

# Targeted Residential Fire Risk Reduction

A Summary of At-Risk Areas in the United Kingdom



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## Background

Reducing fires and saving lives is a mandate for all Fire Services. Globally, many departments have implemented door-to-door campaigns to educate their citizens on fire reduction and safety (TriData, 2009). However, focusing on an entire community is expensive, time consuming, and overall, an inefficient use of limited resources. A 2007 TriData report on best practices in residential fire safety in England, Scotland, Sweden, and Norway identified that “of all the best practices identified in this study, one stands out. To reduce fire casualties in the home, the British fire service is *visiting large number of high-risk households* [emphasis added] to do fire safety inspections and risk reductions, especially to ensure they have a working smoke detector” (TriData, 2007, p.vi). Similarly, in the publication, the *Reduced Frequency and Severity of Residential Fires Following Delivery of Fire Prevention Education by On-Duty Fire Fighters: Cluster Randomized Controlled Study* Clare, Garis, Plecas, and Jennings (2012) reviewed best practices from other countries on residential fire safety and concluded that “targeted home visits have produced promising results examining a range of outcome measures, from reduction in rates of fires and fire-related casualty through to increased presence of working smoke alarms when residences were audited” (p. 123).

Research has substantiated that certain groups are at an elevated risk of experiencing fires. In particular, children under the age of 6 , older adults over the age of 64 (e.g. Jennings, 1996; LeBlanc et al., 2006; Scholer, Hickson, Mitchel & Ray, 1998; U.S. Fire Administration, 1997, 2004), and those living in socio-economic disadvantage (e.g., Jennings, 1999; Schaenman et al., 1990; Shaw, McCormick, Kustra, Ruddy & Casey, 1988; U.S. Fire Administration, 1997, 2004) are the populations most at-risk for experiencing a residential fire. Residential fires also account for the vast majority of fire fatalities (Chien & Wu, 2008), typically as a result of smoke inhalation or carbon monoxide poisoning (Miller, 2005). Young children and older adults are also at higher risk of dying from a residential fire due to their inability to hear and/or respond to a smoke alarm (Marshall, Runyan, Bangdiwala, Linzer, Sacks, & Butts, 1998). Residents of low socio-economic areas are also at greater risk (Miller, 2005; Duncanson, Woodward, & Reid, 2002), primarily due to their tendency not to have a working smoke alarm in the home.

Aware of these relative risk levels, the Surrey Fire Services engaged in an evidence-based smoke alarm distribution campaign, known as the HomeSafe program, that targeted high-risk locations in the city identified in an analysis of 20 years of municipal fire incidence data (McCormick, 2009). The program mandate was to have all homes with working smoke alarms in order to reduce the number of residential fires, as well as fire-related injuries and deaths within the community. To achieve this, firefighters conducted door-to-door visits with all addresses in the identified zones where they distributed fire safety education materials, which included information on high-risk groups, and identified the leading causes of residential fires in the city (i.e. cooking and non-smoking related open flame fires, such as candles or matches; McCormick, 2009). They also asked residents about the presence of working smoke alarms, and offered to install smoke alarms free of charge if one was not present in the home (Clare et al., 2012). Educational material was left for those not at home to read and educate themselves on fire safety. Over a four-year period, over 38,000 residential dwellings in high-risk zones were visited by fire services.

To review the effect of this distribution methodology, Clare and colleagues (2012) conducted an experimental study measuring the outcomes in the high-risk zones receiving the targeted outreach compared to a randomized control sample of equally high-risk areas that had not received the targeted outreach. The specific analysis conducted to identify the high-risk population for the City of Surrey is summarized as follows:

First, the specific addresses of all relevant types of residential fires that had occurred in the city since late 2006 were mapped, and high-density areas were identified. In addition to this, Census information was used to identify areas of the city that would be expected to have an elevated likelihood of experiencing fires. This use of Census data built on research evidence that demonstrates an elevated risk of experiencing fire as a function of individual characteristics. As a result, areas of interest were identified if they had a proportionally high representation of: (a) children under 6 years, (b) adults aged over 64, (c) single parent families, (d) high-residential mobility residents, (e) unemployed residents. (Clare, et al., 2012, p.125)

The authors statistically compared the rate of residential fire incidents occurring two years pre-intervention against the rate of residential fire incidents two years post-intervention occurring in the experimental and control locations. Whereas the control locations experienced a 15% reduction in residential fires over time, the experimental locations experienced a 64% reduction. In addition, the length of time between fires increased by only 4 days in the control locations, versus 193 days in the experimental locations (Clare et al., 2012). In other words, the evidence-based fire education and smoke alarm distribution methodology that targeted high-risk locations both statistically and substantially reduced the rate of residential fires in high-risk jurisdictions and increased the length of time between fires. This study therefore provided definitive evidence for the increased efficiency and effectiveness of using local fire data to guide education and distribution campaigns.

As of September 2018 Surrey Fire Services has made contact with approximately 59,000 residents through the HomeSafe program and have installed over 2,400 smoke alarms in homes. The program has been an overwhelming success. Working smoke alarms have increased from 25% in 2008 to 54% in 2017. Casualty rates (injuries and fatalities combined) saw a 53% reduction and fire rates reduced by 60% between the years 2006 and 2017. This program provides an effective model that can be easily adopted by fire services in other communities to better achieve their mandate of reducing fires and saving lives.

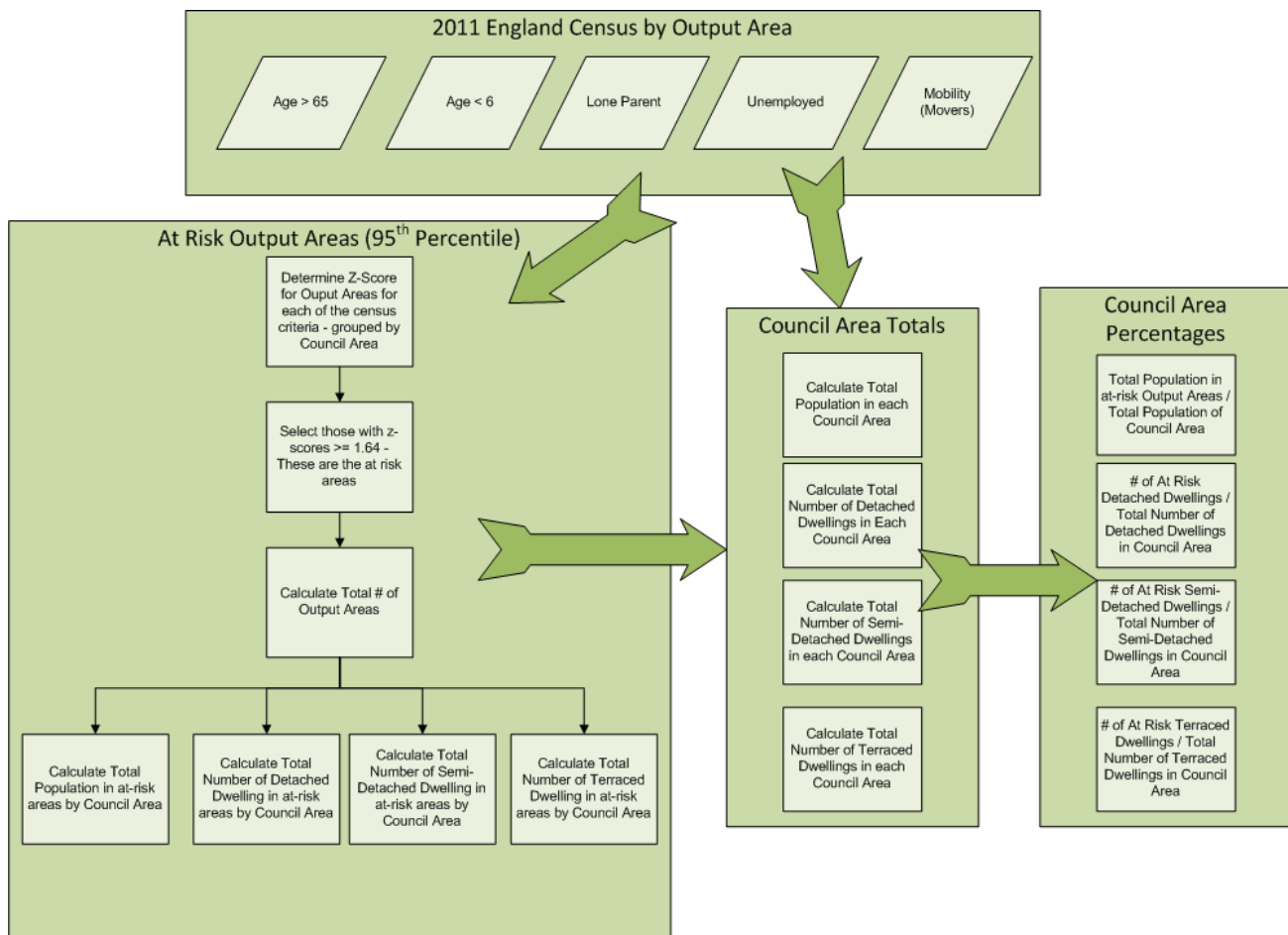
## Summary for England

Using the 2011 Census, the HomeSafe criteria – residents over age 65 and under age 6, lone parent families, frequent movers, and the unemployed – was evaluated to determine the output areas within council areas that would be at most risk for fires to occur in their home. The primary focus of the HomeSafe initiative is on detached, semi-detached and terraced dwellings. Residences that are regularly inspected through mandated annual inspections are excluded from the program. Figure 1 details the process flow to calculate the values (output area counts and sums for detached, semi-detached and terraced dwellings and population) for at risk areas and total values for the council areas.

Council areas included in the analysis are:

- Metropolitan districts (36)
- London boroughs (32) and the City of London
- Unitary Authorities (55) and the Isles of Scilly
- County Councils (27) (UK Government, 2018).

**FIGURE 1: PROCESS FLOW FOR DATA ANALYSIS & CALCULATIONS**



Based on the methodology shown on the previous page, the totals for England are:

- Total number of output areas is 171,372
- Total number of detached dwellings is 5,128,552
- Total number of semi-detached dwellings is 7,076,395
- Total number of terraced dwellings is 5,642,969
- Total population is 53,012,456
- Total number of at-risk output areas is 38,068
- Total number of at-risk detached dwellings is 963,818
- Total number of at-risk semi-detached dwellings is 1,477,917
- Total number of at-risk terraced dwellings is 1,545,312
- Total population in at-risk areas is 13,656,466
- The percentage of at-risk output areas is 22.21%
- The percentage of at-risk detached dwellings is 18.79%
- The percentage of at-risk semi-detached dwellings is 20.89%
- The percentage of at-risk terraced dwellings is 27.38%
- The percentage of at-risk population in at-risk areas is 25.76%

Output areas are used as “they are the lowest level of geography across census topics, and the average population in England output areas is 309 people” (Office for National Statistics(12), 2011).

Based on the methodology in Figure 1, Table 1 provides a national summary of at-risk populations in England. The table provides information for four main categories of interest to the fire service. First, the number of at-risk population within output areas and total population in output areas within England are compared to produce the percent of at-risk population. It is important to note that population includes all residents (not just those in detached, semi-detached and terraced housing). Second, the number of at-risk detached dwellings within output areas and total number of detached dwellings in output areas within England are compared to produce the percent of at-risk detached dwellings. Third, the number of at-risk semi-detached dwellings within output areas and total number of semi-detached dwellings in output areas within England are compared to produce the percent of at-risk semi-detached dwellings. Finally, the number of at-risk terraced dwellings within output areas and total number of terraced dwellings in output areas within England are compared to produce the percent of at-risk terraced dwellings.

**TABLE 1: ENGLAND SUMMARY FOR AT-RISK DWELLING AND POPULATION BASED ON HOMESAFE CRITERIA**

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
<b>England Grand Total</b>	13,656,466	53,012,456	25.76%	963,818	5,128,552	18.79%	1,477,917	7,076,395	20.89%	1,545,312	5,642,969	27.38%



## Council Area Review

The following section contains a map of England showing council areas, output areas and output areas by council area at-risk. Again, the HomeSafe criteria used to identify these populations in the 2011 Census were:

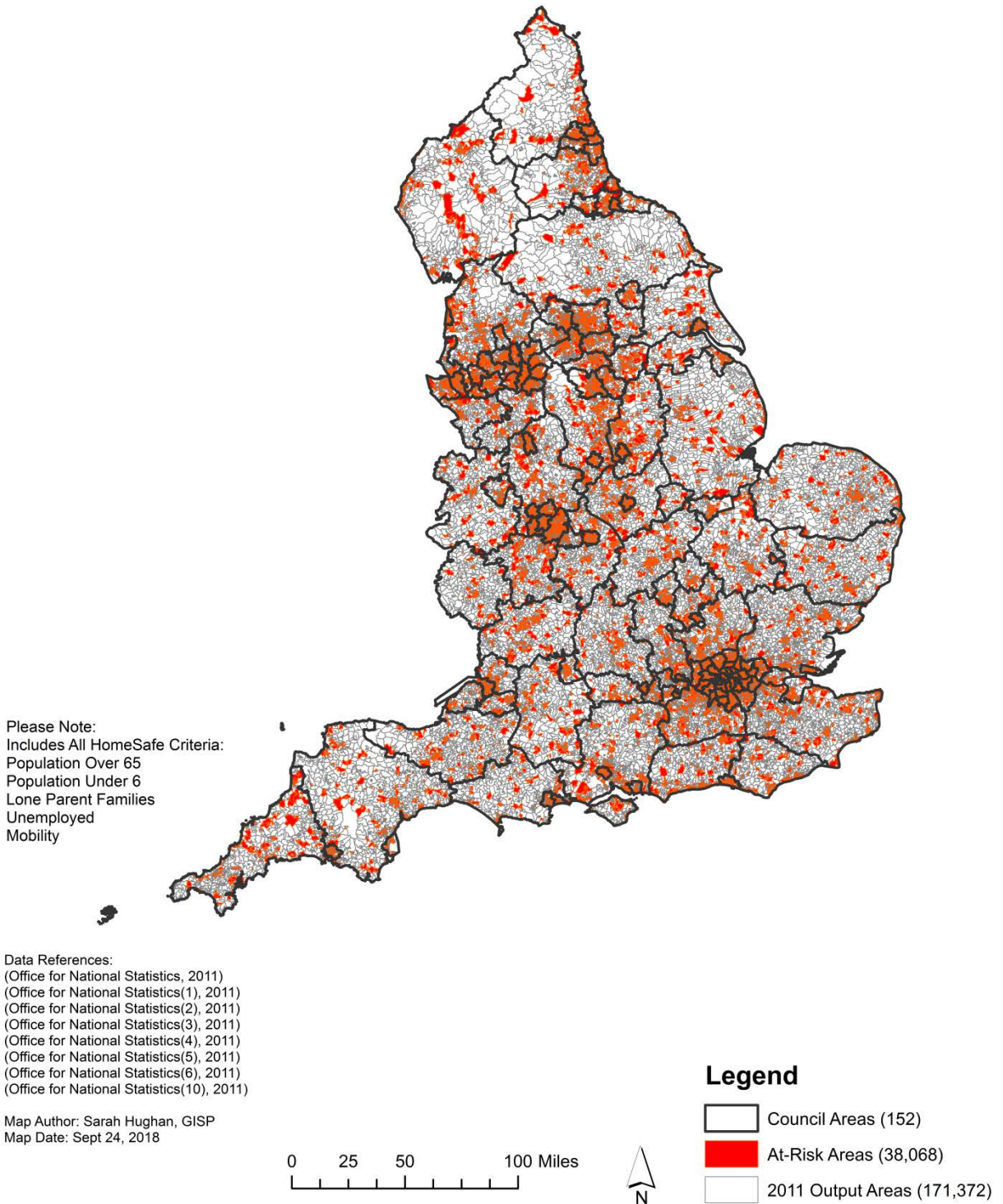
- Age Over 65;
- Age Under 6;
- Lone Parent;
- Movers (reside at current residence for less than a year);
- Unemployed; and

As well, a table (Table 2) summarizing the following information for each council area in England:

- Total at-risk population in output areas for the council area;
- Total population in output areas for the council area;
- Percentage of at-risk population that resides in the council area;
- Total at-risk detached dwelling in the council area;
- Total number of detached dwellings the council area;
- Percentage of at-risk detached dwellings in the council area;
- Total at-risk semi-detached dwelling in the council area;
- Total number of semi-detached dwellings in the council area;
- Percentage of at-risk semi-detached dwellings in the council area;
- Total at-risk terraced dwelling in the council area;
- Total number of terraced dwellings in the council area;
- Percentage of at-risk terraced dwellings in the council area

The results presented below are intended to highlight an estimate of households and population that are at-risk for residential fires. However, a more thorough analysis using local planning data (zoning and addressing), municipal distribution of residential structure fires over a five-year period, and identification of the at-risk areas using census data would refine the at-risk properties for each particular jurisdiction.

# ENGLAND – MAP OF AT-RISK OUTPUT AREAS BY COUNCIL AREA USING HOMESAFE CRITERIA



**TABLE 2: ENGLAND –POPULATION AND DWELLING TYPE AT-RISK (BASED ON HOMESAFE CRITERIA) BY COUNCIL AREA**

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Barking and Dagenham	41,347	185,911	22.24%	542	2,831	19.15%	2,454	13,895	17.66%	4,311	32,983	13.07%
Barnet	88,464	356,386	24.82%	2,987	15,372	19.43%	7,282	41,644	17.49%	5,183	22,729	22.80%
Barnsley	63,362	231,221	27.40%	6,478	23,187	27.94%	11,980	47,159	25.40%	7,267	26,317	27.61%
Bath and North East Somerset	47,630	176,016	27.06%	3,891	16,524	23.55%	5,270	21,350	24.68%	5,384	21,318	25.26%
Bedford	40,460	157,479	25.69%	2,749	18,554	14.82%	4,344	21,776	19.95%	4,591	14,818	30.98%
Bexley	48,027	231,997	20.70%	1,344	6,891	19.50%	5,360	42,035	12.75%	4,921	23,554	20.89%
Birmingham	295,444	1,073,045	27.53%	12,671	46,449	27.28%	26,074	147,412	17.69%	33,487	125,101	26.77%
Blackburn with Darwen	48,639	147,489	32.98%	1,808	8,242	21.94%	5,254	16,963	30.97%	8,598	27,179	31.63%
Blackpool	38,503	142,065	27.10%	1,571	5,924	26.52%	4,451	25,279	17.61%	6,251	20,771	30.09%
Bolton	71,581	276,786	25.86%	3,430	19,681	17.43%	9,181	41,803	21.96%	11,571	42,171	27.44%
Bournemouth	53,328	183,491	29.06%	5,429	26,989	20.12%	3,890	11,494	33.84%	1,980	5,429	36.47%
Bracknell Forest	25,331	113,205	22.38%	1,927	12,883	14.96%	1,607	9,648	16.66%	3,170	14,885	21.30%
Bradford	152,786	522,452	29.24%	5,699	29,081	19.60%	16,607	74,068	22.42%	20,064	71,595	28.02%
Brent	79,392	311,215	25.51%	2,090	7,402	28.24%	5,403	27,064	19.96%	3,708	19,191	19.32%
Brighton and Hove	73,788	273,369	26.99%	3,558	12,897	27.59%	6,688	24,174	27.67%	6,936	26,001	26.68%
Bristol, City of	105,813	428,234	24.71%	2,902	11,164	25.99%	9,685	49,983	19.38%	11,043	63,331	17.44%
Bromley	75,966	309,392	24.55%	4,865	24,890	19.55%	6,653	40,474	16.44%	7,107	29,223	24.32%
Buckinghamshire	116,053	505,283	22.97%	9,726	73,097	13.31%	13,576	62,334	21.78%	9,737	38,509	25.28%
Bury	50,186	185,060	27.12%	3,016	14,699	20.52%	7,569	30,939	24.46%	7,090	24,269	29.21%
Calderdale	55,248	203,826	27.11%	2,997	13,115	22.85%	5,518	25,239	21.86%	9,412	39,566	23.79%
Cambridgeshire	160,701	621,210	25.87%	17,288	93,644	18.46%	16,675	78,575	21.22%	14,999	51,876	28.91%
Camden	62,340	220,338	28.29%	661	1,961	33.71%	843	4,179	20.17%	1,777	9,040	19.66%
Central Bedfordshire	60,198	254,381	23.66%	5,405	30,656	17.63%	7,404	36,801	20.12%	7,509	27,482	27.32%
Cheshire East	91,789	370,127	24.80%	9,756	58,368	16.71%	11,800	53,498	22.06%	12,221	35,582	34.35%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Cheshire West and Chester	85,440	329,608	25.92%	8,257	43,673	18.91%	9,544	52,927	18.03%	11,827	32,082	36.86%
City of London	1,638	7,375	22.21%	3	22	13.64%	3	12	25.00%	11	80	13.75%
Cornwall	133,218	532,273	25.03%	19,132	97,594	19.60%	14,098	63,331	22.26%	15,314	59,153	25.89%
County Durham	131,654	513,242	25.65%	9,562	44,287	21.59%	19,301	85,322	22.62%	21,597	89,782	24.05%
Coventry	82,431	316,960	26.01%	3,977	13,788	28.84%	8,679	36,805	23.58%	11,144	57,450	19.40%
Croydon	97,055	363,378	26.71%	5,187	18,622	27.85%	6,821	37,337	18.27%	7,947	38,851	20.46%
Cumbria	124,593	499,858	24.93%	12,295	61,310	20.05%	17,789	77,041	23.09%	18,744	73,274	25.58%
Darlington	28,814	105,564	27.30%	2,054	8,407	24.43%	3,357	18,283	18.36%	4,954	15,198	32.60%
Derby	74,700	248,752	30.03%	4,692	24,580	19.09%	8,724	41,182	21.18%	10,766	24,904	43.23%
Derbyshire	206,144	769,686	26.78%	23,925	110,475	21.66%	33,826	134,321	25.18%	21,551	71,498	30.14%
Devon	188,915	746,399	25.31%	21,697	123,207	17.61%	18,510	86,646	21.36%	23,053	82,205	28.04%
Doncaster	73,615	302,402	24.34%	5,548	30,115	18.42%	10,660	58,631	18.18%	11,132	30,944	35.97%
Dorset	100,911	412,905	24.44%	12,523	79,079	15.84%	9,124	43,026	21.21%	11,048	38,467	28.72%
Dudley	79,124	312,925	25.29%	5,816	28,835	20.17%	15,137	64,870	23.33%	5,719	21,636	26.43%
Ealing	83,547	338,449	24.69%	1,626	6,964	23.35%	5,666	29,118	19.46%	4,974	33,563	14.82%
East Riding of Yorkshire	80,403	334,179	24.06%	8,962	51,268	17.48%	10,716	54,026	19.83%	9,444	29,791	31.70%
East Sussex	144,030	526,671	27.35%	14,297	78,428	18.23%	13,039	59,238	22.01%	14,145	44,070	32.10%
Enfield	71,511	312,466	22.89%	1,997	8,546	23.37%	4,517	28,797	15.69%	5,539	38,116	14.53%
Essex	303,547	1,393,587	21.78%	29,167	183,880	15.86%	31,535	186,930	16.87%	35,022	128,720	27.21%
Gateshead	56,811	200,214	28.38%	2,388	9,759	24.47%	9,419	38,617	24.39%	6,561	24,928	26.32%
Gloucestershire	150,017	596,984	25.13%	14,490	82,550	17.55%	18,963	91,114	20.81%	15,808	52,961	29.85%
Greenwich	59,400	254,557	23.33%	1,055	4,380	24.09%	3,471	19,255	18.03%	4,832	32,040	15.08%
Hackney	75,739	246,270	30.75%	585	1,927	30.36%	1,382	4,428	31.21%	4,042	15,931	25.37%
Halton	30,919	125,746	24.59%	2,071	10,703	19.35%	3,834	18,078	21.21%	5,477	19,911	27.51%
Hammersmith and Fulham	53,220	182,493	29.16%	394	1,205	32.70%	1,330	4,135	32.16%	4,077	17,323	23.54%
Hampshire	315,912	1,317,788	23.97%	30,407	193,666	15.70%	29,921	149,048	20.07%	36,312	126,291	28.75%
Haringey	72,409	254,926	28.40%	1,404	4,519	31.07%	2,870	10,040	28.59%	7,043	28,833	24.43%
Harrow	56,669	239,056	23.71%	2,218	10,252	21.63%	5,209	33,827	15.40%	3,506	16,053	21.84%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Hartlepool	23,306	92,028	25.32%	1,781	6,963	25.58%	2,692	13,714	19.63%	4,164	15,768	26.41%
Havering	54,458	237,232	22.96%	1,710	10,823	15.80%	6,839	40,405	16.93%	5,594	26,166	21.38%
Herefordshire, County of	45,519	183,477	24.81%	5,756	35,021	16.44%	5,309	22,585	23.51%	4,639	14,165	32.75%
Hertfordshire	286,040	1,116,062	25.63%	18,224	98,931	18.42%	28,267	131,113	21.56%	34,735	131,578	26.40%
Hillingdon	67,996	273,936	24.82%	4,232	15,051	28.12%	7,279	37,387	19.47%	4,402	23,430	18.79%
Hounslow	66,377	253,957	26.14%	985	4,596	21.43%	5,707	28,467	20.05%	4,227	22,286	18.97%
Isle of Wight	34,822	138,265	25.18%	3,660	23,164	15.80%	4,381	19,067	22.98%	3,365	10,573	31.83%
Isles of Scilly	601	2,203	27.28%	49	442	11.09%	90	316	28.48%	75	226	33.19%
Islington	55,237	206,125	26.80%	223	1,093	20.40%	477	2,845	16.77%	2,428	13,402	18.12%
Kensington and Chelsea	42,257	158,649	26.64%	223	1,169	19.08%	720	2,809	25.63%	2,259	10,868	20.79%
Kent	340,979	1,463,740	23.30%	28,973	159,426	18.17%	34,690	193,930	17.89%	39,708	157,343	25.24%
Kingston upon Hull, City of	73,481	256,406	28.66%	2,517	8,215	30.64%	7,751	31,375	24.70%	13,884	57,334	24.22%
Kingston upon Thames	34,709	160,060	21.68%	1,686	8,317	20.27%	3,414	20,617	16.56%	2,164	11,764	18.40%
Kirklees	112,461	422,458	26.62%	7,018	36,923	19.01%	13,876	59,537	23.31%	15,866	61,338	25.87%
Knowsley	38,454	145,893	26.36%	2,598	8,094	32.10%	5,800	25,869	22.42%	5,905	22,148	26.66%
Lambeth	84,753	303,086	27.96%	925	3,260	28.37%	2,771	10,946	25.32%	4,847	21,850	22.18%
Lancashire	295,918	1,171,339	25.26%	21,062	114,689	18.36%	32,732	173,322	18.89%	47,974	164,859	29.10%
Leeds	217,670	751,485	28.97%	9,791	48,361	20.25%	26,503	122,757	21.59%	28,759	88,726	32.41%
Leicester	93,851	329,839	28.45%	3,320	13,390	24.79%	10,185	44,880	22.69%	10,126	40,290	25.13%
Leicestershire	163,996	650,489	25.21%	19,158	101,257	18.92%	23,509	106,482	22.08%	14,388	44,250	32.52%
Lewisham	71,522	275,885	25.92%	1,023	3,868	26.45%	3,313	15,588	21.25%	6,680	33,402	20.00%
Lincolnshire	173,384	713,653	24.30%	24,516	145,817	16.81%	20,553	92,744	22.16%	17,690	51,483	34.36%
Liverpool	124,920	466,415	26.78%	3,588	15,080	23.79%	12,363	59,429	20.80%	22,591	87,732	25.75%
Luton	65,846	203,201	32.40%	2,588	9,772	26.48%	7,036	30,616	22.98%	6,891	19,068	36.14%
Manchester	161,977	503,127	32.19%	3,551	10,634	33.39%	17,084	64,967	26.30%	21,257	64,692	32.86%
Medway	62,530	263,925	23.69%	3,058	15,031	20.34%	6,078	32,487	18.71%	10,051	44,980	22.35%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Merton	55,240	199,693	27.66%	1,062	4,701	22.59%	3,562	14,732	24.18%	7,614	31,138	24.45%
Middlesbrough	42,381	138,412	30.62%	2,247	8,171	27.50%	6,017	24,004	25.07%	7,145	19,773	36.14%
Milton Keynes	68,119	248,821	27.38%	5,442	28,781	18.91%	5,968	28,636	20.84%	8,914	28,006	31.83%
Newcastle upon Tyne	92,505	280,177	33.02%	2,784	9,447	29.47%	9,966	41,054	24.28%	10,292	32,049	32.11%
Newham	80,337	307,984	26.08%	1,608	6,982	23.03%	2,732	10,941	24.97%	8,434	37,272	22.63%
Norfolk	193,467	857,888	22.55%	24,477	154,210	15.87%	20,660	114,641	18.02%	22,465	76,955	29.19%
North East Lincolnshire	45,090	159,616	28.25%	4,400	15,003	29.33%	4,864	23,782	20.45%	7,467	24,009	31.10%
North Lincolnshire	42,378	167,446	25.31%	4,082	24,793	16.46%	6,369	30,385	20.96%	4,661	10,823	43.07%
North Somerset	53,359	202,566	26.34%	5,635	30,398	18.54%	5,437	27,476	19.79%	4,979	14,463	34.43%
North Tyneside	55,031	200,801	27.41%	2,519	9,674	26.04%	9,458	39,436	23.98%	6,603	23,569	28.02%
North Yorkshire	146,861	598,376	24.54%	13,260	90,405	14.67%	17,871	86,310	20.71%	18,777	61,261	30.65%
Northamptonshire	178,474	691,952	25.79%	15,127	88,615	17.07%	21,026	96,302	21.83%	23,604	76,296	30.94%
Northumberland	82,296	316,028	26.04%	8,264	37,247	22.19%	12,207	52,263	23.36%	11,878	41,652	28.52%
Nottingham	99,373	305,680	32.51%	6,234	19,407	32.12%	10,904	41,107	26.53%	10,795	37,654	28.67%
Nottinghamshire	200,297	785,802	25.49%	24,172	123,592	19.56%	30,129	131,391	22.93%	19,414	57,729	33.63%
Oldham	70,645	224,897	31.41%	2,138	11,466	18.65%	7,288	31,456	23.17%	12,851	38,340	33.52%
Oxfordshire	171,645	653,798	26.25%	11,743	77,546	15.14%	18,738	86,460	21.67%	16,489	60,573	27.22%
Peterborough	54,751	183,631	29.82%	5,031	20,851	24.13%	5,755	23,918	24.06%	6,607	19,376	34.10%
Plymouth	69,802	256,384	27.23%	3,704	12,220	30.31%	6,284	33,245	18.90%	7,937	37,987	20.89%
Poole	36,466	147,645	24.70%	3,243	26,101	12.42%	3,348	13,566	24.68%	2,691	8,236	32.67%
Portsmouth	54,851	205,056	26.75%	1,197	3,667	32.64%	3,366	13,809	24.38%	6,529	39,699	16.45%
Reading	49,380	155,698	31.72%	2,212	7,992	27.68%	4,422	16,686	26.50%	6,159	20,024	30.76%
Redbridge	67,911	278,970	24.34%	1,597	6,920	23.08%	4,624	26,849	17.22%	7,156	35,256	20.30%
Redcar and Cleveland	35,818	135,177	26.50%	2,986	11,112	26.87%	5,432	27,265	19.92%	5,636	17,358	32.47%
Richmond upon Thames	47,330	186,990	25.31%	1,851	6,932	26.70%	4,866	19,947	24.39%	5,194	22,290	23.30%
Rochdale	59,057	211,699	27.90%	3,142	13,761	22.83%	7,150	30,151	23.71%	8,838	32,888	26.87%
Rotherham	68,411	257,280	26.59%	5,446	23,643	23.03%	11,460	54,727	20.94%	8,283	21,806	37.98%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Rutland	11,505	37,369	30.79%	1,606	7,466	21.51%	1,095	4,382	24.99%	895	2,894	30.93%
Salford	63,176	233,933	27.01%	1,926	9,327	20.65%	7,643	37,458	20.40%	7,365	30,761	23.94%
Sandwell	78,556	308,063	25.50%	2,907	14,273	20.37%	10,318	55,270	18.67%	9,279	33,357	27.82%
Sefton	70,243	273,790	25.66%	3,875	18,752	20.66%	9,071	56,512	16.05%	9,943	23,915	41.58%
Sheffield	157,855	552,698	28.56%	7,314	33,901	21.57%	17,473	86,386	20.23%	17,560	64,830	27.09%
Shropshire	79,842	306,129	26.08%	10,331	53,529	19.30%	10,344	45,289	22.84%	8,025	22,807	35.19%
Slough	35,549	140,205	25.36%	1,406	5,190	27.09%	2,920	14,478	20.17%	3,222	14,669	21.96%
Solihull	46,845	206,674	22.67%	3,813	24,984	15.26%	4,931	33,110	14.89%	4,711	13,928	33.82%
Somerset	141,813	529,972	26.76%	13,887	77,435	17.93%	16,556	72,850	22.73%	18,236	56,775	32.12%
South Gloucestershire	57,504	262,767	21.88%	4,971	29,001	17.14%	6,410	37,523	17.08%	7,086	30,140	23.51%
South Tyneside	36,095	148,127	24.37%	1,408	5,598	25.15%	6,350	28,697	22.13%	4,783	20,818	22.98%
Southampton	67,783	236,882	28.61%	2,881	13,336	21.60%	4,944	26,029	18.99%	4,769	21,324	22.36%
Southend-on-Sea	42,205	173,658	24.30%	2,354	12,512	18.81%	3,855	24,457	15.76%	3,420	14,479	23.62%
Southwark	80,859	288,283	28.05%	982	2,659	36.93%	2,068	7,912	26.14%	4,260	19,705	21.62%
St. Helens	44,113	175,308	25.16%	3,002	11,460	26.20%	8,110	36,729	22.08%	6,062	23,951	25.31%
Staffordshire	199,741	848,489	23.54%	19,222	122,067	15.75%	26,836	139,170	19.28%	20,921	63,797	32.79%
Stockport	65,698	283,275	23.19%	5,316	26,832	19.81%	8,945	51,895	17.24%	8,420	27,074	31.10%
Stockton-on-Tees	53,256	191,610	27.79%	4,448	19,943	22.30%	7,586	33,720	22.50%	6,461	19,365	33.36%
Stoke-on-Trent	65,311	249,008	26.23%	3,327	15,814	21.04%	11,661	49,966	23.34%	9,060	33,094	27.38%
Suffolk	175,683	728,163	24.13%	19,585	114,335	17.13%	19,444	99,997	19.44%	21,326	72,301	29.50%
Sunderland	70,615	275,506	25.63%	2,910	14,006	20.78%	12,247	53,627	22.84%	9,899	38,523	25.70%
Surrey	258,640	1,132,390	22.84%	23,921	155,969	15.34%	28,065	137,758	20.37%	19,492	74,156	26.29%
Sutton	51,648	190,146	27.16%	2,623	8,530	30.75%	4,234	22,450	18.86%	5,306	20,573	25.79%
Swindon	57,756	209,156	27.61%	3,379	19,273	17.53%	6,803	26,622	25.55%	8,626	29,103	29.64%
Tameside	61,858	219,324	28.20%	2,722	11,204	24.29%	8,518	37,173	22.91%	9,992	35,438	28.20%
Telford and Wrekin	43,183	166,641	25.91%	3,436	20,945	16.40%	5,236	25,001	20.94%	5,991	15,534	38.57%
Thurrock	38,556	157,705	24.45%	1,350	7,609	17.74%	3,805	21,022	18.10%	4,476	20,610	21.72%
Torbay	34,180	130,959	26.10%	3,099	14,088	22.00%	2,934	15,012	19.54%	3,778	15,143	24.95%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Tower Hamlets	65,426	254,096	25.75%	341	1,252	27.24%	659	2,626	25.10%	2,317	10,987	21.09%
Trafford	57,818	226,578	25.52%	2,825	14,622	19.32%	7,219	42,812	16.86%	7,621	20,948	36.38%
Wakefield	87,240	325,837	26.77%	6,645	30,316	21.92%	16,543	64,079	25.82%	8,688	34,315	25.32%
Walsall	70,774	269,323	26.28%	4,212	20,187	20.86%	9,461	46,779	20.22%	7,543	24,739	30.49%
Waltham Forest	60,377	258,249	23.38%	1,136	4,586	24.77%	4,040	16,668	24.24%	6,520	36,698	17.77%
Wandsworth	84,119	306,995	27.40%	717	3,338	21.48%	2,302	9,995	23.03%	7,846	32,907	23.84%
Warrington	52,439	202,228	25.93%	4,122	20,826	19.79%	7,681	36,023	21.32%	6,016	21,162	28.43%
Warwickshire	137,792	545,474	25.26%	12,367	67,542	18.31%	16,486	80,643	20.44%	16,990	54,911	30.94%
West Berkshire	36,998	153,822	24.05%	3,726	21,875	17.03%	4,515	21,198	21.30%	3,231	11,542	27.99%
West Sussex	215,105	806,892	26.66%	21,418	107,608	19.90%	18,160	93,923	19.33%	23,957	76,739	31.22%
Westminster	67,116	219,396	30.59%	394	1,371	28.74%	595	2,183	27.26%	2,024	9,317	21.72%
Wigan	90,234	317,849	28.39%	5,708	24,523	23.28%	16,764	63,829	26.26%	12,419	39,291	31.61%
Wiltshire	123,392	470,981	26.20%	12,022	70,890	16.96%	15,402	62,583	24.61%	12,764	44,213	28.87%
Windsor and Maidenhead	36,532	144,560	25.27%	2,970	18,992	15.64%	3,497	15,426	22.67%	2,786	11,432	24.37%
Wirral	83,797	319,783	26.20%	6,348	24,382	26.04%	9,928	59,823	16.60%	13,076	36,170	36.15%
Wokingham	37,444	154,380	24.25%	4,824	27,840	17.33%	3,905	18,065	21.62%	3,141	9,107	34.49%
Wolverhampton	55,003	249,470	22.05%	3,720	16,659	22.33%	7,428	47,409	15.67%	4,897	18,822	26.02%
Worcestershire	131,132	566,169	23.16%	12,162	83,156	14.63%	15,505	82,072	18.89%	13,304	46,203	28.79%
York	50,559	198,051	25.53%	3,823	18,983	20.14%	7,090	30,800	23.02%	4,821	21,224	22.71%
<b>Grand Total</b>	<b>13,656,466</b>	<b>53,012,456</b>	<b>25.76%</b>	<b>963,818</b>	<b>5,128,552</b>	<b>18.79%</b>	<b>1,477,917</b>	<b>7,076,395</b>	<b>20.89%</b>	<b>1,545,312</b>	<b>5,642,969</b>	<b>27.38%</b>

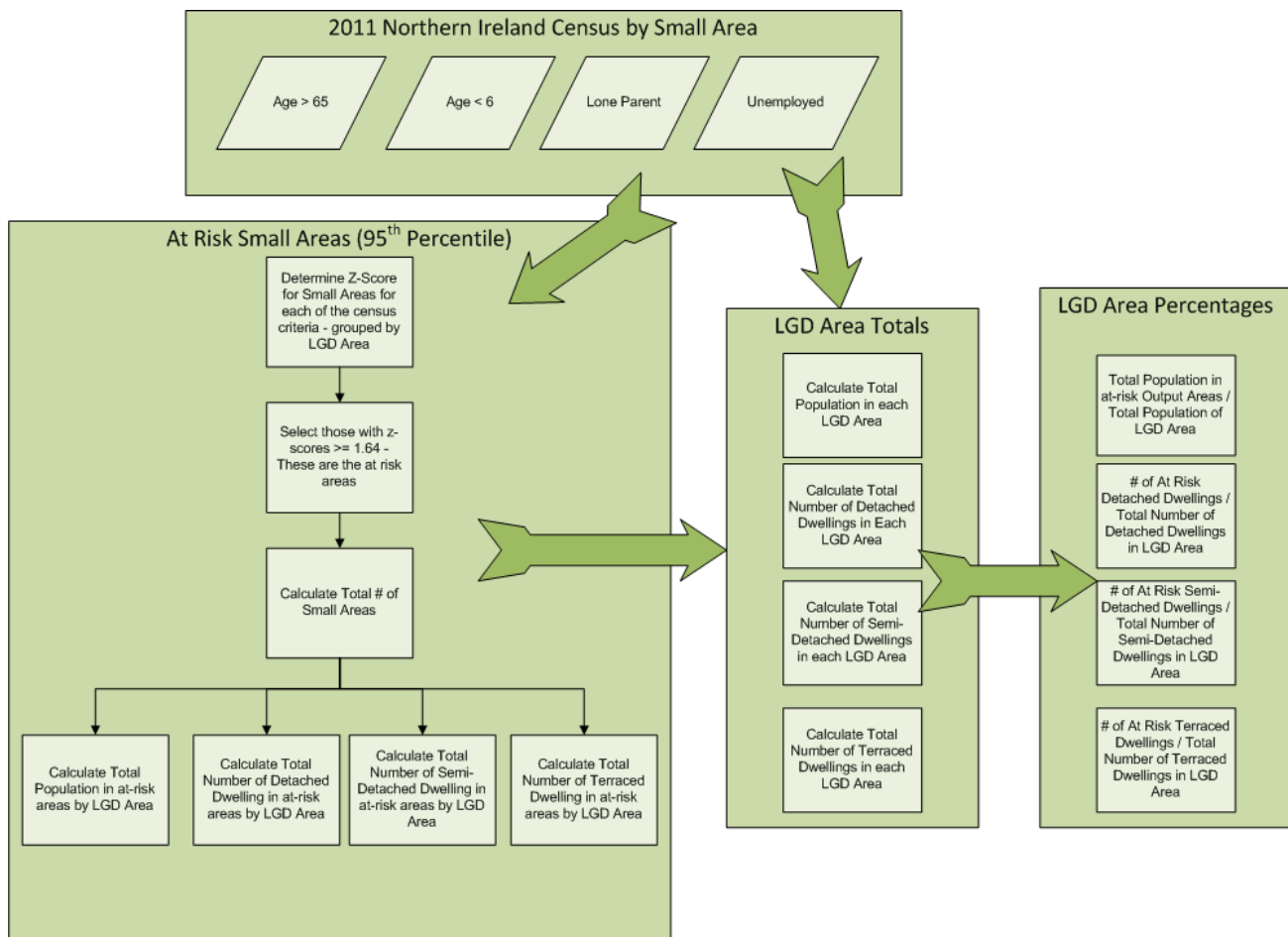
The majority of council areas (92%) have 20-30% of their populations living in areas at-risk for residential fires. With the exception of Southwark, all other council areas have less than 35% of their detached dwellings in areas of elevated risk of residential fires. There are four council areas (Blackburn with Darwen, Bournemouth, Hackney, and Hammersmith and Fulham) that have over 30% of their semi-detached dwellings in at-risk areas for residential fires. Over 40% of the terraced housing in Derby, North Lincolnshire lie within areas of elevated risk for residential fires.



## Summary for Northern Ireland

Using the 2011 Census, the HomeSafe criteria – residents over age 65 and under age 6, lone parent families, and the unemployed – was evaluated to determine the small areas within local government districts that would be at most risk for fires to occur in their home. Frequent movers was not included for Northern Ireland as this particular dataset is not collected in the census. The primary focus of the HomeSafe initiative is on detached, semi-detached and terraced dwellings. Residences that are regularly inspected through mandated annual inspections are excluded from the program. Figure 2 details the process flow to calculate the values (small area counts and sums for detached, semi-detached and terraced dwellings and population) for at risk areas and total values for the local government districts.

FIGURE 2: PROCESS FLOW FOR DATA ANALYSIS & CALCULATIONS



\*LGD = Local Government District

Based on the methodology shown above, the totals for Northern Ireland are:

- Total number of small areas is 4,537
- Total number of detached dwellings is 277,132
- Total number of semi-detached dwellings is 207,904
- Total number of terraced dwellings is 187,678
- Total population is 1,810,863
- Total number of at-risk small areas is 621
- Total number of at-risk detached dwellings is 53,956
- Total number of at-risk semi-detached dwellings is 52,286
- Total number of at-risk terraced dwellings is 46,596
- Total population in at-risk areas is 429,430
- The percentage of at-risk small areas is 13.69%
- The percentage of at-risk detached dwellings is 19.47%
- The percentage of at-risk semi-detached dwellings is 25.15%
- The percentage of at-risk terraced dwellings is 24.83%
- The percentage of at-risk population in at-risk areas is 23.71%

As the “small areas do not nest within the new 11 Local Government Districts”, a best-fit lookup table was used to map the small areas to the appropriate Local Government District (Northern Ireland Statistics and Research Agency, 2016).

Based on the methodology in Figure 2, Table 3 provides a national summary of at-risk populations in Northern Ireland. The table provides information for four main categories of interest to the fire service. First, the number of at-risk population within small areas and total population in small areas within Northern Ireland are compared to produce the percent of at-risk population. It is important to note that population includes all residents (not just those in detached, semi-detached and terraced housing). Second, the number of at-risk detached dwellings within small areas and total number of detached dwellings in small areas within Northern Ireland are compared to produce the percent of at-risk detached dwellings. Third, the number of at-risk semi-detached dwellings within small areas and total number of semi-detached dwellings in small areas within Northern Ireland are compared to produce the percent of at-risk semi-detached dwellings. Finally, the number of at-risk terraced dwellings within small areas and total number of terraced dwellings in small areas within Northern Ireland are compared to produce the percent of at-risk terraced dwellings.

**TABLE 3: NORTHERN IRELAND SUMMARY FOR AT-RISK DWELLING AND POPULATION BASED ON HOMESAFE CRITERIA**

Local Government District	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
<b>Northern Ireland Grand Total</b>	<b>429,430</b>	<b>1,810,863</b>	<b>23.71%</b>	<b>53,956</b>	<b>277,132</b>	<b>19.47%</b>	<b>52,286</b>	<b>207,904</b>	<b>25.15%</b>	<b>46,596</b>	<b>187,678</b>	<b>24.83%</b>

## Local Government District (LGD) Review

The following section contains a map of Northern Ireland showing LGD areas, small areas and small areas by LGD area at-risk. Again, the HomeSafe criteria used to identify these populations in the 2011 Census were:

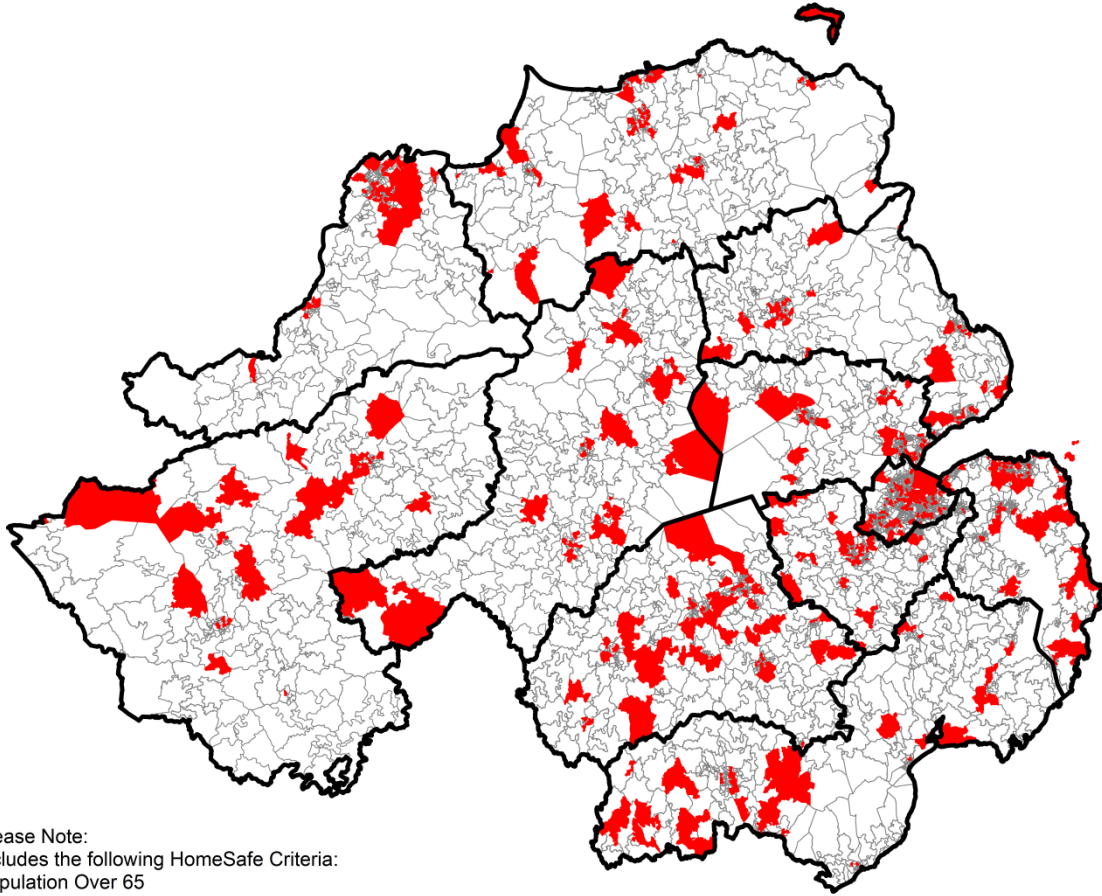
- Age Over 65;
- Age Under 6;
- Lone Parent; and
- Unemployed;

As well, a table summarizing the following information for each at-risk LGD in Northern Ireland:

- Total at-risk population in small areas for the LGD;
- Total population in small areas for the LGD;
- Percentage of at-risk population in the LGD;
- Total at-risk detached dwellings in the LGD;
- Total number of detached dwellings in the LGD;
- Percentage of at-risk detached dwellings in the LGD;
- Total at-risk semi-detached dwelling in the LGD;
- Total number of semi-detached dwellings in the LGD;
- Percentage of at-risk detached semi-dwellings in the LGD;
- Total at-risk terraced dwelling in the LGD;
- Total number of terraced dwellings in the LGD;
- Percentage of at-risk terraced dwellings in the LGD

The results presented below are intended to highlight an estimate of households and population that are at-risk for residential fires. However, a more thorough analysis using local planning data (zoning and addressing), municipal distribution of residential structure fires over a five-year period, and identification of the at-risk areas using census data would refine the at-risk properties for each particular jurisdiction.

**NORTHERN IRELAND – MAP OF AT-RISK SMALL AREAS BY LOCAL GOVERNMENT DISTRICT AREA USING HOMESAFE CRITERIA**

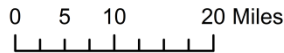


Please Note:  
 Includes the following HomeSafe Criteria:  
 Population Over 65  
 Population Under 6  
 Lone Parent Families  
 Unemployed

Excludes (data not available)  
 Mobility

Data References:  
 (Land & Property Services, 2012)  
 (Northern Ireland Statistics and Research Agency, 2011)  
 (Northern Ireland Statistics and Research Agency(1), 2011)  
 (Northern Ireland Statistics and Research Agency(2), 2011)  
 (Northern Ireland Statistics and Research Agency(3), 2011)  
 (Northern Ireland Statistics and Research Agency(4), 2011)  
 (Northern Ireland Statistics and Research Agency(5), 2011)  
 (Office for National Statistics(11), 2011)

Map Author: Sarah Hughan, GISP  
 Map Date: September 24, 2018



**Legend**

-  Local Government Districts (11)
-  At-Risk Areas (621)
-  Small Areas (4,537)

**TABLE 4: NORTHERN IRELAND –POPULATION AND DWELLING TYPE AT-RISK (BASED ON HOMESAFE CRITERIA) BY LOCAL GOVERNMENT DISTRICT (LGD)**

Local Government District	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Antrim and Newtownabbey	35,516	138,567	25.63%	4,474	19,752	22.65%	4,405	16,326	26.98%	3,589	14,310	25.08%
Ards and North Down	44,127	156,672	28.17%	5,662	25,602	22.12%	4,995	20,503	24.36%	6,165	15,355	40.15%
Armagh City, Banbridge and Craigavon	47,404	199,693	23.74%	7,482	35,240	21.23%	5,994	20,967	28.59%	4,054	19,505	20.78%
Belfast	73,178	333,871	21.92%	3,681	17,604	20.91%	8,432	44,080	19.13%	11,570	60,679	19.07%
Causeway Coast and Glens	34,758	140,877	24.67%	6,272	28,449	22.05%	4,564	16,951	26.92%	3,056	10,194	29.98%
Derry City and Strabane	42,921	147,720	29.06%	4,340	18,666	23.25%	5,798	17,592	32.96%	4,527	16,568	27.32%
Fermanagh and Omagh	24,926	113,161	22.03%	4,540	26,951	16.85%	2,835	9,296	30.50%	2,185	6,457	33.84%
Lisburn and Castlereagh	31,496	134,841	23.36%	3,995	21,244	18.81%	4,089	17,504	23.36%	2,811	11,174	25.16%
Mid and East Antrim	30,721	135,338	22.70%	4,033	23,700	17.02%	3,372	14,161	23.81%	3,738	13,826	27.04%
Mid Ulster	27,973	138,590	20.18%	4,314	27,673	15.59%	3,254	12,635	25.75%	2,052	7,887	26.02%
Newry, Mourne and Down	36,410	171,533	21.23%	5,163	32,251	16.01%	4,548	17,889	25.42%	2,849	11,723	24.30%
<b>Grand Total</b>	<b>429,430</b>	<b>1,810,863</b>	<b>23.71%</b>	<b>53,956</b>	<b>277,132</b>	<b>19.47%</b>	<b>52,286</b>	<b>207,904</b>	<b>25.15%</b>	<b>46,596</b>	<b>187,678</b>	<b>24.83%</b>

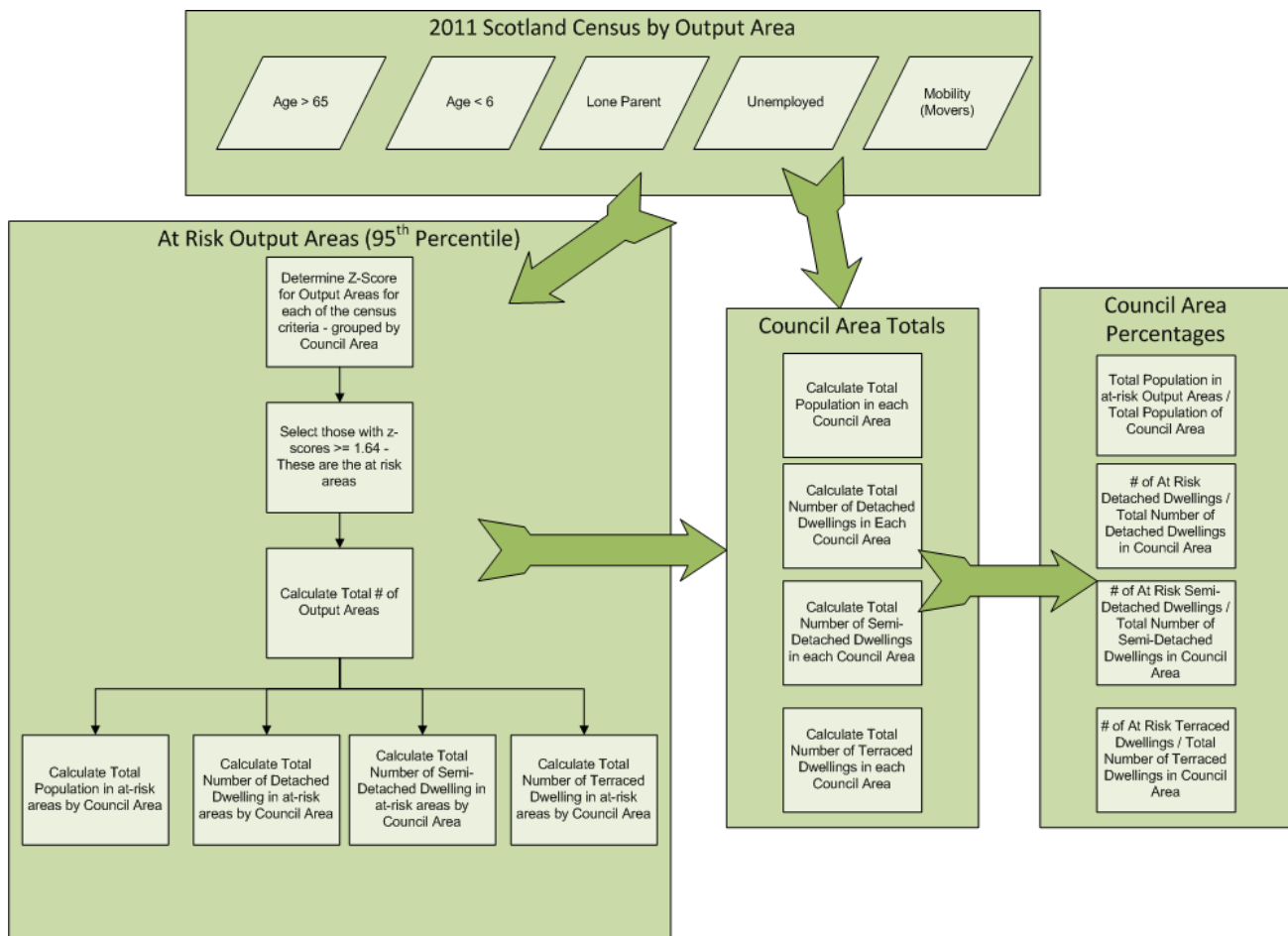
There are three local government districts in Northern Ireland where over 25% of residents reside in areas at-risk for residential fires (Antrim and Newtownabbey, Ards and North Down, and Derry City and Strabane). As compared to England and Scotland, Northern Ireland has a lower percentage of detached dwellings at-risk for residential fire. It is important to note that only four of the five HomeSafe criteria was applied to Northern Ireland. Populations that move frequently are not included, and may be a contributor to the lower percentages of detached dwellings at-risk for residential fire.

With the exception of Derry City and Strabane, and Fermanagh and Omagh, all other local government districts have less than 30% of their semi-detached dwellings in areas at-risk for residential fire. Over 40% of the terraced housing in Ards and North Down are in areas for elevated risk of residential fire; the majority are in the range of 20-30%.

## Summary for Scotland

Using the 2011 Census, the HomeSafe criteria – residents over age 65 and under age 6, lone parent families, frequent movers, and the unemployed – was evaluated to determine the output areas within council areas that would be at most risk for fires to occur in their home. The primary focus of the HomeSafe initiative is on detached, semi-detached and terraced dwellings. Residences that are regularly inspected through mandated annual inspections are excluded from the program. Figure 3 details the process flow to calculate the values (output area counts and sums for detached, semi-detached and terraced dwellings and population) for at risk areas and total values for the council areas.

**FIGURE 3: PROCESS FLOW FOR DATA ANALYSIS & CALCULATIONS**



Based on the methodology shown above, the totals for Scotland are:

- Total number of output areas is 46,351
- Total number of detached dwellings is 546,887
- Total number of semi-detached dwellings is 554,307
- Total number of terraced dwellings is 458,594
- Total population is 5,295,403

- Total number of at-risk output areas is 10,234
- Total number of at-risk detached dwellings is 126,813
- Total number of at-risk semi-detached dwellings is 128,653
- Total number of at-risk terraced dwellings is 114,276
- Total population in at-risk areas is 1,459,076
- The percentage of at-risk output areas is 22.08%
- The percentage of at-risk detached dwellings is 23.19%
- The percentage of at-risk semi-detached dwellings is 23.21%
- The percentage of at-risk terraced dwellings is 24.92%
- The percentage of at-risk population in at-risk areas is 27.55%

Based on the methodology in Figure 3, Table 5 provides a national summary of at-risk populations in Scotland. The table provides information for four main categories of interest to the fire service. First, the number of at-risk population within output areas and total population in output areas within Scotland are compared to produce the percent of at-risk population. It is important to note that population includes all residents (not just those in detached, semi-detached and terraced housing). Second, the number of at-risk detached dwellings within output areas and total number of detached dwellings in output areas within Scotland are compared to produce the percent of at-risk detached dwellings. Third, the number of at-risk semi-detached dwellings within output areas and total number of semi-detached dwellings in output areas within Scotland are compared to produce the percent of at-risk semi-detached dwellings. Finally, the number of at-risk terraced dwellings within output areas and total number of terraced dwellings in output areas within Scotland are compared to produce the percent of at-risk terraced dwellings.



**TABLE 5: SCOTLAND SUMMARY FOR AT-RISK DWELLING AND POPULATION BASED ON HOMESAFE CRITERIA**

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
<b>Scotland Grand Total</b>	1,459,076	5,295,403	27.55%	126,813	546,887	23.19%	128,653	554,307	23.21%	114,276	458,594	24.92%

## Council Area Review

The following section contains a map of Scotland showing council areas, output areas and output areas by council area at-risk. Again, the HomeSafe criteria used to identify these populations in the 2011 Census were:

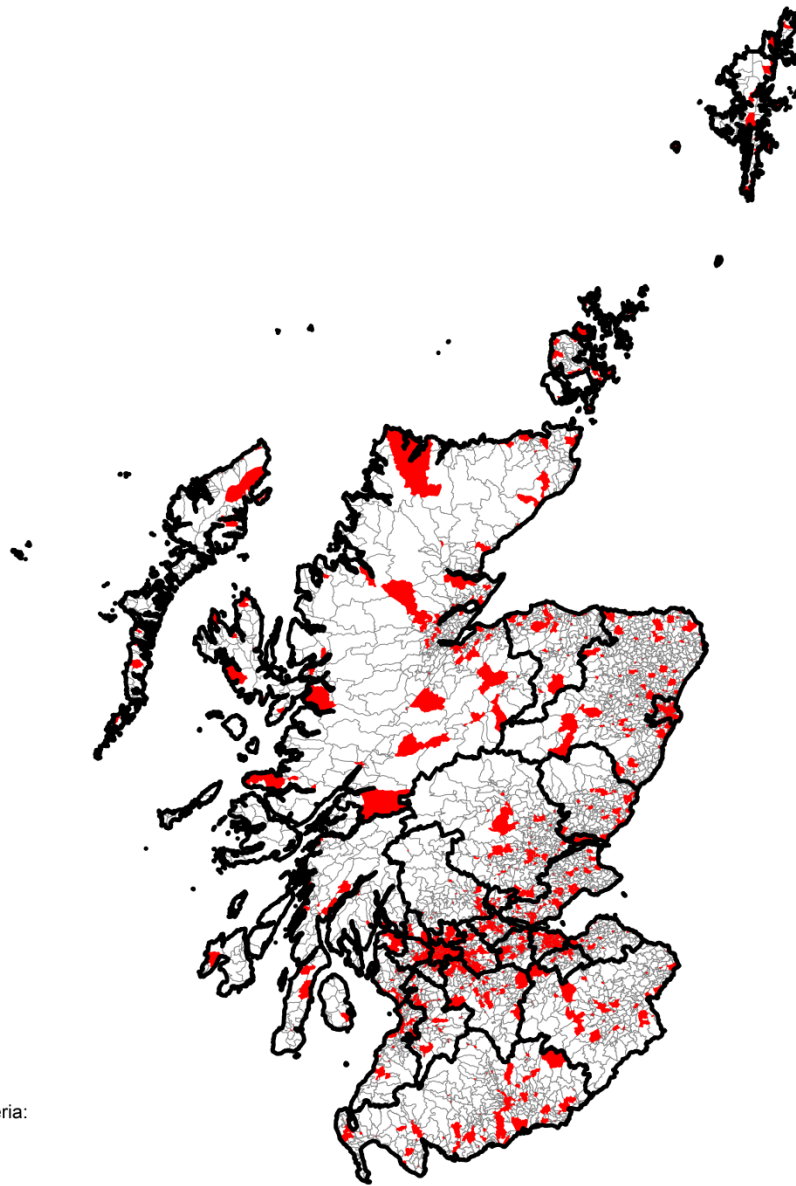
- Age Over 65;
- Age Under 6;
- Lone Parent;
- Movers (reside at current residence for less than a year);
- Unemployed;

As well, a table summarizing the following information for each at-risk council area in Scotland:

- Total at-risk population in output areas for the council area;
- Total population in output areas for the council area;
- Percentage of at-risk population that reside the council area;
- Total at-risk detached dwelling in the council area;
- Total number of detached dwellings in the council area;
- Percentage of at-risk detached dwellings in the council area;
- Total at-risk semi-detached dwelling in the council area;
- Total number of semi-detached dwellings in the council area;
- Percentage of at-risk detached semi-dwellings in the council area;
- Total at-risk terraced dwelling in the council area;
- Total number of terraced dwellings in the council area;
- Percentage of at-risk terraced dwellings in the council areas

The results presented below are intended to highlight an estimate of households and population that are at-risk for residential fires. However, a more thorough analysis using local planning data (zoning and addressing), municipal distribution of residential structure fires over a five-year period, and identification of the at-risk areas using census data would refine the at-risk properties for each particular jurisdiction.

# SCOTLAND – MAP OF AT-RISK OUTPUT AREAS BY COUNCIL AREA USING HOMESAFE CRITERIA



Please Note:  
Includes All HomeSafe Criteria:  
Population Over 65  
Population Under 6  
Lone Parent Families  
Unemployed  
Mobility

Data References:  
(National Records of Scotland(1), 2011)  
(National Records of Scotland(2), 2011)  
(National Records of Scotland(3), 2011)  
(National Records of Scotland(4), 2011)  
(National Records of Scotland(5), 2011)  
(Office for National Statistics(5), 2011)  
(Office for National Statistics(8), 2011)

Map Author: Sarah HUGHAN, GISP  
Map Date: August 21, 2018

0 25 50 100 Miles



## Legend


-  Council Areas (32)
-  At-Risk Areas (10,234)
-  2011 Output Areas (46,351)

TABLE 6: SCOTLAND -POPULATION AND DWELLING TYPE AT-RISK (BASED ON HOMESAFE CRITERIA) BY COUNCIL AREA

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Aberdeen City	60,591	222,793	27.20%	2,685	12,091	22.21%	4,785	21,843	21.91%	3,330	16,998	19.59%
Aberdeenshire	74,032	252,973	29.26%	11,736	51,711	22.70%	8,871	31,328	28.32%	4,644	12,989	35.75%
Angus	30,991	115,978	26.72%	3,495	17,674	19.77%	2,790	12,820	21.76%	2,071	9,649	21.46%
Argyll and Bute	24,585	88,166	27.88%	2,893	16,924	17.09%	2,497	9,297	26.86%	1,980	5,791	34.19%
City of Edinburgh	128,578	476,626	26.98%	5,806	23,895	24.30%	7,165	29,395	24.37%	6,457	29,346	22.00%
Clackmannanshire	15,170	51,442	29.49%	1,550	5,727	27.06%	1,684	6,382	26.39%	1,541	5,210	29.58%
Dumfries and Galloway	40,602	151,324	26.83%	5,283	26,267	20.11%	4,892	20,789	23.53%	3,964	15,137	26.19%
Dundee City	44,790	147,268	30.41%	2,311	8,261	27.97%	4,839	18,226	26.55%	2,179	8,623	25.27%
East Ayrshire	30,478	122,767	24.83%	2,715	11,938	22.74%	4,013	17,060	23.52%	2,883	12,939	22.28%
East Dunbartonshire	24,261	105,026	23.10%	2,376	13,542	17.55%	2,733	15,345	17.81%	1,726	6,451	26.76%
East Lothian	27,435	99,717	27.51%	2,745	10,260	26.75%	2,487	12,225	20.34%	2,339	10,359	22.58%
East Renfrewshire	22,355	90,574	24.68%	1,808	10,584	17.08%	2,358	11,781	20.02%	1,777	6,406	27.74%
Falkirk	44,782	155,990	28.71%	4,545	14,798	30.71%	3,841	18,493	20.77%	3,775	15,665	24.10%
Fife	101,548	365,198	27.81%	10,226	40,182	25.45%	9,552	42,707	22.37%	9,502	41,045	23.15%
Glasgow City	158,991	593,245	26.80%	3,771	11,400	33.08%	9,205	37,096	24.81%	8,309	33,999	24.44%
Highland	59,620	232,132	25.68%	9,243	48,796	18.94%	6,926	30,416	22.77%	5,175	16,993	30.45%
Inverclyde	24,212	81,485	29.71%	1,329	4,751	27.97%	2,340	8,345	28.04%	1,821	6,496	28.03%
Midlothian	22,649	83,187	27.23%	1,778	6,985	25.45%	2,284	10,480	21.79%	2,176	10,309	21.11%
Moray	24,411	93,295	26.17%	2,709	15,741	17.21%	3,127	13,135	23.81%	2,172	7,755	28.01%
Na h-Eileanan an Iar	8,020	27,684	28.97%	2,144	9,320	23.00%	834	2,520	33.10%	444	1,118	39.71%
North Ayrshire	36,422	138,146	26.36%	3,142	13,987	22.46%	3,284	15,583	21.07%	5,005	18,344	27.28%
North Lanarkshire	105,342	337,727	31.19%	8,133	24,009	33.87%	8,343	34,383	24.26%	11,079	42,311	26.18%
Orkney Islands	6,548	21,349	30.67%	1,400	6,289	22.26%	1,017	2,422	41.99%	380	860	44.19%
Perth and Kinross	42,783	146,652	29.17%	5,600	26,881	20.83%	3,484	15,208	22.91%	2,429	9,136	26.59%

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Renfrewshire	45,227	174,908	25.86%	2,228	12,329	18.07%	3,317	17,823	18.61%	3,586	17,576	20.40%
Scottish Borders	31,005	113,870	27.23%	3,890	17,298	22.49%	3,261	13,512	24.13%	2,557	10,557	24.22%
Shetland Islands	7,431	23,167	32.08%	1,667	6,019	27.70%	833	2,760	30.18%	375	811	46.24%
South Ayrshire	31,689	112,799	28.09%	3,006	14,313	21.00%	2,917	14,054	20.76%	2,858	10,748	26.59%
South Lanarkshire	84,080	313,830	26.79%	8,382	30,395	27.58%	6,988	31,944	21.88%	8,155	37,278	21.88%
Stirling	25,794	90,247	28.58%	2,947	12,537	23.51%	2,251	9,761	23.06%	1,705	6,385	26.70%
West Dunbartonshire	25,801	90,720	28.44%	729	3,925	18.57%	1,915	9,140	20.95%	2,219	8,692	25.53%
West Lothian	48,853	175,118	27.90%	4,541	18,058	25.15%	3,820	18,034	21.18%	5,663	22,618	25.04%
<b>Grand Total</b>	<b>1,459,076</b>	<b>5,295,403</b>	<b>27.55%</b>	<b>126,813</b>	<b>546,887</b>	<b>23.19%</b>	<b>128,653</b>	<b>554,307</b>	<b>23.21%</b>	<b>114,276</b>	<b>458,594</b>	<b>24.92%</b>

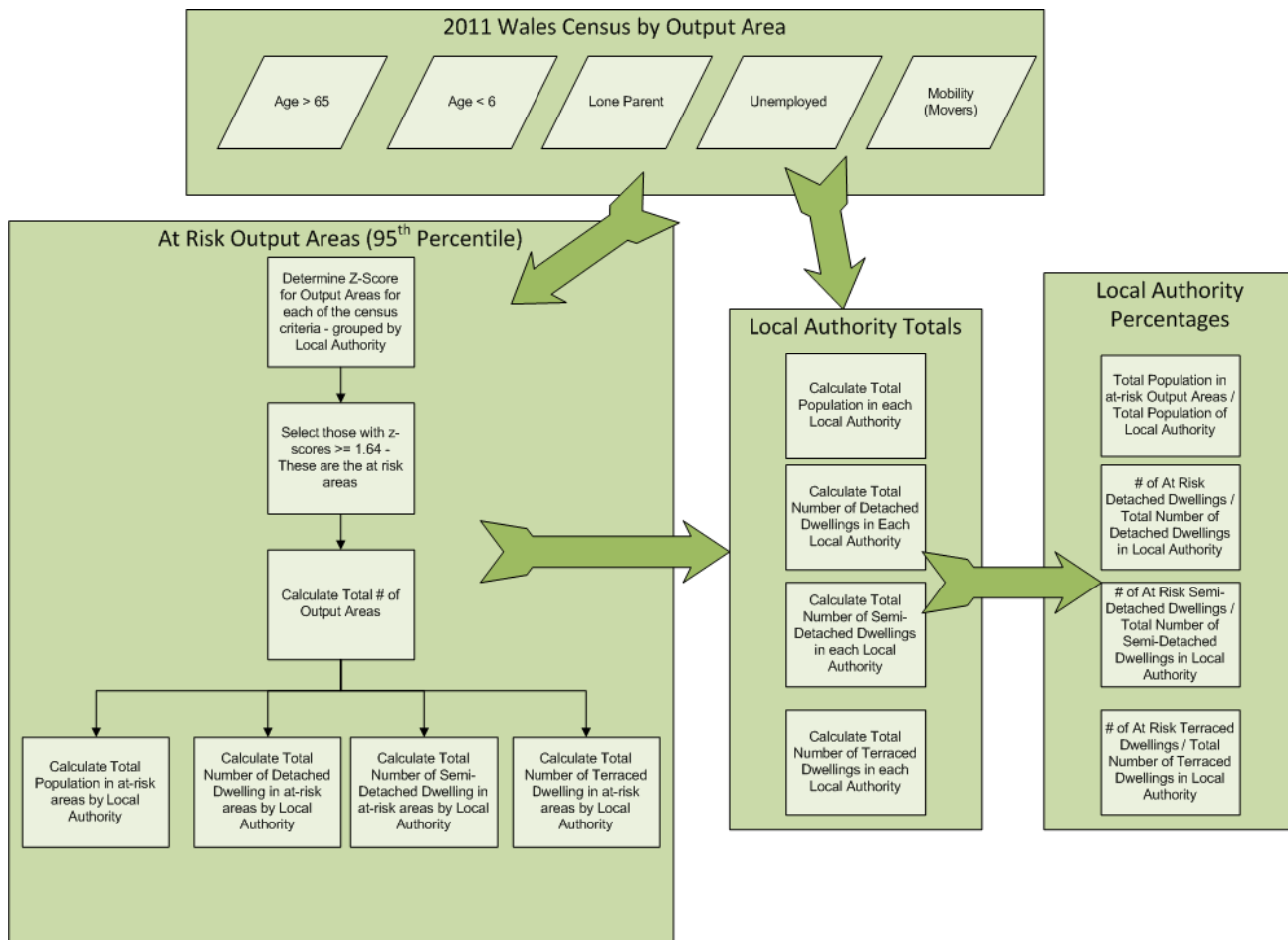
There are four council areas within Scotland (Dundee City, North Lanarkshire, Orkney Islands, and Shetland Islands) where over 30% of residents reside in areas at-risk for residential fires. With the exception of Falkirk, Glasgow City, and North Lanarkshire, all other council areas have less than 30% of their detached dwellings in areas at-risk for residential fire.

With the exception of Orkney Islands, Na h-Eileanan an Iar, and Shetlands Islands all other council areas have less than 30% of their semi-detached dwellings in areas at-risk for residential fire. Over 40% of the terraced housing in Orkney Islands and Shetlands are in areas for elevated risk of residential fire; the majority are in the range of 20-30%.

## Summary for Wales

Using the 2011 Census, the HomeSafe criteria – residents over age 65 and under age 6, lone parent families, frequent movers, and the unemployed – was evaluated to determine the output areas within local authority areas that would be at most risk for fires to occur in their home. The primary focus of the HomeSafe initiative is on detached, semi-detached and terraced dwellings. Residences that are regularly inspected through mandated annual inspections are excluded from the program. Figure 4 details the process flow to calculate the values (output area counts and sums for detached, semi-detached and terraced dwellings and population) for at risk areas and total values for the local authority areas.

**FIGURE 4: PROCESS FLOW FOR DATA ANALYSIS & CALCULATIONS**



Based on the methodology shown above, the totals for Wales are:

- Total number of output areas is 10,036
- Total number of detached dwellings is 383,737
- Total number of semi-detached dwellings is 429,955
- Total number of terraced dwellings is 385,379

- Total population is 3,036,456
- Total number of at-risk output areas is 2,250
- Total number of at-risk detached dwellings is 79,975
- Total number of at-risk semi-detached dwellings is 100,215
- Total number of at-risk terraced dwellings is 98,484
- Total population in at-risk areas is 793,176
- The percentage of at-risk output areas is 22.42%
- The percentage of at-risk detached dwellings is 20.84%
- The percentage of at-risk semi-detached dwellings is 23.31%
- The percentage of at-risk terraced dwellings is 25.56%
- The percentage of at-risk population in at-risk areas is 25.89%

Output areas are used as “they are the lowest level of geography across census topics, and the average population in Wales output areas was 309 people” (Office for National Statistics(12), 2011).

Based on the methodology in Figure 4, Table 7 provides a national summary of at-risk populations in Wales. The table provides information for four main categories of interest to the fire service. First, the number of at-risk population within output areas and total population in output areas within Wales are compared to produce the percent of at-risk population. It is important to note that population includes all residents (not just those in detached, semi-detached and terraced housing). Second, the number of at-risk detached dwellings within output areas and total number of detached dwellings in output areas within Wales are compared to produce the percent of at-risk detached dwellings. Third, the number of at-risk semi-detached dwellings within output areas and total number of semi-detached dwellings in output areas within Wales are compared to produce the percent of at-risk semi-detached dwellings. Finally, the number of at-risk terraced dwellings within output areas and total number of terraced dwellings in output areas within Wales are compared to produce the percent of at-risk terraced dwellings.

**TABLE 7: WALES SUMMARY FOR AT-RISK DWELLING AND POPULATION BASED ON HOMESAFE CRITERIA**

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
<b>Wales Grand Total</b>	793,176	3,063,456	25.89%	79,975	383,737	20.84%	100,215	429,955	23.31%	98,484	385,379	25.56%



## Local Authority Area Review

The following section contains a map of Wales showing local authority areas, output areas and output areas by local authority area at-risk. Again, the HomeSafe criteria used to identify these populations in the 2011 Census were:

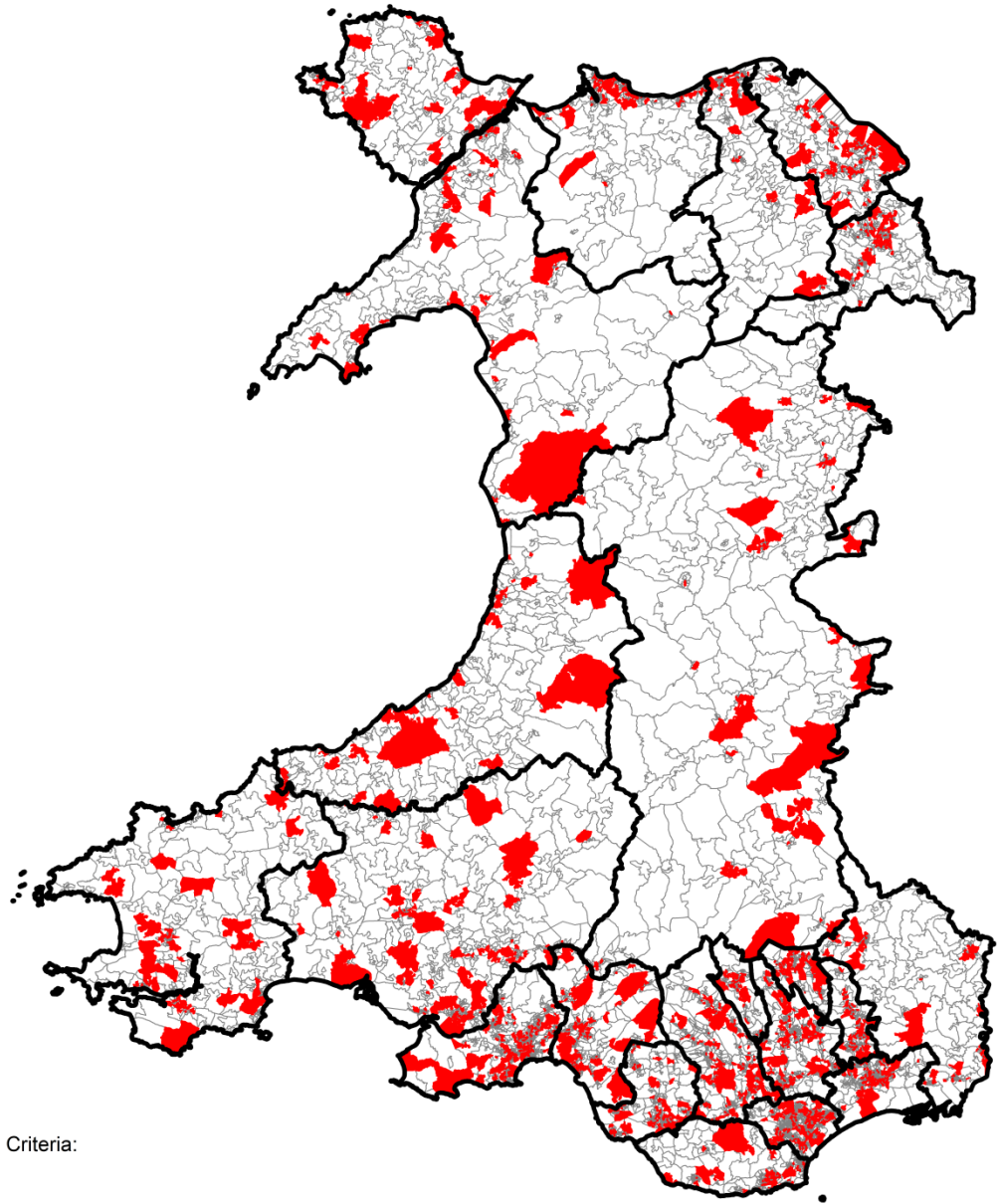
- Age Over 65;
- Age Under 6;
- Lone Parent;
- Movers (reside at current residence for less than a year);
- Unemployed; and

As well, a table summarizing the following information for each at-risk local authority area in Wales:

- Total at-risk population in output areas for the local authority area;
- Total population in output areas for the local authority area;
- Percentage of at-risk population that reside in the local authority area;
- Total at-risk detached dwelling in the local authority area;
- Total number of detached dwellings in the local authority area;
- Percentage of at-risk detached dwellings in the local authority area;
- Total at-risk semi-detached dwelling the local authority area;
- Total number of semi-detached dwellings in the local authority area;
- Percentage of at-risk detached semi-dwellings in the local authority area;
- Total at-risk terraced dwelling in the local authority area;
- Total number of terraced dwellings in the local authority area;
- Percentage of at-risk terraced dwellings in the local authority area

The results presented below are intended to highlight an estimate of households and population that are at-risk for residential fires. However, a more thorough analysis using local planning data (zoning and addressing), municipal distribution of residential structure fires over a five-year period, and identification of the at-risk areas using census data would refine the at-risk properties for each particular jurisdiction.

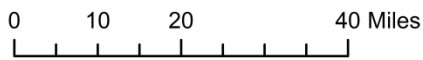
**WALES – MAP OF AT-RISK OUTPUT AREAS BY LOCAL AUTHORITY AREA USING HOMESAFE CRITERIA**






Please Note:  
Includes All HomeSafe Criteria:  
Population Over 65  
Population Under 6  
Lone Parent Families  
Unemployed  
Mobility

Data References:  
(Office for National Statistics, 2011)  
(Office for National Statistics(1), 2011)  
(Office for National Statistics(2), 2011)  
(Office for National Statistics(3), 2011)  
(Office for National Statistics(4), 2011)  
(Office for National Statistics(5), 2011)  
(Office for National Statistics(7), 2011)  
(Office for National Statistics(9),2011)

Map Author: Sarah Hughan, GISP  
Map Date: Sept 24, 2018



**Legend**

-  Local Authority (22)
-  At-Risk Areas (2,250)
-  2011 Output Areas (10,036)

**TABLE 8: WALES –POPULATION AND DWELLING TYPE AT-RISK (BASED ON HOMESAFE CRITERIA) BY LOCAL AUTHORITY AREA**

Council Area	Population			Detached Dwellings			Semi-Detached Dwellings			Terraced Dwellings		
	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk	At-Risk	Total	Percent At-Risk
Blaenau Gwent	15,758	69,814	22.57%	826	3,506	23.56%	1,943	8,517	22.81%	3,443	16,669	20.66%
Bridgend	33,046	139,178	23.74%	3,825	14,346	26.66%	4,722	23,669	19.95%	3,136	16,452	19.06%
Caerphilly	40,445	178,806	22.62%	3,270	12,455	26.25%	5,594	30,270	18.48%	6,240	27,852	22.40%
Cardiff	104,494	346,090	30.19%	5,156	20,106	25.64%	11,053	42,790	25.83%	12,013	45,102	26.64%
Carmarthenshire	44,922	183,777	24.44%	6,396	32,684	19.57%	6,314	27,879	22.65%	4,821	16,761	28.76%
Ceredigion	22,289	75,922	29.36%	3,482	17,046	20.43%	2,378	7,685	30.94%	1,560	5,278	29.56%
Conwy	29,812	115,228	25.87%	3,331	19,849	16.78%	3,753	17,191	21.83%	2,346	8,157	28.76%
Denbighshire	21,566	93,734	23.01%	3,013	18,786	16.04%	2,889	13,175	21.93%	1,835	5,689	32.26%
Flintshire	43,775	152,506	28.70%	5,503	24,660	22.32%	7,723	27,054	28.55%	3,389	9,285	36.50%
Gwynedd	30,037	121,874	24.65%	4,208	21,308	19.75%	3,075	14,013	21.94%	4,198	18,920	22.19%
Isle of Anglesey	18,327	69,751	26.27%	3,204	16,382	19.56%	1,649	7,281	22.65%	2,580	7,620	33.86%
Merthyr Tydfil	14,479	58,802	24.62%	1,142	4,013	28.46%	2,053	7,257	28.29%	2,387	13,185	18.10%
Monmouthshire	22,378	91,323	24.50%	3,290	17,638	18.65%	2,752	11,354	24.24%	1,946	6,789	28.66%
Neath Port Talbot	37,945	139,812	27.14%	3,498	12,698	27.55%	6,396	27,189	23.52%	4,836	17,235	28.06%
Newport	34,667	145,736	23.79%	2,017	11,830	17.05%	3,210	19,371	16.57%	5,630	21,091	26.69%
Pembrokeshire	28,851	122,439	23.56%	4,511	25,251	17.86%	3,651	15,846	23.04%	2,660	11,716	22.70%
Powys	33,781	132,976	25.40%	4,961	30,377	16.33%	3,866	15,523	24.90%	4,219	11,401	37.01%
Rhondda Cynon Taf	58,747	234,410	25.06%	4,568	15,271	29.91%	7,752	27,956	27.73%	10,029	53,075	18.90%
Swansea	69,321	239,023	29.00%	6,414	25,318	25.33%	8,576	36,311	23.62%	8,630	28,730	30.04%
The Vale of Glamorgan	30,681	126,336	24.29%	2,279	14,842	15.36%	3,469	17,045	20.35%	4,407	14,976	29.43%
Torfaen	24,953	91,075	27.40%	2,141	7,168	29.87%	2,843	10,806	26.31%	4,105	17,246	23.80%
Wrexham	32,902	134,844	24.40%	2,940	18,203	16.15%	4,554	21,773	20.92%	4,074	12,150	33.53%
<b>Grand Total</b>	<b>793,176</b>	<b>3,063,456</b>	<b>25.89%</b>	<b>79,975</b>	<b>383,737</b>	<b>20.84%</b>	<b>100,215</b>	<b>429,955</b>	<b>23.31%</b>	<b>98,484</b>	<b>385,379</b>	<b>25.56%</b>

With the exception of Cardiff, all other local authority areas within Wales have less than 30% of their population living in areas of elevated risk for residential fires. All local authority areas have less than 30% of their detached dwelling units in areas at-risk for residential fire; however, 36% of local authority areas fall within the 25%-29.9% range of detached dwellings in areas of elevated risk for residential fires. With the exception of Ceredigion, all other local authority areas have less than 30% of their semi-detached dwellings in areas deemed at higher risk for residential fires. Denbighshire, Flintshire, Isle of Anglesey, Powys, Swansea, and Wrexham all have over 30% of their terraced dwellings in areas of elevated risk for residential fires.

## Conclusion

The analyses conducted for this report substantiate the importance of examining fire trends at a local level. It is estimated that within the United Kingdom there are roughly 1.2 million detached dwellings, 1.8 million semi-detached dwellings and 1.8 million terraced dwellings that are at-risk of having a fire in their home. Having firefighters to go door to door promoting fire risk reduction and safety, as well as smoke alarm testing and installation has been a proven method in Surrey, BC. However, it is essential that fire services examine their local fire trends at community levels before undertaking public education and/or smoke alarm distribution campaigns. The research discussed in this report identified the relative risk levels of communities across the United Kingdom; however, it is important that fire services not only conduct the HomeSafe analysis at a localized level but also take the added step of overlaying their recent historical residential fire data when considering where to focus their resources in order to maximize returns. Fires will happen, but the overall mandate to reduce residential fires and fire-related casualties will be reached more quickly and efficiently by using localized data-driven approaches.

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