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The Current Trends and Challenging Situations of Fire Incident Statistics

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ABSTRACT: Fire incidents have never stopped from their occurrence in our routine life, and there is no institution or situation which is immune from fire. These cases kill and injure thousands of people every year, beside the great damage and loss. In this review, the data and statistics from various agencies were obtained and studied. The general overview of the current statistics in Malaysia and some other countries and their ways of reporting the fire statistics were evaluated. The challenge and obstacle faced during the gathering of data statistics on fire breakouts are discussed. A generalised fire statistics involving all the countries worldwide is known to provide benefit to the society but it needs the participations, contributions and efforts from all members of the world, regardless of their political, economical and social status. The information from this review could be used by the Fire and Rescue Department of Malaysia to counteract the situation of fire cases in Malaysia through the establishment of appropriate intervention and prevention steps.

Keywords: world statistics, fire, trends, challenges, Malaysia

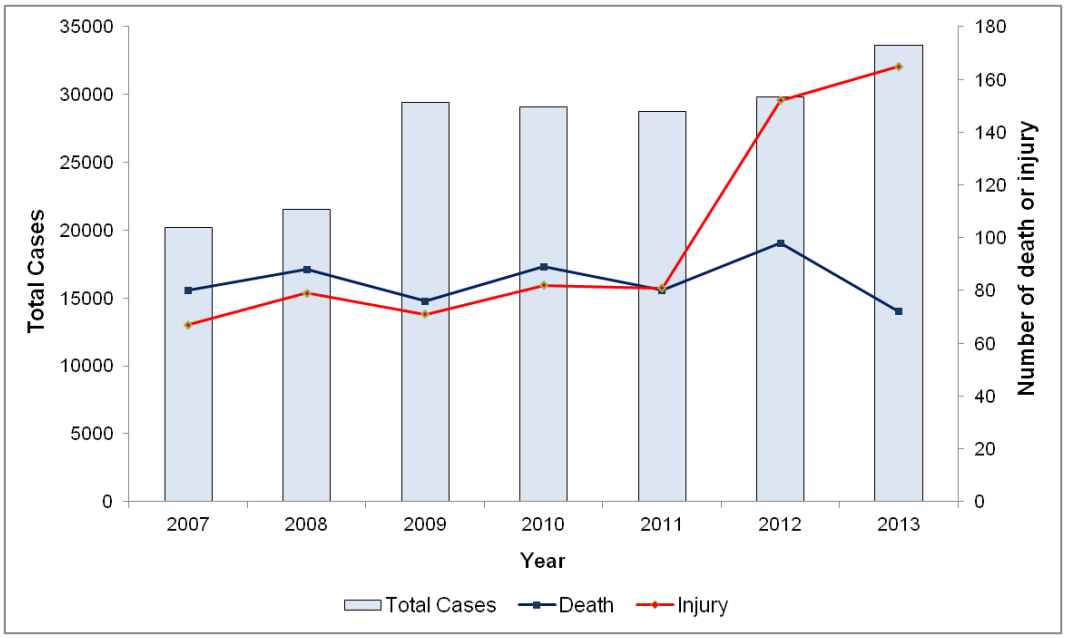
Introduction

Fire plays a vital role in the evolution of human history from the ancient usage as a weapon to protect man from wild animal to improve land fertilizer and food preparation. It can also bring destructive disasters that lead to fatalities and injuries as well as great losses of property and damage of environmental elements [1-2]. From chemistry point of view, fire is an oxidation reaction with liberation of energy. The advancement of modern science enables us to understand the chemistry of fire, and also applies it to various contexts for the benefits of human beings. At the same time, the knowledge of fire has also led us to understand the cause of fire, to know the conditions in which fire could occur, and investigate any incident dealing with fire cases. Over the years, the frequency of fire occurrence have been documented and these information are useful for fire prevention, infrastructure planning and law enforcement.

This paper studies the data of fire incidents from various agencies, both governmental and private parties from Malaysia and abroad. The current statistics on fire breakout, injury and fatality were obtained from the online sources and published reports were discussed. The consistency on data presentation and the way of reporting from a number of countries was also evaluated.

Fire Statistics in Malaysia

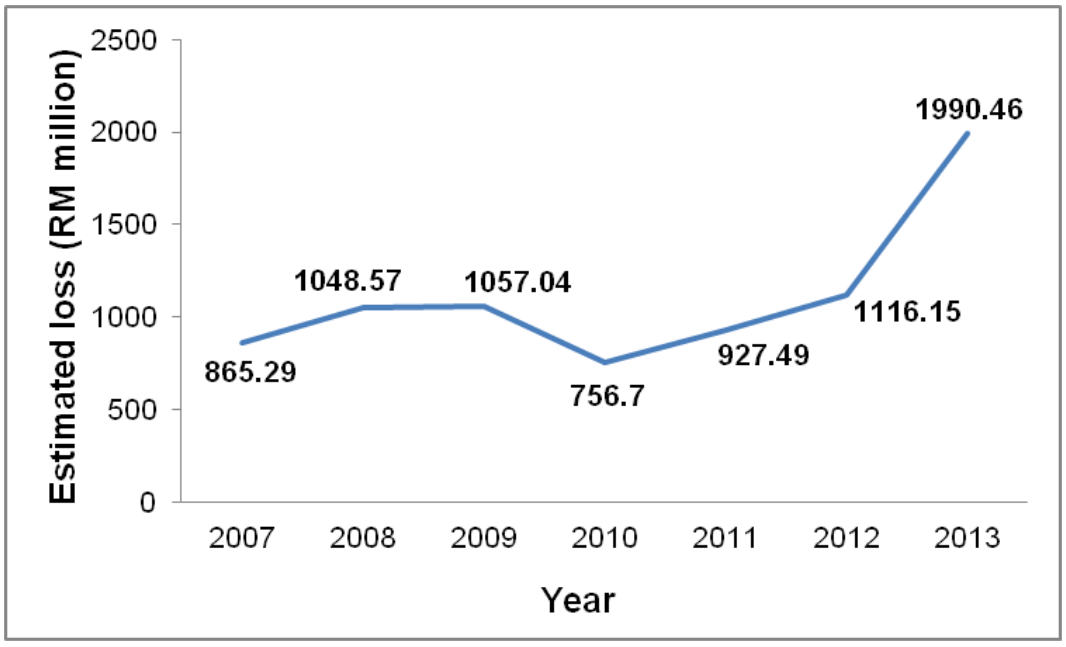
Fire and Rescue Department of Malaysia (FRDM) attended to 33,640 fires in 2013 over the country or an average of 92 cases per day. This figure was the highest annual figure recorded, continuing the generally upward trend since 2007 [2], Fig. 1. Compared to 29848 fires in 2012, there was an 11% increase with the statistics remains stable from 2009 to 2012 [3]. A sharp increase of fire incidents in 2012 had killed 72 civilians but this was the lowest number of fatalities for the last seven years [2]. Note that the death statistics referred to instant death at the place of occurrence and the actual number of death as a result of fire is undoubtedly higher. Generally, the death statistics due to fire outbreaks are stable although the incident of these cases were more frequent occurred. Also, 165 and 152 injuries were sustained in fire in 2013 and 2012, respectively, doubling the total injuries due to fire in 2011. While considering 2013 alone, these figures account only 0.21% and 0.49% of death and injuries, respectively, from the total fire cases reported [2-3]. In other words, two civilian was killed and five were injuries in every thousand cases. Therefore, these figures are deemed significant as fire investigation as well as the safety and prevention steps should be implemented in the country.



(Source: FDRM, 2014)

Fig. 1: Statistics on fire breakouts in Malaysia, 2007-2013

In terms of property loss, millions of dollars was burned due to fire breakouts, as illustrated in Fig. 2. The 33640 cases in 2013 cost nearly 20 billion Malaysia Ringgit (ca. USD 6 billion), an increase of RM 874.31 million or USD 264 million (78.3%) from RM 1116.15 million (USD 338 million) in 2012 [2-3] and was the highest estimated loss in seven years 2012 [2].



(Source: FDRM, 2014)

Fig. 2: Estimated loss (RM million) due to fire breakouts. (Note: 1RM≈0.3USD)

As a country located in the equatorial region, Malaysia is experiencing a tropical rainforest climate. With approximately 58.2% of its land covered by forest [3], plantation or forest fires were common, and have contributed to 40.3% of the total cases reported in 2013 [2-3]. Figure 3 illustrates the number of fire breakouts in Malaysia by types. High occurrence of these fires could be due to the hot climate with natural occurrence in shaping ecosystems, but could also due to human activities such as in traditional farming.

At the time of writing, Malaysia was experiencing the worst ever air pollution due to forest fire. These fires have lead to the massive damage of ecosystems, such as destroying the habitats of wildlife and even their lives, eradicating the timber and natural resources and also polluting the air with the harmful emissions to human health [1,4].

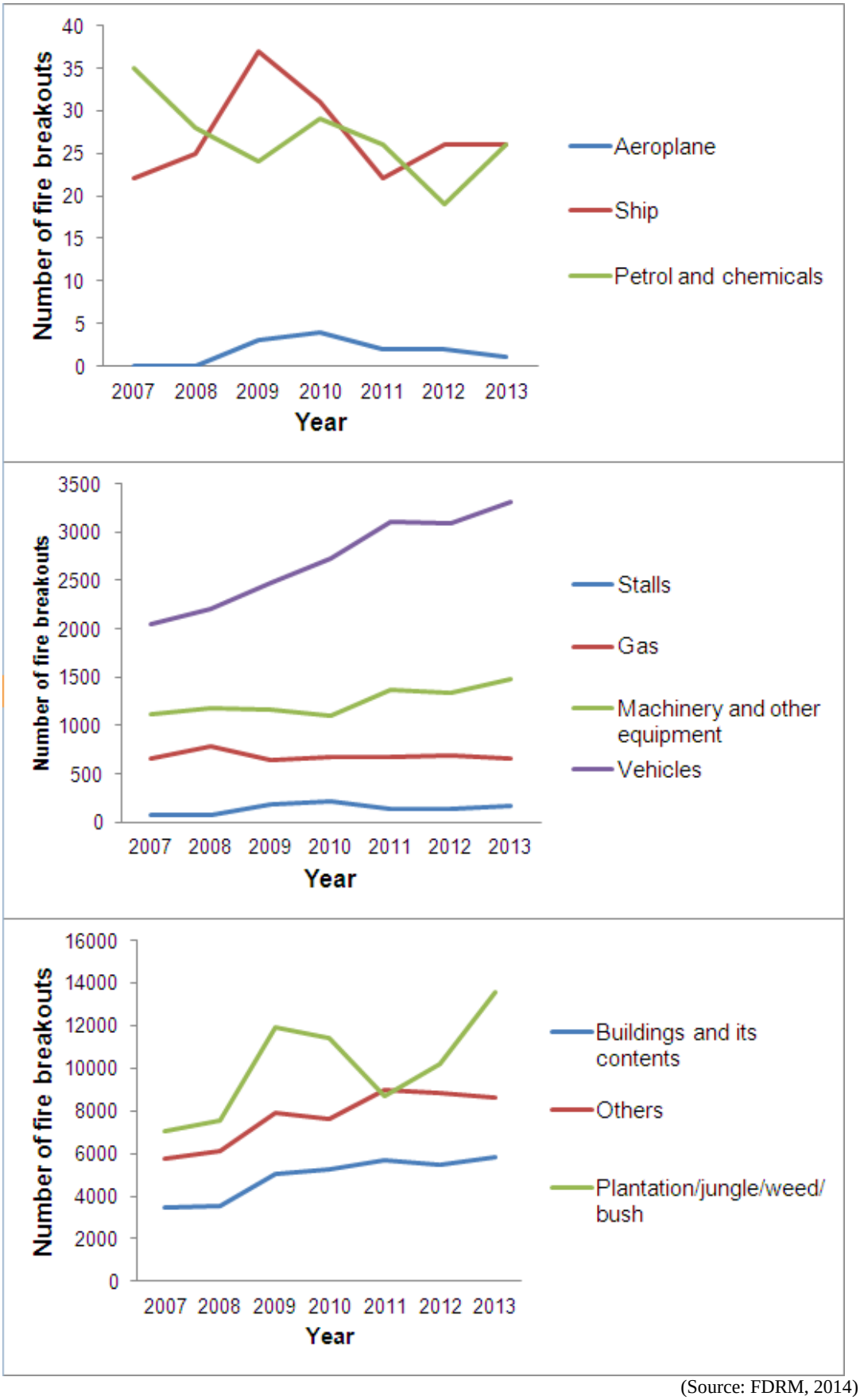
Structure fires has also increased slightly (6.8%) from 5447 in 2012 to 5817 in 2013 [2-3]. Structure fire cases often cause the greatest loss of money and property, both directly and indirectly. In 2013, structure fire cases involved electrical fires (16.1%) and unattended cooking (6.7%) [2-3,5]. It is worth noting that there are two categories denoted as "others" and "unknown" which comprised the majorities of structure fires, with 57.4% and 11.6%, respectively [2-3,5]. From year 2007 to 2012, electrical fires in building or its content continued to be one of the main causes in these cases.

Fig. 3 also showed that vehicle fire increased by 221 cases (7.1%) in 2013 as compared to the year before [2-3,5]. These fires are attributed to motor car, motorcycle, lorry, bus and other transportation. In general, a vehicle fire may start small but can be very dangerous due to the presence of flammables such petrol, diesel and lubricants as well as the load carried. Fires on machinery and equipments, and also those occurred in stalls increased by 143 cases (10.7%) and 25 cases (17.6%), respectively. On the other hand, fires due to gas dropped by 26 cases (3.8%) from 692 cases in 2012 to 666 cases in 2013. In general, fire of aeroplane, ships as well as petrol and chemicals remained the minor composition in the fire statistics of Malaysia [5].

Malaysia fire statistics also recorded the sources leading to fire breakouts. Most causes have shown downward trends since 2010, except the peak indicating "others" spiked high in the graph, Fig. 4. "Others" were the fires which could not include in any of the source groups, contributing to 50.9% of total cases [2-3,5]. However, the examples of fires which belonged to this group were not mentioned in the released reports, and this condition should be noted by government agencies in order to produce a clearer view of fire statistics in Malaysia. Moreover, the high number of fires that grouped in "others" has alarmed these agencies to respond to these cases, and search for the solutions to overcome the situations.

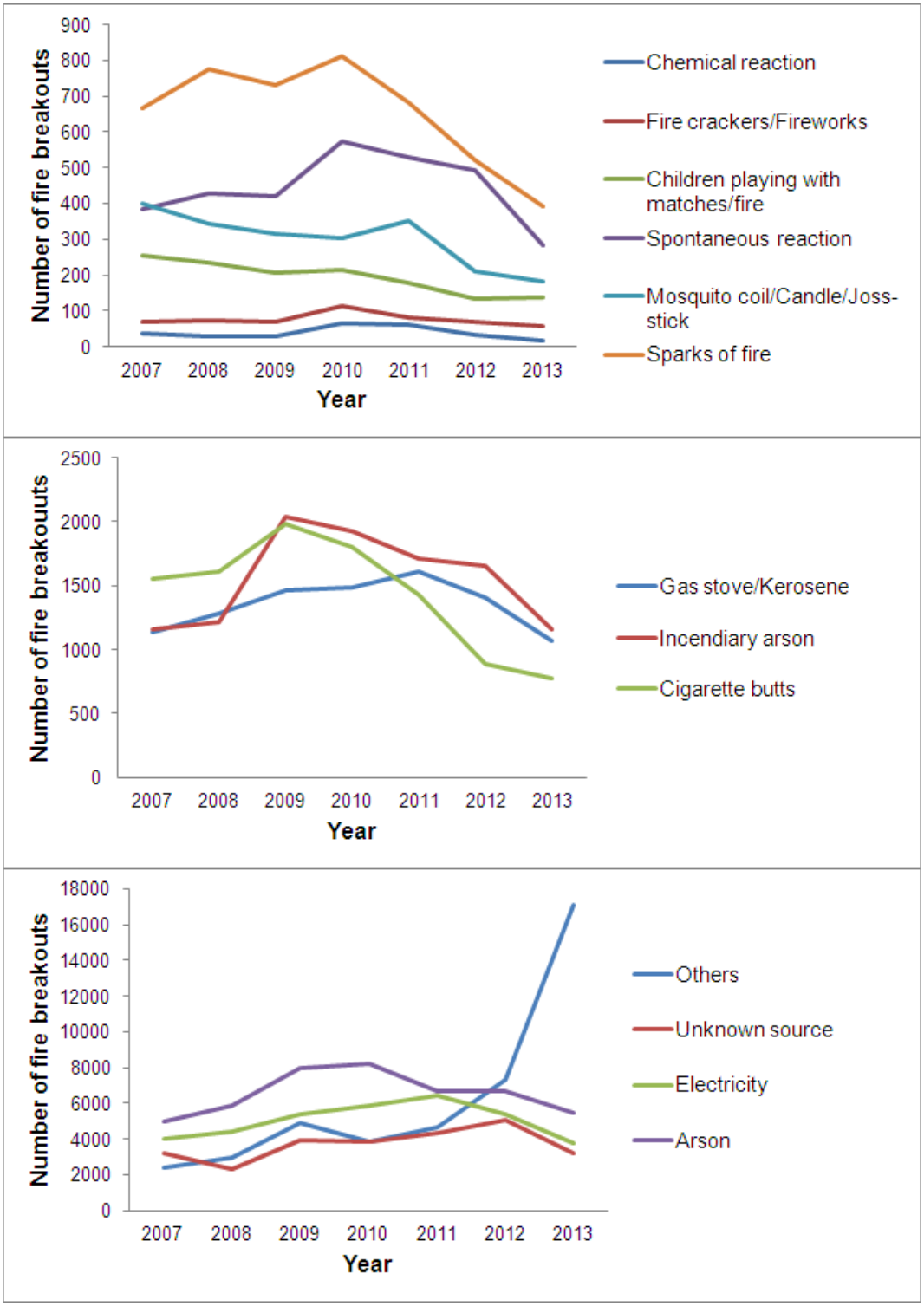
Excluding "others", arson was the highest contributing cause of fire. It has contributed to 16.3% or 5482 out of the total 33640 fires in 2013 [2]. Although the fire cases due to arson decreased since 2010, they remained the highest contributing cause of fires for the last seven years. The statistics showed two types of arson, with one named as arson and another as incendiary arson.

Arson referred to those act with ignited a fire without a bad intention. On the other hand, incendiary arson caused fires referred to those incidents due to the criminal act of deliberately setting fire a property [4]. These cases must be taken seriously as they were mostly related to crime and threatened the public safety. Electrical fires and unknown source completed the top three highest numbers of fires after arson. Electrical fires decreased by 1580 cases (29.4%) [2-3,5]. In fact, electrical fires dropped to a seven-year low in 2013. Despite the drop, it still continued to form the largest component of fire cases, especially in structure fires. As mentioned previously, 934 cases of the total 5817 structure fires were due to electrical sources [3]. These fires pose a serious threat to the residents and could cause significant damage to property. For the cases of unknown, more investigative efforts are certainly needed to gain useful information to develop precautionary strategies in Malaysia.



(Source: FDRM, 2014)

Fig. 3: Number of fire breakouts in Malaysia by type, 2007-2013



(Source: FDRM, 2014)

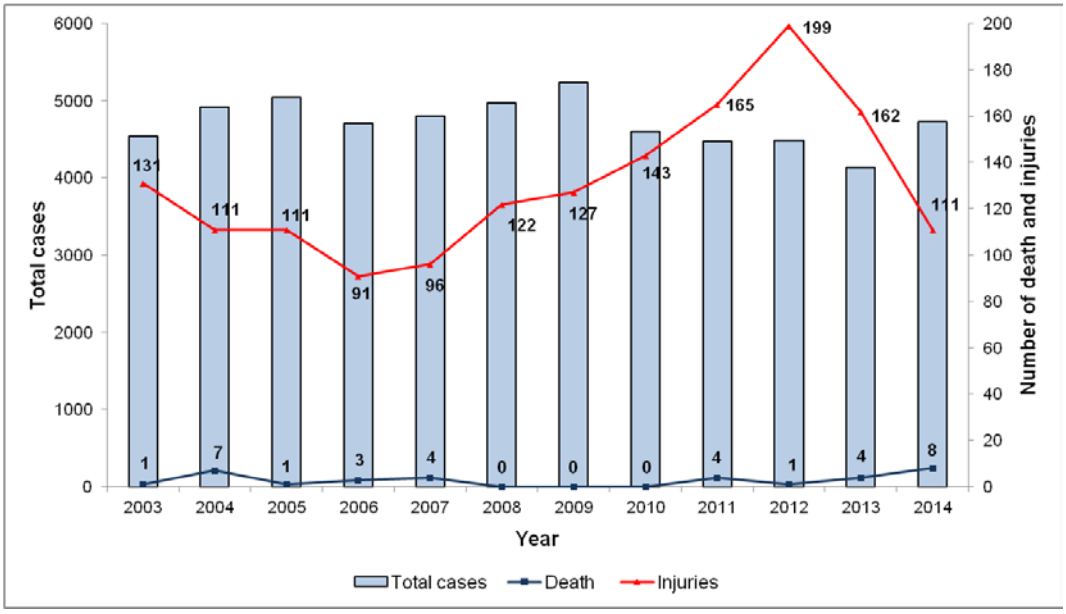
Fig. 4: Number of fire breakouts in Malaysia by source, 2007-2013

Fire Statistics in Singapore

Singapore is a city state of similar climate but a more advanced land use as compared to Malaysia. Singapore Civil Defense Force (SCDF) maintains its annually statistics on fire, ambulance and enforcement [7]. Fig. 5 illustrates its fire statistics from 2003 to 2014.

A total of 4724 fires were responded by SCDF in 2014, an average of 13 cases a day over the country [7]. The figure increased by 588 cases

(14.2%) from 4136 cases in 2013. It is worth noting that year 2013 was the lowest annual fire recorded in the twelve years period from 2003 to 2014. The increase of total cases was largely due to the significant spike in vegetation fires, especially during the extended dry period from January to March 2014 [7].



(Source: SCDF, 2014)

Fig. 5: Statistics on fire breakouts in Singapore, 2003-2014

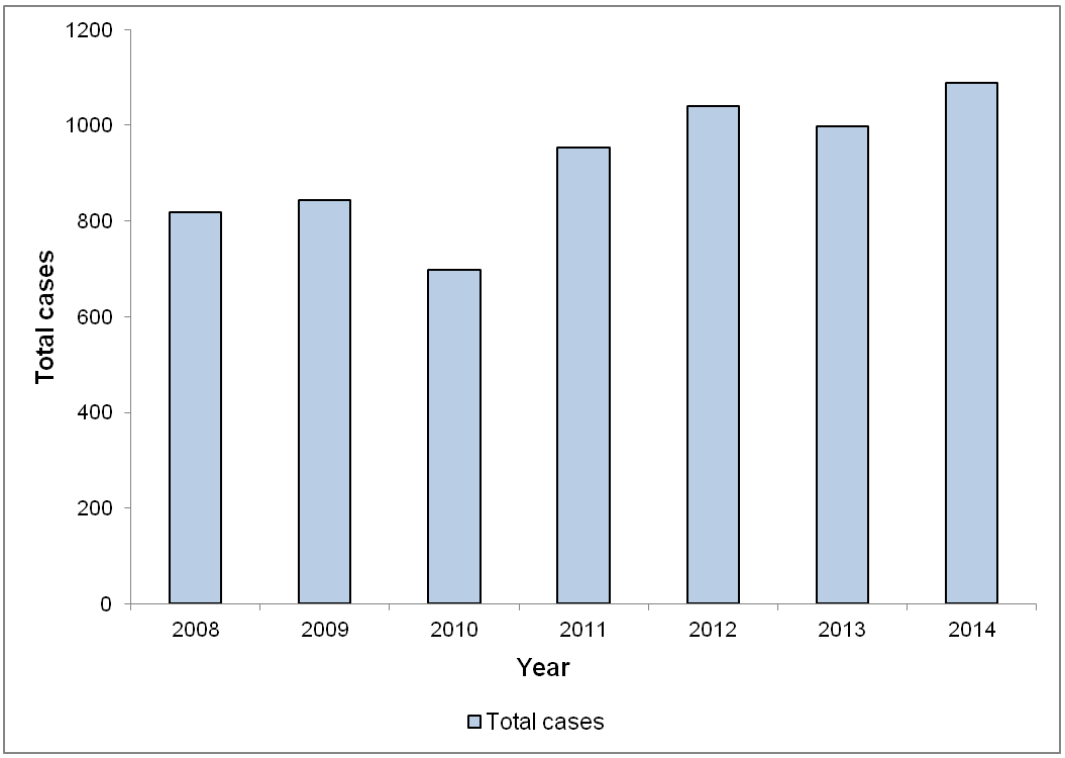
Out of 4724 fires in 2014, 8 fatalities were reported from four cases, recording the highest number of death due to fire for the last twelve years [7]. There was a substantial increase of four fatalities (100%) as compared to those recorded in 2013. In term of injuries, a significant decrease in the number from 162 cases to 111 cases (31.5%) while comparing the two most recent years. The number of casualties was peaked in 2012 with 199 cases, and it showed a downward trend since that year [7].

According to SCDF (2014), fires in residential premises decreased by 64 cases (2.2%), but a slightly increase was reported in those fires in non-residential premises by 32 cases (6.0%). However, a total of 1271 cases were reported as fires in non-building places, greatly differed from 651 cases in 2013, with 95.2% margin. In residential premises, rubbish fires were frequently reported, with more than half of residential fires were due to rubbish chute or rubbish bins, following a drop to five-year low in 2013 [7-8]. Unattended cooking, discarded items, household contents and electrical completed the top five caused of fires in residential premises in Singapore [7]. In 2014, the number of fires in commercial premises such as eating establishment, shopping complexes, offices, hotels *etc.* decreased by 7 cases (2.5%) from 284 cases in 2013. However, the number of fires in industrial went up from 141 to 173 cases (22.7%), leading to an increase of 6.0% in the total number of fires in non-residential premises. Electrical origins involving electrical appliances, lightings, wiring and cables, as well as the circuit breakers and switch boxes were the main cause of fires in both shopping complexes and industrial premises. For fires in non-building places, as mentioned previously, the rise in vegetation fires from 185 cases in 2013 to 852 cases in 2014 (360.5%) has contributed largely to the increase. Besides, vehicle fires continued to increase by 6.9% but a significant decrease of 48.7% was observed in rubbish fires in open space. Above all, dropped light remained the highest contributing cause of fires, with 2461 cases (52.1%) from the total cases of all fires. Note that dropped light referred to lighted cigarette butts that were not completely distinguished, as well as embers from charcoal and lighted incense sticks. The accidentally or intentional disposal of these lighted materials onto any flammable ingredient can easily lead to fires [7].

Fire Statistics in Indonesia

Indonesia, being one of the biggest nation in South-East Asia has a wide spread of islands with thick tropical forest. Forest fire in

Indonesia during dry season has become a regional problem occurring annually. Our literature search has not encountered a national report on fire statistics, but the Fire Department of Jakarta Province published its statistics online [9]. A total of 1089 cases were attended by the Fire Department of Jakarta Province in 2014, in Jakarta, Indonesia. Fig. 6 illustrates the total fire cases in Jakarta, Indonesia from 2008 to 2014. The figure increased by 91 cases (9.1%) from 998 cases reported in 2013 [9]. The trend of fire occurrence in Jakarta, Indonesia remained stable for the last four years, after a low annual figure was recorded in 2010 with 698 cases [9].



(Source: Fire Department of Jakarta Province, 2014)

Fig. 6: Total fire breakouts in Jakarta, Indonesia, 2008-2014

Table 1 illustrates the statistics on the fire breakouts in Jakarta, Indonesia for 2013 and 2014. From the statistics of Fire Department of Jakarta province, Indonesia, fires killed 34 civilians in 2014, reduced by 8 (19.0%) compared to 42 deaths in 2013 [9].

Table 1: Statistics on fire breakouts in Jakarta, Indonesia for 2013 and 2014

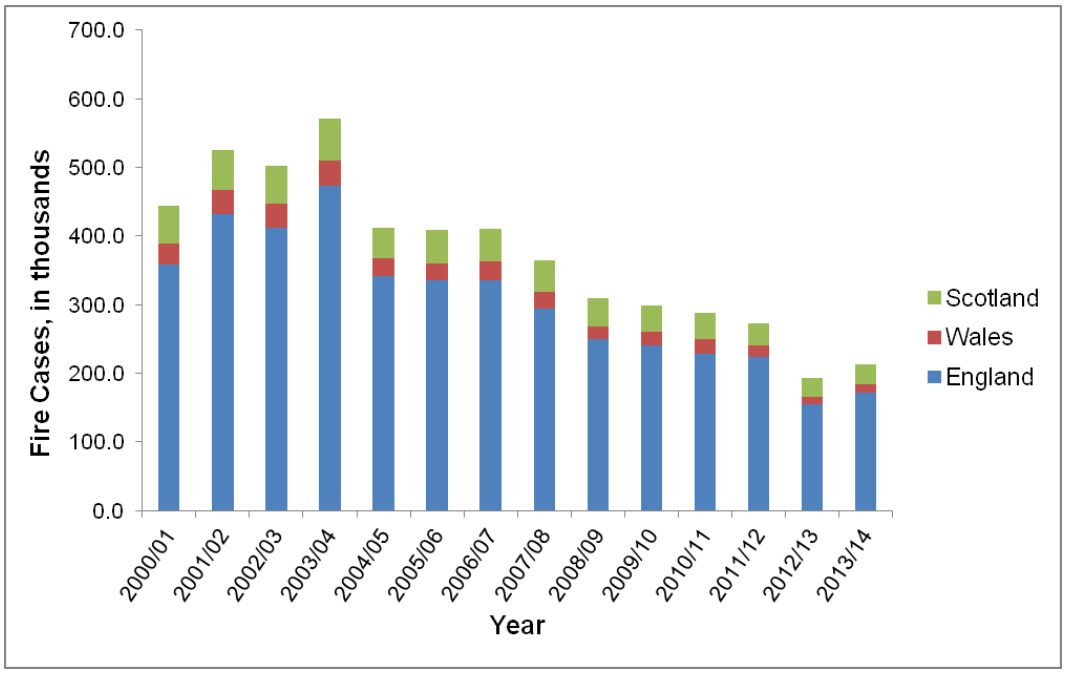
Item	2013	2014
Number of fire breakouts	998	1089
Number of death	42	34
Number of injuries	157	94
Estimated loss (millions USD)	18.8	29.5

The number of injuries was also greatly decreased by 63 cases (40.1%) in 2014 [7]. It is encouraging to note a decline in the number of injuries and also the number of death. Fires cause great loss of 29.5 million USD in 2014 alone [9]. This figure went up by 55.3% or 10.7 million USD from 18.8 million USD in 2013. According to the Fire Department of Jakarta province, Indonesia, electrical sources were the highest cause, contributing to about 70% from the total cases for the last three years. Therefore, due to upward trend of fire breakouts, the governmental agency has suggested the use of electrical sources in a wiser way [9-10].

Fire Statistics in Great Britain

From the statistics released by the Fire and Rescue Service in Great Britain, a total of 212,500 fires have been attended from April 2013 till March 2014 [11]. Fig. 7 illustrates the statistics of fire breakout in Great Britain from 2000/2001 to 2013/2014. In general, the overall pattern of the fires in Great Britain followed a downward trend since 2003/2004, although the figure increased by approximately 19,800 cases (10.3%) from 192,700 in 2012/2013 to 212,700 in 2013/2014 [11]. According to the authorities, the increase in outdoor fires by about 20.0%

contributed to the increase in the total fires in Great Britain. Moreover, these outdoor fires constituted approximately two thirds of total fires over the countries [11].



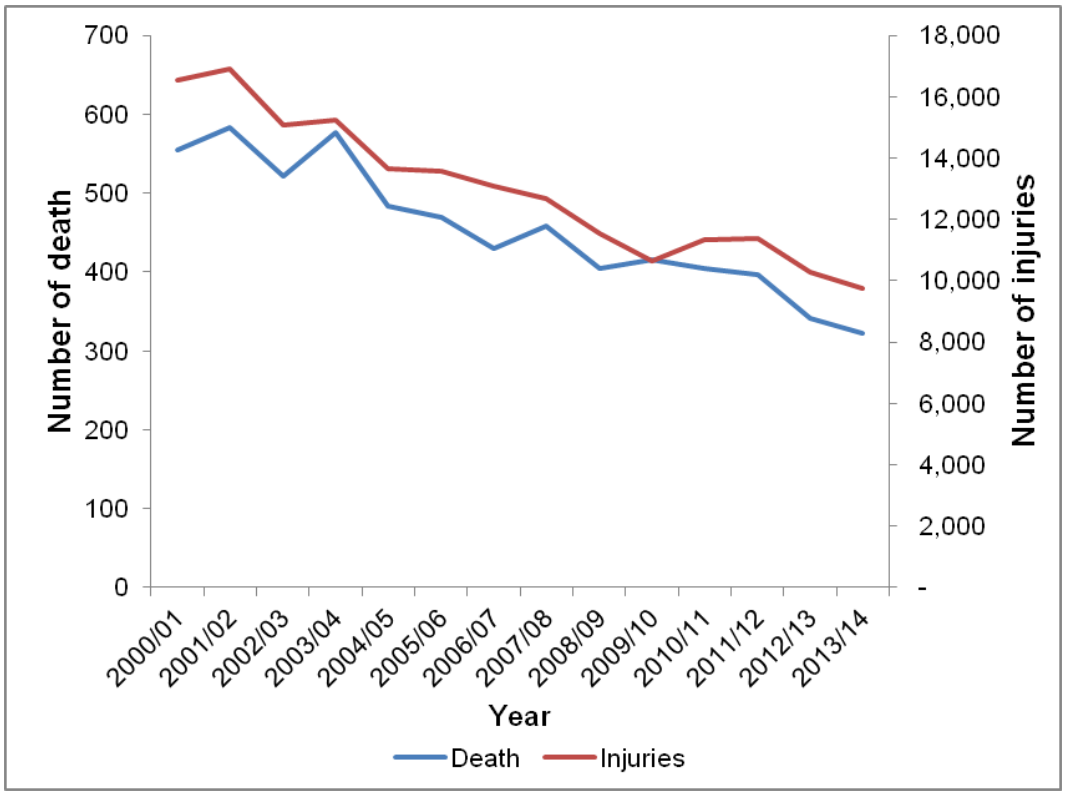
(Source: Department for Communities and Local Government, 2014)

Fig. 7: Total fire breakouts in Great Britain (England, Wales and Scotland), 2000/2001-2013/2014

Out of 212,500 fires, 322 fire-related deaths were reported in Great Britain, with 273 in England, 17 in Wales and 32 in Scotland [11]. Fig. 8 illustrates the statistics of fire-related death and injuries in Great Britain from 2000/2001 to 2013/2014. The figure reduced by 20 cases (5.8%) as compared to 342 deaths in 2012/2013, and became the lowest annual figure since 2000/2001. In term of injuries, a total of 9,748 cases were reported, 5.3% lower than the previous year. Similar to those reported in the number of death, the figure in injury cases was also the lowest for the last 13 years [11].

Fire and Rescue Service in Great Britain classified their fires into primary fires, secondary fires and chimney fires and outdoors [11]. Primary fires referred to all fires in building, vehicles and other structure, involving injuries, rescues or being attended by five or more appliances. Secondary fires are majority of outdoor fires, unless they involve injuries or rescue, property loss or the attendance of five or more appliances. Besides, chimney fires include any fire in an occupied building in which the fire was confined with the chimney structure, and did not involve injuries, rescue or attendance of five or more appliances.

According to the Fire and Rescue Service in Great Britain, the number of primary fires declined by 2.3% from 90,600 in 2012/2013 to 88,500 in 2013/2014, continuing the downward trend since 2001/2002 [11]. Among the primary fires, 59,000 cases are building fires with a 3.3% decrease, and another 29,500 outdoor fires with a slightly decline of 0.3%. The building fires included those fires occurred in dwellings (39,100 cases), other residential (2,700 cases) as well as non-residential places (17,200 cases). The former two fire types showed decline in cases by 4.6% and 6.9%, respectively, but a marginal increase of 1.2% was reported in the latter. For outdoor fires, majority of the cases are vehicle fires with approximately 78.0% of the total primary outdoor fires.



(Source: Department for Communities and Local Government, 2014)

Fig. 8: The statistics of fire-related death and injuries in Great Britain, 2000/2001-2013/2014

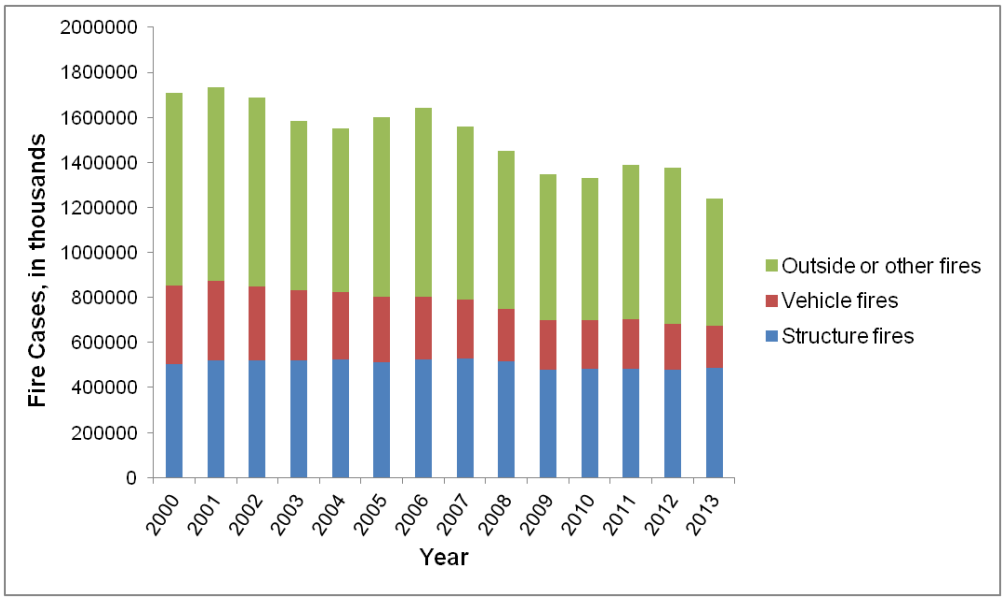
A total of 116,300 cases were classified as secondary fires in 2013/2014 in Great Britain [11]. Amongst, fires on refuse or refuse containers contributed to about 61,000 cases, 47.5% of the total secondary fires. Besides, 36,800 cases (31.6%) were greenland and healthland fires and 15,200 cases (13.6%) were other fires which did not fall into any classification. Note that there were also 2,300 cases and 700 cases of secondary fires which occurred in derelict buildings and derelict vehicles, respectively. Lastly, the number of chimney fires decreased from 9,400 cases in 2012/2013 to 7,700 cases in 2013/2014 by 18.1%.

A number of 66,700 accidental fires were reported in 2013/2014, decreased by 0.3% compared to the previous year. 35,000 cases of accidental fires were occurred in dwellings and another 14,900 cases in other buildings [11]. Additionally, 13,400 of them were vehicle fires and 3,300 were other outdoor fires [11].

On the basis of the cause of fire, misuse of equipment and appliances (25.9%), faulty appliances and leads (15.4%), as well as the placing of articles too close to heat (5.1%) were the top three contributors to accidental fires (59,000 cases) in dwellings and other structure, excluding others (13.2%). Other causes included the faulty fuel supplies, careless handling of fire or hot substances and also playing with fires. In addition to accidental fires, approximately 21,900 cases of deliberate fires were also reported, where the deliberate ignition was merely suspected. Majority of them (9,600 cases or 43.8%) were vehicles fires, followed by 41.1% of dwellings or other buildings fires and 14.6% of outdoor fires [11]. Note that the accidental and deliberate fires considered only the primary fires in the statistics.

Fire Statistics in the United States of America

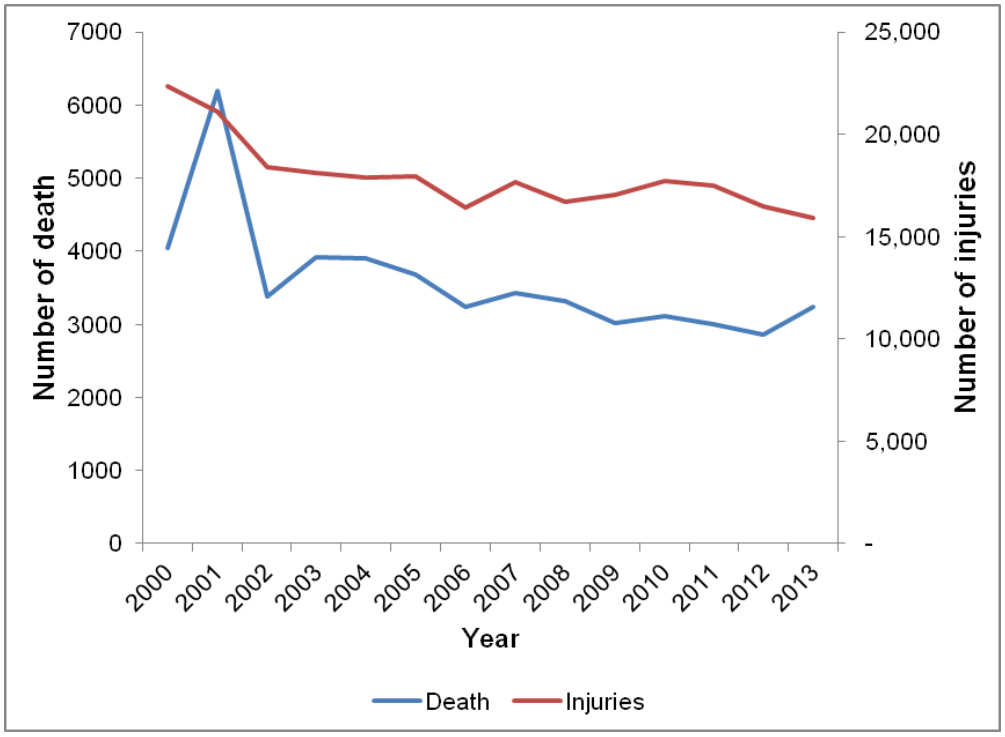
In 2013, an estimated 1,240,000 fires were responded by the Fire Department of the United States of America across the country [12]. Fig. 9 illustrates the total fire breakouts in the country from 2000 to 2013. In one day, the Fire Department attended to approximately 3400 cases through the year. The 2013 figure recorded the lowest annual fires since 2000, following a general downward trend. As compared to 2012, a decline of 9.8% or 135,000 cases were reported [12].



(Source: Karter, 2014)

Fig. 9: Total fire breakouts in the United States of America, 2000-2013

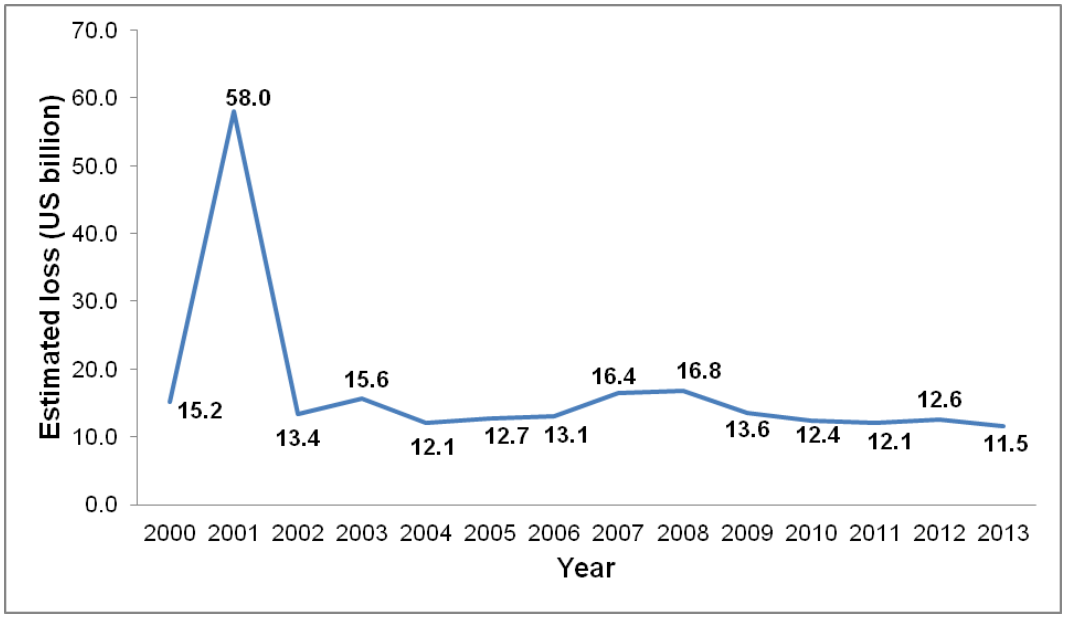
All fires resulted in 3,240 death and 15,925 injuries in the civilian of the country in 2013 [12]. Fig. 10 shows the statistics of fire-related death and injuries in the United States of America between 2000 and 2013. After a declination of the number of death below 3,000 in 2012 (2,855 cases), the figure went up by 13.5% this year. The number of fatalities generally followed a downward trend with years, except 2001 in which 2,451 civilian deaths were reported due to September 11 attacks. On the other hand, a decrease of 3.5% was observed in civilian dire injuries statistics from 16,500 in 2012, and it was the lowest reported annual figure for the last twelve years [12]. According to the National Fire Protection Association (NFPA), a number of civilian injuries were probably not reported to the authorities and lead to its low estimation [12].



(Source: Karter, 2014)

Fig. 10: The statistics of fire-related death and injuries in the United States of America, 2000-2013

The cost of a fire is expensive. Fig. 11 illustrates the estimated loss in US billion due to fire breakouts from 2000 to 2013 in the United States of America. In 2013, a low estimated loss in the direct damage of property was reported, decreased by 8.7% as compared to the previous year. The figures of estimated loss were remained stable for the last five years, except in 2007 and 2008 with significant greater loss at 16.4 billion USD and 16.8 billion USD, respectively [13]. However, 2001 was the year reported with the highest estimated loss at 58 billion USD, when the tragedy of September 11 attack happened. Note that the figure reported in this part involved only the direct losses due to damage of properties by fires.



(Source: Hall, 2014)

Fig. 11: Estimated loss (billion USD) due to fire breakouts

As shown in Fig. 9, NFPA classified the fires on the basis of the types of these incidents [12,14-15]. Structure fires referred any fire in or on a building or other structure which can be considered as structures, even if the structure itself was not damaged due to the fire. Note that mobile structure that used as fixed structure was also considered as structure, whereas a vehicle that burn inside a structure with the fire limited to that vehicle only is not a structure but a vehicle fire. On the other hand, all fires involving vehicles such as highway-type vehicles, and also the aircrafts, rail vehicles, water vehicles, as well as industrial and construction vehicles were classified into vehicle fires. Lastly, any fire that was not a structure or vehicle was included into the classification of outside and other fires. The examples of this classification were outside grass and vegetation fires, trash fires, fires involving storage or equipments, as well as those unclassified fires [14]. Amongst, structure fires contributed to 487,500 cases (39.3%) in 2013 out of the total fires reported in the country [12].

For the last five years, the number of structure fires maintained in approximately 480,000 cases, although 2013 was the highest within these years. For vehicle fires, 188,000 cases (15.2%) were reported with 164,000 fires involving highway vehicles, and 24,000 fires involving other vehicles. Outside and other fires constituted of the major part of fires in the United States of America with 564,500 cases or 45.5% of the total fires. Brush, grass and wildland fires (45.1%) recorded the highest percentage in this type of fires. Note that these fires involved no values or loss. On the other hand, outside structure involving value such as outside storage, crops and timber contributed approximately 67,000 cases or 11.9%. Rubbish fires were also the type frequent occurred fires with a total of 158,000 throughout the years. Another 85,000 cases were considered as other unclassified fires [12]. In general, all the fire types showed declination in the number of cases compared to 2012, except structure fires and other unclassified fires at 1.5% and 6.3% inclinations, respectively.

Current Trends of Reporting Statistics

Typically, the data and statistics for fire breakouts in one country is best if they are collected, analysed and evaluated the national fire service party in that particular country. As such, the report released by that party can serve as a governmental policy to respond to the fire breakouts and also raise awareness of fire risks. Additionally, improvement of policies and development of interventions can be established based on the statistical reports and feedback of the fire performance, and therefore raised the public awareness on this issue. In term of data collection and fire breakouts assessment, most of the countries across the globe have done their responsibility. But still, certain weaknesses were observable in all the report and statistical releases by all the governmental or private parties.

The statistics concerning fires, as well as the causes and consequences of fires are gathered through varying channels, including the fire services, insurance companies, police reports, medical statistics, and also government surveys [16]. Amongst, the national fire service is the best candidate to report and maintain a national database. In Malaysia, the statistics of fire breakouts were published on the official website of the FRDM, clearly indicating the number of fire breakouts, number of death and injuries as well as the types and causes of fire breakouts [2]. Department of Statistics Malaysia has taken its role in collecting, interpret and disseminate the latest and real statistics to monitor the national economical and social development, including the fire outbreak cases in the country. The annual report released by the department displayed the statistics for the last five years, enabling the investigation of the trends of these cases, and leading to the establishment government policy and development of necessary intervention [3]. In some countries such as Germany, the fire services of individual regions or municipalities retain the independent in measuring and analyzing the fire cases in the country, and they process the data differently in certain instances [17].

The need for a better classification

Our review shows that there is different classification schemes used to categorise fire. A simple statistical record might includes only the fire occurrence, fire deaths and injuries, as well as the total losses due to fire breakouts. There are also more comprehensive statistics across the globe with the report on the types, sources and causes of fires, together with their subdivision respectively. For instances, Great Britain recorded their fires as primary fires, secondary fires as well as chimney fires [11]. On the other hand, the United States of America categories the fires into structure fires, vehicle fires, as well as outside and other fires [14]. Building and vehicle fires were classified as primary fires in Great Britain, but they are grouped into two different categories by the United States of America.

In Malaysia, the fires are grouped into more categories. Besides structure fires, vehicle fires and others reported by NFPA, additional categories including machinery and other equipment, petrol and chemicals, gas, plantation and forest fires, as well as those fires occurred in the stalls, airplane and ship. In Singapore, another way of reporting fires was established, involving fires in residential premise and non-residential premises, as well as those fires in non-building places. In such breakdown of fires by the types of premises, vehicle fires are categorized in the group of non-building places. Table 2 illustrates the classification of the types of fires in four different regions or countries.

There are significant differences in the way of reporting of fire cases in different countries. Without generalizing the categories and standardizing the data collection procedure, the direct comparison of fire statistics is nearly impossible, and inaccurate results and interpretation could be arisen.

Table 2: The classification of the types of fires in Great Britain, the United States of America, Malaysia and Singapore

Countries or Regions	Types of Fires	Breakdown of the types of fires
Great Britain	Primary fires	Fires in building, vehicle and also those in other structures (involve injuries, rescues or attended by appliances)
	Secondary fires	Outdoor fires (involve injuries, rescues or attended by appliances)
	Chimney fires	Fires confined within chimney structure (involve no injuries and rescues or not attended by appliances)
The United States of America	Structure fires	Fires in or on a building or other structures
	Vehicle fires	All vehicles, including highway types, aircrafts, rail and water vehicles
	Outside or other fires	Vegetation fires, fire involving storage and equipment and unclassified fires
Malaysia	Building and its contents	-
	Vehicle fires	-
	Machinery and other equipments	-
	Petrol and chemicals	-
	Gas	-
	Plantation and jungle fires	-
	Stall	-
	Aeroplane	-
	Ship	-
	Others	-
Singapore	Fires in residential premises	Fires in public and private premises
	Fires in non-residential premises	Fires in commercial, industrial, social and communal premises
	Fires in non-building places	Vegetation, rubbish in open space and vehicle fires

The need for a better statistical report

As mentioned previously, a number of developed countries released their annual reports, including the generalized statistical data, the problems and issues they are facing, as well as the management and intervention plan to encounter the problems arisen from fire breakouts. They involved the structured statistical services with good coverage from responsible parties in the country, such as the fire services and insurance claim companies. Therefore, most fire incidents were reported and complied [16]. But still there are many countries in this world which do not have such resources to develop a comprehensive statistical report, especially for those third world countries. Their resources to develop such good report were lacking, where there was tendency for an artifice of lower level of reporting, with apparently lower fire breakouts [16].

A good report should contain the statistical data for previous years up to the current year. Of course, to gather all the data together for a significant extended period needs more effort from the responsible party. An established organization or departmental agency might have no restriction and obstacle to develop such a comprehensive statistical report. However, the countries that lack in resources, and even those countries without any policy to develop such statistical report always face difficulties to produce the report. Advice and cooperation given by those countries with established protocol and resources in generating and interpreting the data could contribute to the development of database and further establishment of statistical report for the benefits of the people of the countries. Besides, it also enables the sharing of information about fire, especially those issues faced by majority of the countries like forest fires. Further collaboration could have aid in tackling the common issues, such as forest fires, by cutting down the cost of intervention and preventing the reoccurrence of these cases around the world.

The Future of World Fire Statistics

It is no doubt that fire statistics is of importance in persuading government to adapt interventions and strategies, which aimed to determine the cause of fire, to eliminate the possible risk of fires and to reduce the cost of fire. With the destructive behaviours of fire, it has been the concern of fire services

worldwide to tackle and overcome the issues. From the literature reviews, the work undertaken by international organizations in gathering and disseminating the fire related cases was still lacking, and most of them might restricted to national governments, particularly for those more developed countries. The varying collection and treatment procedures by different channel of information and different national practices of the respective countries gave to less consistency [16-17]. Nowadays, a need for collaboration and standardization of the statistics on fire breakouts is very crucial and urgent.

As mentioned earlier, the comparison of fire statistics was lacking across the globe, including European itself, and also the leader of the world, the United States of America. The process of gathering disseminating and validating of fire statistics is a huge project and yet a difficult one. However, a collaboration and standardization of these data and information among the countries in fact could lead to benefit of the civilians one step forward. In such context, the fire statistics can be used to track and inform policy and recognized potential consumer related issue such as furniture and electrical settings. Sharing of information and knowledge on tackling fires can also be established among the countries, for example, those countries which frequently affected by forest fires. Additionally, the governments, academia, insurance companies, fire services and fire protection agencies can use the statistics. For all the benefits, World Fire Statistics Center is set up under the Geneva Association, but the main objective of the organization is aimed to establish strategies for reducing the cost of fire [18]. The Center of Fire Statistics (CTIF) with the national committee from the United States of America, Russia and Germany released report containing the fire statistics of many CTIF countries and their cities [19]. About 35 countries have contributed to the common indicators of fire statistics in the report released in 2012, including Singapore and Vietnam from South East Asia. More countries were also contributed to the data gathering and disseminating, such as the statistics of fire services, and also the trends of fire and its relevancy. However, Malaysia is not found in the list of contributor [19]. Besides, the Department for Communities and Local Government also released a fire research report in 2012 focusing on European Countries, and concluded that the consistency in obtaining and recording fire statistics is still lacking from country to country [17].

From our study against the literature, there are works carried out by a number of organizations to gather, interpret, validate and disseminate all the statistical data from the contributing countries. Recently, there was also increase number of members from both governmental and private parties from different regions and countries which provided more input on policies such as fire prevention topics. But still, the lack of consistency leads to notable omissions in gathering all the statistics [17]. The direct comparison of data on these criteria may be restricted to less number of countries. Therefore, it would be beneficial if all a common set of definitions on fire and its relevance can be provided for recording after the discussion among all the international organizations involved. Although it was said to be difficult to put into practice, but minimum levels of important information can be suggested, such as the number of fires, number of fire deaths, number of injuries, type of causalities, location of fires, and also the cost of fire. A common set of categories based on above criteria would be needed, enabling the inspection of any form of comparison. A detailed statistical data and report should be mentioned the basis of establishing the statistics and also the ways of aligning the dataset. To make the comparable data a success, certain countries or states might need to change or adopt their policies in reporting more consistence data, based on agreement among all the contributing countries.

Across the globe, there are good data collectors in terms of gathering fire statistics. Finland, Norway, Sweden, Holland, Lithuania, Bulgaria, Slovakia, Italy and the United Kingdom were the examples with good and established data collection protocol and technique [17]. Undeniable, the United States of America is also good in such context [15]. However, we often overlooked those countries with limited resources in doing so, and in fact they are the groups of regions or countries which require the most the information that can be generated from the fire statistics and reports. Support and advice from the good data collectors could definitely provide these countries better ways in investigating and evaluating the fire trends and situations, and thus establishing or adopting the best strategies to reach to the bottom billions of the world. In the sense, the gaps between different

countries and the ways for the improvement of consistency can be established.

Conclusion

In conclusion, the collection of common data is not an easy task. The importance and the benefit of a generalized fire statistics involving all the countries worldwide is known but still the goal for its establishment cannot be achieved. It in fact needs the participations, contributions and efforts from all members of the world, regardless of their political, economical and social status. All the stakeholder organizations should share information and knowledge regarding the fire issues that affected almost all the countries, and also understand the risk of fires to all creatures, including the human beings. If the collaboration and agreement become reality in one day, the fire statistics with comparable data can lead to the development of evidence based assessment on strategies, the establishment of fire safety interventions, and also the evaluation of the impact of the current interventions, through research programmes, regular publications and sharing, as well as the organization of international meetings.

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