential fire risk in urban neighborhoods: A review of the literature, *Fire Safety Journal* 62(Part A) 13–19.
- [16] A. Clark, J. Smith, C. Conroy. Domestic fire risk: a narrative review of social science literature and implications for further research, *Journal of Risk Research*, 18(9) (2014) 1113–1129
- [17] J. Hu, X. Shu, S. Xie, S. Tang, J. Wu, D. Deng. Socioeconomic determinants of urban fire risk: a city-wide analysis of 283 Chinese cities from 2013 to 2016, *Fire Safety Journal* 110 (2019) (no page numbers).
- [18] P. Edwards, I. Roberts, J. Green, S. Lutchmun. Deaths from injury in children and employment status in family: analysis of trends in class specific death rates, *British Medical Journal* 333(7559) (2006) 119.
- [19] S.E. Chandler, A. Chapman, S.J. Hallington. Fire incidence, housing and social conditions in the urban situation in Britain, *Fire Prevention* 35 (1984) 7–34.
- [20] R. Searle, C. Hastie. Socio-economic and demographic predictors of accidental dwelling fire rates, *Fire Safety Journal* 84 (2016) 50–56.
- [21] R. Smith, M. Wright, A. Solanki. Analysis of fire and rescue service performance and outcomes with reference to population socio-demographics, DCLG, London, 2008.
<http://goo.gl/mr7gNg> (accessed 13 March 2020).

- [22] F. Nilson, C. Bonander. Household fire protection practices in relation to socio-demographic characteristics: evidence from a Swedish national survey, *Fire Technology* 56 (2019) 1077–1098.
- [23] E. Dean, M.J. Taylor, H. Francis, A. Clark. An exploration of community and culture related fire injury risks, UKAIS 12–13 April 2016, Oxford University, Oxford, UK.
- [24] J. Tansey, T. O’Riordan. Cultural theory and risk: a review, *Health, Risk & Society* 1(1) (1999) 71–90.
- [25] I. H. Langford, S. Georgiou, I.J. Bateman, R.J. Day, R.K. Turner. Public perceptions of health risks from polluted coastal bathing waters: a mixed methodological analysis using cultural theory, *Risk Analysis* 20(5) (2000) 691–704.
- [26] V. Mamadouh. Grid-group cultural theory: an introduction, *GeoJournal* 47 (1999) 395–409.
- [27] E. Peters, P. Slovic. The role of affect and worldviews as orienting dispositions in the perception and acceptance of nuclear power, *Journal of Applied Social Psychology* 26(16) (1996), 1427–1453.
- [28] C. Marris, I. H. Langford, T. O’Riordan. A quantitative test of the cultural theory of risk perceptions: comparison with the psychometric paradigm, *Risk Analysis* 18(5) (1998) 635–647.
- [29] Leicester City Council. Diversity and migration. <https://www.leicester.gov.uk/media/177367/2011-census-findings-diversity-and-migration.pdf> (accessed 5 April 2020).
- [30] Local Government Association. LGA Research: Cohesion and Integration in Leicestershire Fire and Rescue (unpublished report) 2019.
- [31] G. Catney. Exploring a decade of small area ethnic (de-)segregation in England and Wales, *Urban Studies*, 53(8) (2016) 1691–1709. <http://researchonline.ljmu.ac.uk/id/eprint/3523/1/An%20exploration%20of%20community%20and%20culture%20related%20fire%20risks%20v12.pdf> (accessed 1 March 2020).
- [32] M. Taylor, E. Higgins, P. Lisboa, I. Jarman, A. Hussain. Community fire prevention via population segmentation modelling, *Community Development Journal* 51(2) (2016) 229–247.
- [33] Office for National Statistics. Census: Aggregate data (England and Wales), UK Data Service Census Support, 2011. <http://infuse.mimas.ac.uk> (accessed 2 September 2015).
- [34] M. Granovetter. *Getting a Job: A Study of Contacts and Careers*, University of Chicago Press. Chicago, 1995.
- [35] G. Kossinets, D. J. Watts. Origins of Homophily in an Evolving Social Network, *American Journal of Sociology* 115(2) (2009) 405–450.
- [36] E. Lazegaa, L. Mounierb, T. Snijdersc, P. Tubarod. Norms, status and the dynamics of advice networks: A case study, *Social Networks* 34(3) (2012) 323–332
- [37] L.M. Tigges, I. Browne, G.P. Green. Social isolation of the urban poor: race, class, and neighborhood effects on social resources, *Sociological Quarterly* 39(1) (1998) 53–77.
- [38] C. Campbell, C. McLean. Ethnic identities, social capital and health inequalities: factors shaping African-Caribbean participation in local community networks in the UK, *Social Science & Medicine*, 55(4) (2002) 643–657.
- [39] N. Luhmann. *Trust and Power*. Edited by C. Morgner, M. King, Polity Press, Cambridge, 2017.
- [40] D. Edelman. Trust Barometer: UK Supplement 2020. <https://edl.mn/2u6VdWN> (accessed 23 October 2020).

- [41] C. Morgner. Trust and confidence: history, theory and socio-political implications, *Human Studies: A Journal for Philosophy and the Social Sciences* 36(4) (2013) 509–532.
- [42] C. Morgner. Trust and society: suggestions for further development of Niklas Luhmann's theory of trust, *Canadian Review of Sociology* 55(2) (2018) 232–256.
- [43] A. Giddens. *Consequences of Modernity*, Polity Press, Cambridge, 1991.
- [44] Leicestershire County Council. *After the Incident Survey Results*, Leicestershire Fire and Rescue Service (unpublished report) 2020.
- [45] C.R. Rogers. *On Becoming a Person*, Boston: Houghton Mifflin, 1961.
- [46] T. Kitwood. The technical, the personal, and the framing of dementia, *Social Behaviour* 3(2) (1988) 161–179.
- [47] D. Mearns. *Developing Person-Centred Counselling*, second edition, Sage, London, 2002.
- [48] T. Kitwood, K. Bredin. Towards a Theory of Dementia Care: Personhood and Well-being, *Ageing and Society*, 12(3) (1992) 269-287.