



## **Nottinghamshire Fire and Rescue Service (NFRS) Community Safety Assessment: Part 3**

### **Data Collection Recommendations**



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## 1. Introduction

- 1.1. The following document provides recommendations regarding categories of data collected to enable the effective evaluation of community safety initiatives. There are two broad forms of evaluation within the context of Fire and Rescue Service community safety initiatives; (1) the evaluation of initiatives in terms of the extent to which they increase safety within the community, and (2) the evaluation of initiatives in terms of the extent to which they align with the needs of the community. If an initiative is not being delivered to the group or area which is in need, the actual impact it will have upon the safety of the community will be insignificant.
- 1.2. This document highlights the data collection processes which a fire and rescue service can adopt to enable them to easily identify community safety issues and subsequently be in a position to effectively target initiatives, as well as to be able to assess the likelihood of impact with a higher degree of validity.

## 2. Casualties/Incidents

- 2.1. There are currently two separate databases for (1) Nottinghamshire Fire and Rescue Service (NFRS) incidents, and (2) the individual casualties occurring from incidents. The only cross over of information between these two data sets occurs for primary fire incidents, as within the incident database a 'casualty flag variable' is completed for these incident types, in which the most serious casualty occurring within the incident is recorded in letter form (F - 'Fatality, H - 'Hospital Visit, P - 'Precautionary Check, T - 'Treated At Scene'). Analysing the primary fires incident database, it is not possible to determine the number of casualties which occurred as a result of an incident, just whether or not one or more casualties occurred as a result of an incident.
- 2.2. Consequently, with regards to primary fires, the only way to determine the proportion of casualties occurring from incidents would be to obtain totals from the incident database and the casualty database and calculate a percentage. The majority of the time this process would provide a representative view, especially if the number of casualties and incidents are large. However when dealing with small numbers of casualties and incidents it is important to be aware of exactly which casualties were a result of which incidents, otherwise potentially one extreme incident in which there were a large number of casualties could bias the data through suggesting a large proportion of incidents lead to casualties.
- 2.3. Currently it is possible to determine which casualties occurred in respect to which incidents by manually cross referencing the casualty database with the incident database. However, in order to make this process more efficient it would be extremely useful to include all the casualties which have occurred on the incident database. This could be achieved through adding additional data fields, whereby instead of only having a 'casualty flag' data field there are data fields for; 'casualty number 1', 'casualty number 2' and so on. The actual recording of the casualty, through assigning the appropriate letter based on

the classification system would remain the same, but it would enable a more efficient and accessible way of linking casualties to incidents.

- 2.4. The same method should be used for road traffic collision incidents, as currently on the incident database there is only a data field which records whether or not casualties were involved. With regards to road traffic incidents there is a need for the consistent recording of casualties across districts. A clear policy needs to be established highlighting the exact circumstances in which NFRS need to record a road traffic collision casualty. For example, should a road traffic casualty only be recorded if NFRS have to assist with rescuing them, should a casualty only be recorded if they are at the scene when NFRS arrive at the incident, or should all casualties be recorded even if the ambulance service has taken them away before NFRS arrive on scene?
- 2.5. In order to gain a more reliable understanding into the risk factors surrounding road traffic collision incidents NFRS would need to record residence details for individuals involved in incidents. The location of a road traffic collision could provide useful information regarding the relative risk of certain roads; however it is not currently possible to attribute this risk to individuals living in surrounding areas. Information highlighting where those involved in incidents live would be able to assist with the targeting of road safety initiatives.

### **Summary: Casualties/Incidents**

- *There is a need for the integration of the information concerning casualties into the overall database for incidents.*
- *A consistent recording process for road traffic collision incidents needs to be established across all districts in Nottinghamshire.*
- *The collection of residence details concerning individuals involved in road traffic collisions would provide a more valid evidence base to assist with the targeting of road safety related initiatives.*

### **3. Risk profiles for accidental dwelling fires**

#### *Data sharing with Nottingham City Homes*

- 3.1. In order to obtain more detail surrounding those at risk of experiencing an accidental dwelling fire it is useful to cross reference addresses of properties where incidents took place with social housing agencies. This process has already been carried out with Nottingham City Homes (NCH), leading to the finding that a substantial proportion of the incidents within the City of Nottingham had taken place within NCH properties. As a result, NFRS and NCH have engaged in collating data in order to develop a far more detailed profile of those who are at risk of being involved in an accidental dwelling fire, to better inform both organisations' strategies for combating domestic fires.
- 3.2. The process has proved to be beneficial to both organisations by bringing together detailed information on the causes of incidents held by NFRS and information on the individuals involved in these incidents held by NCH. This has also raised awareness of cases where the incident was reported to NCH

but not NFRS, and vice versa. Additional information obtained by NFRS has included whether the individual has physical or mental health problems, the ages of the individuals within the property, and more reliable information surrounding household occupancy. Although household occupancy information is collected by NFRS after an incident it is more reliable from the social housing organisations; using this process incidents have been identified where the household occupancy originally recorded by NFRS was incorrect.

- 3.3. In order to develop a richer data set for accidental dwelling fires, which will enable more meaningful analysis to support a vulnerable person's profile, the data sharing method used with NCH should be used as a template to support the introduction of this method with other social housing organisations across Nottinghamshire.

#### *Incident Recording System*

- 3.4. It would be hugely beneficial for NFRS to begin to collect information regarding the ages of all individuals in a property which has experienced an accidental dwelling fire. Currently NFRS only record the ages of accidental dwelling fire casualties. If there was information highlighting the ages of all those involved in incidents NFRS would have a much richer data set to enable the analysis of risk in relation to age. The justification in collecting this information is the argument that whether or not an incident resulted in a casualty is determinant upon an element of chance. Therefore the information surrounding an incident will be just as useful for developing risk profiles as the information surrounding incidents which have resulted in a casualty. There could even be a justification in collecting the same level of detail (which is collected for accidental dwelling fire incidents/accidental dwelling fire casualties) regarding false alarms in dwellings.
- 3.5. In recent years additional information has been collected surrounding accidental dwelling fires by NFRS. The main additions have been the recording of the household occupancy group of the property (lone person, couple with children, lone parent) and the involvement of human factors (the involvement of alcohol, distraction).
- 3.6. Through collecting this additional data trends are already beginning to form; for example cooking related fires are a major issue amongst all age groups but for different reasons. Human factor data has identified that accidental dwelling fire casualties through cooking related fires are more likely to occur due to the influence of alcohol amongst young people and as a result of distraction amongst elderly people. However there are a large number of incidents which have the human factor variable stated as being unknown. Therefore if this data field was more consistently completed, through retrospective data capture most realistically, more meaningful trends could be established, leading NFRS to develop a problem solving approach to fire safety in the home, whereby the different issues surrounding different groups of people are identified and addressed.
- 3.7. Currently within the data capture of human factors surrounding accidental dwelling fires there is only an option to record one human factor for an

incident. However, the involvement of human factors is not mutually exclusive. For example, distraction, falling asleep and the influence of alcohol could all be attributed to one incident. Therefore the option to record multiple human factors should be introduced.

- 3.8. In order to be in a position to identify meaningful trends it is useful to group variables into broader categories. For example the current classification of household occupancy groups is; (1) more than two adults with children, (2) more than two adults without children, (3) couple with children, couple without children, (4) lone parent and (5) lone person. These classification groups should be maintained but in addition the following broader categories should be used; lone person, adults with children, and adults without children. Similarly, when the age of casualties is recorded a number of age categories should be developed; one data field should have relatively specific age categories, while the other should be far broader. For instance one data field could have categories which split age groups by five years, whereas the second could split age categories by 10-15 years.
- 3.9. The mosaic groups of properties which have experienced an accidental dwelling fire could be grouped into broader categories; for example through grouping together all properties which are classified as social housing, all properties which are likely to house people on social benefits and all houses which are likely to contain elderly people. It is important to consider that if there are too many variables being used to analyse a relatively small dataset trends will not be established.
- 3.10. There are a number of issues surrounding the current classifications of the causes of accidental dwelling fires. The cause of every accidental dwelling fire is classified as cooking, electrical, heating, naked flame, or other cause. However it could be argued that an accidental dwelling fire caused as a result of heating is not mutually exclusive from either an electrical or naked flame related fire, as a heating related fire which is not either electrical or naked flame related is unlikely to occur. In addition to this each accidental dwelling fire is assigned a sub-cause, the most prominent of which are fires caused by the cooker, chip pan, smoking and wiring. However with regards to the sub-causes of the cooker and wiring, these are still quite general as there are many different ways in which a fire surrounding a cooker or wiring could have started. Therefore for these two sub-cause categories it could be beneficial to have a further breakdown of sub-causes within them, in order to gain a more specific understanding of the issues surrounding these incidents.

#### *Cross referencing internal databases*

- 3.11. NFRS need to cross reference their databases to collate information in order to build a more detailed picture, as there may be limited information recorded on the Incident Recording System (IRS) about a casualty. If they had previously had a Home Safety Check (HSC) there could be more detailed information about resident and their property on Community Fire Risk Management Information System (CFRMIS). In addition further information

could have been established as a result of a fire investigation report into the incident, which is carried out if a fire leads to a fatality or severe casualty.

- 3.12. Obtaining the addresses of where dwelling fires take place would enable one to establish, using CFRMIS, whether a Home Safety Check or any other kind of intervention (such as a fire investigation) has been carried out on the property. However, some difficulty would be encountered, as it is not always clear whether the occupier who is referred to when the HSC is carried out is the same person as the casualty (especially if there is no name/half a name recorded on IRS or CFRMIS), as they may no longer live at the address.
- 3.13. Cross referencing the two databases enables one to match up addresses but not necessarily an individual. Therefore, the risk involved in this analysis would be the person who lived in the property when the HSC was carried out may not be the same person who was living in the property when the incident occurred. A cross referencing exercise between IRS data and CFRMIS data found that of 700 dwelling fires 200 had occurred at a property where a HSC had previously been carried out. Therefore there are 200 incidents for which HSC data could potentially provide additional information.

#### **Summary: Risk profiles for accidental dwelling fires**

- *In order to obtain more detail surrounding those at risk of experiencing an accidental dwelling fire it is extremely useful to cross reference the addresses of the properties where incidents occurred with social housing agencies. This information sharing process has been carried out with Nottingham City Homes, allowing NFRS to obtain far more detailed information surrounding the circumstances of those involved in accidental dwelling fires.*
- *The same level of detailed information recorded for accidental dwelling fire casualties should be recorded for those individuals involved in accidental dwelling fire incidents, as it could be strongly argued that the information surrounding an incident will be just as useful for developing risk profiles as the information surrounding incidents which have resulted in a casualty.*
- *When categorising a number of the variables surrounding an accidental dwelling fire incident (the age of the casualty, the mosaic group of the property, the household occupancy of the property) it would be beneficial to develop broader categories, in addition to the current more specific categories. It is important to consider that if there are too many variables being used to analyse a relatively small dataset trends will not be established.*
- *There is a need for a revision of the current classification system regarding the causes and sub causes of accidental dwelling fires and the human factors involved.*
- *The integration of relevant information from CFRMIS into the IRS system would contribute towards more detailed risk profiles surrounding the individuals involved in accidental dwelling fire incidents.*

#### **4. Considering external variables**

- 4.1. It is important to emphasise that when assessing the impact an initiative may have had upon the frequency of a certain incident type, cause and effect is

difficult to establish, due to the wide range of external variables. However, through taking into consideration a number of external variables, such as demographic trends, incident data from other public services and incident data from other fire and rescue services, a much stronger argument can be formed regarding the impact of an initiative on a specific incident type. External variables are also extremely useful in assisting with the risk profiles of the communities in Nottinghamshire, as simply analysing NFRS incident data only provides limited information regarding levels of risk. Additional data sets which highlight other forms of risk outside of the incidents NFRS have attended, as well as the overall placement of NFRS incident trend rates into context through drawing comparisons with similar areas, can assist with the targeting of community safety initiatives.

### *Demographic trends*

- 4.2. When data has been collected to establish a particular group within the community or an area which is at a disproportionately high risk of experiencing a particular type of incident, the changes in the population levels amongst the group or within the area need to be monitored. For instance NFRS incident data shows that the elderly age group are disproportionately at risk of being involved in accidental dwelling fire. In recent years the population within the older age groups has increased at rates higher than any of the other age groups, both locally and nationally. This information illustrates a potentially increased risk, particularly within the districts which have experienced increase rates amongst the elderly age groups which exceed the overall regional and national increase rates. Within certain districts the elderly age groups make up a greater proportion of the population than they do overall at regional and national levels, indicating a greater level of risk. The same process could be relevant for other forms of demographic information, such as ethnic groups, if it could be demonstrated that a particular group was at a disproportionate risk.
- 4.3. This information could also be useful when evaluating the impact of community safety initiatives. For instance in recent years NFRS have experienced a reduction in the number of accidental dwelling fire casualties they have attended, suggesting that this could be in part due to the community safety initiatives of NFRS. Alternatively, it could be argued that if the population has changed a proportion of any change observed in the number of casualties might be attributed to this. However, in this instance the population within the high risk age group has increased, thus providing an additional set of evidence to support the positive impact of community safety initiatives.
- 4.4. It would be beneficial to collect information regarding the breakdown of the population within districts, amongst age groups (both broad age groups and more specific age groups) and amongst ethnic groups. The information has already been documented within the 'Demographic trends across Nottinghamshire report' for 2006/07 – 2010/11, but should be collected on a yearly basis at least so trends remain up-to-date. Broad age groups would mean that the population would be split into the following categories; 0-15, 16-29, 30-44, 45-59, 60-74 and 75 and over. More specific age groups analyse the breakdown in population for the following categories; 0-4, 5-9, 10-14 etc.

- 4.5. It is useful to collect information which is produced through the census, specifically within the context of developing risk profiles relating to accidental dwelling fires. NFRS incident data has clearly highlighted that people who live on their own are at a greater risk of experiencing an accidental dwelling fire. Therefore the information which will be provided through the 2011 census, highlighting the number of lone person properties within different districts and wards within Nottinghamshire, will be useful in contributing to the risk profiles of the communities surrounding accidental dwelling fires; in conjunction with the other variables associated with increased risk such as age and location.
- 4.6. Information documenting the demographic composition of wards and districts within Nottinghamshire providing more context and meaning could be placed into the data on the incident recording system. Simply assessing the percentages of incidents in Nottinghamshire which each district accounts for will usually demonstrate that the City accounts for a far greater proportion of incidents than any other district; even after periods in which it has observed significant reductions. However, part of the reason this occurs is that the City of Nottingham accounts for a far greater proportion of the population in comparison to any other district. **Weighted percentages** (*please refer to the NFRS evaluation toolkit for details regarding calculations*) allow one to assess risk more clearly by indicating the likelihood of an incident occurring within a particular group or area, through weighting the number of incidents in relation to the population of the group or locale. This enables the identification of areas or groups which have experienced a disproportionate number of incidents. For example, when looking at all incidents 40% may have taken place in area A while only 10% may have taken place in area B. However due to the very large population in area A and the very small population in area B the weighted percentage would be greater for area B. This is because the risk in area B would be greater than in area A; demonstrated by the fact that if 100 people were randomly selected from each area it would be more likely that those from area B would have been involved in an incident than those in area A. It is important to note however that weighted percentages should be used with caution and should be used in conjunction with, and not in isolation from, overall percentages. This is because when dealing with very small numbers the use of weighted percentages is not appropriate and has the potential to be misleading if not analysed within the context of actual figures.

#### *External Incident Data*

- 4.7. NFRS produce community safety initiatives specifically focused on reducing anti-social behaviour, reducing risk, and increasing safety. The only information recorded which would begin to assess the levels of risk in relation to anti-social behaviour are incidents involving deliberate fire-setting. However there are many other variables which could contribute to NFRS' risk profile of anti-social behaviour risks across the county. Nottinghamshire County Council have information regarding the time and location of the following categories of criminal behaviour (all of which could increase the accuracy of NFRS' integrated risk management plan and also potentially enable a clearer assessment of the impact of interventions): notable offences recorded by the police (violence against the person, all wounding or act endangering life,



harassment, common assault, robbery, theft from the person, criminal damage including arson, burglary, theft of a motor vehicle, theft from a motor vehicle); hate crime; hoax calls to all emergency services; incidences of fly-tipping; incidences of youth offending, and; East Midland Ambulance data concerning road traffic collision casualties and victims of burns.

- 4.8. This information can be used in conjunction with NFRS incident data in order to determine the likelihood of community safety initiatives impacting upon the number of incidents. For instance in recent years deliberate secondary fires have decreased considerably across Nottinghamshire. It could be argued that this could be attributed to the work of the police in terms of deterring criminal activity. However, when combining all the criminal acts which are categorised under notable acts recorded by the police the rate of decrease is far smaller than the rate of decrease observed amongst deliberate secondary fires. This would suggest that this reduction can't solely be attributed to the same factor(s) causing the overall reductions seen in criminal behaviour. Therefore an additional factor must be contributing towards the reduction observed in this type of incident; thus providing support for the impact of NFRS community safety initiatives.

#### *Incident trends of other fire and rescue services*

- 4.9. When assessing the changes in the number of incidents NFRS attend and the impact of community safety initiatives it is difficult to control for the wide range of external variables. However, if trends within a county or district differ significantly to those observed generally across the region and/or country one can assume that something specific is having an impact, meaning that the entire cause behind the change in incidents cannot be completely attributed to a variable which affects an entire region or country, such as changes in legislation or safer household appliances.
- 4.10. In recent years deliberate road vehicle fires have reduced by 69% across Nottinghamshire, while across England they have decreased by 56% and 57% when the metropolitan service areas are not included. Therefore although it is likely that there is an overall driver impacting upon this reduction across the country, the additional reductions observed in Nottinghamshire suggest some impact from the interventions of NFRS, as the rate of decrease is greater than the national pattern.
- 4.11. When carrying out this process the rates of change in a certain incident type within specific districts should be benchmarked against the overall rate of change across Nottinghamshire. Then these results should be benchmarked against the accumulation of the change in the number of the specific incident type, (1) over the same time period; (2) across all the fire and rescue services within the East Midlands (Derbyshire, Nottinghamshire, Leicestershire, Lincolnshire, Northamptonshire); (3) across all fire and rescue services within the NFRS' 'Family Group 4' benchmarking group for England (Avon, Cheshire, Cleveland, Derbyshire, Essex, Hampshire, Hereford and Worcester, Hertfordshire, Humberside, Kent, Lancashire, Leicestershire, Lincolnshire, Nottinghamshire, Staffordshire, Surrey); (4) across all fire and rescue services

in England not including the metropolitan services (the metropolitan services are Greater London, Greater Manchester, Merseyside, South Yorkshire, Tyne and Wear, West Midlands, West Yorkshire), and; (5) across all fire and rescue services in England including the metropolitan services.

- 4.12. It could also be the case that interventions are having the same positive effect nationally, which is an argument that could be formed if incidents were increasing and decreasing at very similar rates across the country. However, if a reduction figure is greater than the regional and national figures then this increases the likelihood of an initiative being responsible for a proportion of the reduction and provides stronger evidence to support a positive impact.
- 4.13. The information regarding the incident rates of all other UK fire and rescue services can be obtained from the Department for Communities and Local Government (DCLG) website;  
<http://www.communities.gov.uk/publications/corporate/statistics/monitorq1q42011>.
- 4.14. By taking into consideration the combination of demographic trends, incident data from other organisations, and the incident data of other fire and rescue services, NFRS will be in a more informed position to be able to develop risk profiles and assess the impact of initiatives which aim to decrease incidents. If none of these methods demonstrate anything conclusive, the impact of NFRS' initiatives on the number of incidents attended is unknown.

#### **Summary: Considering external variables**

- *When analysing NFRS incident data it is useful to do so in conjunction with overall demographics. This can be achieved through calculating weighted percentages, which enables the assessment of risk more clearly by indicating the areas or groups which have experienced a disproportionate number of incidents.*
- *When analysing NFRS incident data in order to assess the levels of risk in a community or the impact of an initiative, it should not be studied in isolation. In order to assist with both the pre evaluation (identifying a safety issue which needs addressing) and post evaluation stages (assessing the impact of an initiative) NFRS need to collect information concerning the incident rates of other fire and rescue services, demographic trends, and incident data from other public sector organisations, so that any changes in incident rates can be placed into context.*
- *When assessing the impact which an intervention has had upon the number of incidents which have taken place cause and effect is difficult to fully establish. However, taking into consideration additional variables builds a stronger case regarding impact.*

## **5. The collection of community safety intervention data**

- 5.1. When considering the extent to which an impact assessment can be carried out regarding NFRS community safety initiatives, an important consideration is the detail of the information recorded concerning initiatives. An impact assessment can be carried out with the knowledge of the initiatives which NFRS carry out across the county and the over-arching aims of the community safety work which is undertaken at district level. However, numerous details

concerning (1) when an initiative took place, where it took place; (2) how long it took place for (or if it is ongoing exactly when and where it takes place); (3) and who received the initiative is not consistently recorded across the service for all community safety initiatives.

- 5.2. This level of detail would enable a more reliable impact assessment, and would mean that NFRS would be able to capture positive impacts that would not have previously been possible. For example, accidental road vehicle fires have decreased within Nottinghamshire and within a number of the districts within Nottinghamshire at a rate far in excess of that observed regionally or nationally. However, the impact assessment (*see NFRS Impact Assessment*) investigating the likelihood of NFRS' community safety initiatives in contributing to a proportion of this decrease concluded an uncertain outcome. This was due to a lack of information recorded to suggest that NFRS specifically focus upon messages to educate the community upon car related fire safety, as well as the fact that there are a huge number of external factors which could influence the safety of cars and subsequently whether they are likely to be at risk of fire. As information concerning district specific initiatives is not consistently recorded in detail it could have been the case that at some point one of the districts administered, or was involved in, an initiative focused upon car fire safety. Consequently, if this initiative occurred within an area before a period in which it experienced a rate of decrease in accidental road vehicle fires there would be additional evidence to support the impact of NFRS' community safety initiatives in contributing to the reduction. This form of evaluation would only be relevant for demonstrating the impact of those initiatives which specifically aim to reduce incidents.
- 5.3. There is thus a need for a central database which records all community safety activity (where and when and to whom an initiative has been delivered). All community safety activity refers to county wide and district specific community safety initiatives, engagement with schools, any community safety event and any community safety partnership. This will be achieved through ensuring that every community safety initiative is recorded in detail on CFRMIS. This would also enable analysis to take place centrally to determine whether the allocation of community safety resources aligns with the risk levels across the community to better target future initiatives.
- 5.4. With regards to educational initiatives, information should be recorded regarding the number of schools in each area receiving a specific initiative (Risk Watch, Danger Zone) along with the estimated number of pupils who have received the initiatives. This would ensure that all schools are receiving educational initiatives and that if any areas are receiving a higher volume of educational initiatives they should be areas with higher risk on the basis of the number of incidents experienced or demographic risk categories.
- 5.5. It could be argued that initiatives delivered to school children could have an impact upon incident numbers many years later, so if a fire and rescue service analysed whether or not there had been a significant change in the number of incidents occurring between 10 and 15 years after the education intervention was delivered, in comparison to the time it when it was delivered, they could

begin to align this form of initiative to a reduction in incidents. However, attempting forming this link would be tenuous, considering the wide range of external variables which could have impacted upon individuals over time.

- 5.6. In reality the most effective methods to use in order to assess impact of educational initiatives within the short term would be to measure knowledge and attitudes before and after an initiative, in order to establish a baseline from which any changes can be compared. Additionally, the strategic targeting and prioritisation of educational initiatives on the basis of risk, if resources are limited, would demonstrate a practical and efficient use of pre-evaluation techniques.
- 5.7. A method which could be used in order to evaluate NFRS community safety youth intervention programmes, which are received by individuals who have been involved, or are at a high risk of being involved in anti-social behaviour, could be to identify whether individuals who have received the intervention (on the basis that personal data regarding names of those attending the programmes are recorded by NFRS) have subsequently been involved in any criminal activity. In theory this would be an extremely useful way to provide one form of evaluation for these initiatives. However, the practicalities of gaining such information could be extremely difficult due to data protection legislation. Sharing this form of personal data to NFRS would not satisfy the schedule 2 conditions of the act.

***Summary: The collection of community safety intervention data***

- *The consistent recording of more detailed information concerning initiatives, particularly surrounding district specific community safety initiatives, would enable NFRS to conduct an impact assessment which could more accurately capture the impacts of initiatives.*
- *Information needs to be recorded on CFRMIS detailing (1) when an initiative occurred; (2) where it occurred; (3) for how long it took place, and; (4) who received the initiative.*