TECHNICAL REPORT

ISO/TR 17755

First edition
2014-04-15

Fire safety — Overview of national fire statistics practices

Sécurité incendie — Aperçu général sur les pratiques nationales de collecte de données sur les incendies

Reference number
ISO/TR 17755:2014(E)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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The committee responsible for this document is ISO/TC 92, *Fire safety*.

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Introduction

This Technical Report assembles data on national fire statistics practices. Such practices are highly relevant to the estimation of model parameters in standards developed by ISO/TC 92. In the absence of any proposals for international standards on such practices, it is useful to ISO/TC 92 to have an overview of existing practices and their implications for existing fire statistical data.

This Technical Report is an overview of national fire statistics practices. A general call was issued to all nations participating in ISO/TC 92, and 10 countries completed a survey instrument prepared and distributed by TG1 of ISO/TC 92, WG 8:

— Australia

— Canada

— China

— France

— Japan

— Kenya

— (Republic of) Korea

— Russia

— United Kingdom

— USA

The survey instrument is included as Annex A.

In this Technical Report, the analysis is organized into four sections:

— Basic Aspects of Data Collection and Analysis (Clauses 1 to 7)

— General Characteristics of Fires (Clauses 8 to 10)

— Characteristics Related to Cause of Ignition (Clauses 11 to 20)

— Characteristics Related to Mitigation of Fire Severity (Clauses 21 to 25)

There is no analysis of Question 11c on three types of equipment used by fire departments (fire brigades), because there were too few responses for any meaningful analysis. There is no Question 13 due to a numbering error. There is no analysis of Question 15, which contained two general questions inviting uncoded responses on matters not covered in the survey.

Annex B is reserved for references, including published coding manuals for fire reporting for those nations that publish such manuals and websites providing national statistics and related analyses for many countries.

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Fire safety — Overview of national fire statistics practices

1 Methods of estimation (Questions 1-3)

1.1 Summary comments on methods of estimation

Only two countries – Japan and the U.S.A. – reported use of statistical projection in addition to counting. The survey did not ask how statistical projection is used. Fire statistics based on the national fire database are used for Annual Report of Fire Statistics and White Book on Fire Service annually in Japan. All other countries treat their database as a census, but it is not known whether any of these countries calculate or publish the percentage completeness of their database (for example, by calculating the percentage of total national population represented by reporting jurisdictions). In the U.S.A., the National Fire Incident Reporting System (NFIRS) is voluntary and is known to fall well short of complete capture. Accordingly, tallies based on counting are projected to "national estimates" by statistical projection, using a second database that is based on a statistically valid stratified random sample survey.

An option used in the U.S.A. for a national non-fire-related incident database may be useful in other countries that do not want to shift to U.S.A.-style statistical projection for all statistics. The national crime database, maintained by the Federal Bureau of Investigation (FBI), is translated into statistics almost entirely by counting alone. However, for each major crime, there is also a calculation of the crime rate relative to population, based on the combined population of reporting jurisdictions, and the percentage of national population reporting is also reported.

1.2 Methods of estimation by country

Table 1 provides a summary of national responses on methods of estimation.

Table 1 — Methods of estimation, by country

Australia	The Australian Incident Reporting System (AIRS) is based on separate reports on each incident requiring a response by a fire brigade. There is a national standard for coding of incidents, overseen by the National Data Management Group. All fire brigades are participants, and all are required to report on all incidents regardless of size of loss or other characteristics; therefore, the design is a census and there is no adjustment for missing data. Not all fire services in Australia contribute to the national database. Of the fire services that do contribute, some do not include responses from the rural component of their service. Also, not all fires that occur in the community are included in the AIRS National Database. Analysis is by counting only. Most reports are completed by firefighters who lack extensive training in fire investigation and who obtain most of their information from non-professionals such as the owners and occupants of places where fire occurred.
Canada	Canada's databases begin as individual-incident databases at the local fire department level. Data may be aggregated before passing from provincial level to national level. The national level is a council of provincial fire commissioners. There is no mention of any adjustments for missing fire departments or other missing data. There is no mention of an incident-specific database at the national level. Analysis is by counting only. All or nearly all reports are completed by firefighters who lack extensive training in fire investigation.

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Table 1 *(continued)*

China	China's databases begin as individual-incident databases at the local fire department level. A national standard for coding is implemented through a computerized data entry system. There is no mention of any adjustments for missing fire departments or other missing data. Analysis is by counting only. All or nearly all reports are completed by firefighters who lack extensive training in fire investigation.
France	Undetermined
Japan	Every fire incident report should be submitted to the central government (Fire and Disaster Management Agency) from municipalities by legal basis. This agency makes and maintains a National Fire Incident Database with these data. A national standard for coding exists and some parts of these are translated from Japanese in separate sheets. Analysis is by counting and statistical projection is used for Annual Report of Fire Statistics and White Book on Fire Service annually in Japan. Most reports (60-89%) are completed by firefighters who lack extensive training in fire investigation, but some (11-40%) are completed by professionals with extensive training.
Kenya	Analysis is by counting only. Roughly half of all reports are completed by personnel with extensive training in fire investigation.
(Republic of) Korea	Korea uses individual-incident and summary information databases. Analysis is by counting only. Most reports (60-89%) are completed by firefighters who lack extensive training in fire investigation, but some (11-40%) are completed by professionals with extensive training.
Russia	Official statistics on fires and their consequences in the Russian Federation is the Federal Fire Service of the Ministry of the Russian Federation for Civil Defense, Emergencies and Disaster Relief (hereinafter - the Ministry of Emergency Situations of Russia) directly and through appropriate structural units of organs specially authorized to solve the problems of civil defense and the task of preventing and dealing with emergencies on the subjects of the Russian Federation, within the scope of which includes the organization and implementation of the state fire supervision.

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Table 1 *(continued)*

United Kingdom	The United Kingdom's Incident Reporting System (IRS) is based on separate reports on each incident requiring a response by a fire brigade. There is a national standard for coding of incidents. All fire brigades are participants, and all are required to report on all incidents; therefore, the design is a census and there is no adjustment for missing data. Analysis is by counting only. Most reports are completed by firefighters who lack extensive training in fire investigation, but an estimated 10% of reports are completed by personnel with extensive training in fire investigation. The U.K. also conducts periodic household surveys, which provide regular estimates of the percentage of all home fires reported to fire brigades. The U.K. estimates that brigades are called to 1/5 of home fires.
USA	The National Fire Incident Reporting System (NFIRS) is based on separate reports on each incident requiring a response by a fire department and each casualty associated with a reported incident. There is a national manual for coding of incidents, overseen by the U.S. Fire Administration, which administers NFIRS. Fire department participation is voluntary, which means a significant fraction of fire departments do not participate, and some participating fire departments do not report every year. Therefore, NFIRS data is projected using a second database, the NFPA fire experience survey, which is based on summary information reported from a stratified random sample of fire departments. The methods used by most analysts to combine these databases for analysis are documented, but there is no national standard for analysis. Most reports (60-89%) are completed by firefighters who lack extensive training in fire investigation, but some (11-40%) are completed by professionals with extensive training.

2 Fires subject to reporting (Question 4)

2.1 Summary comments on fires subject to reporting

All countries limit reporting to fires that received a fire department response. Some countries incorporate a minimum-loss threshold for reporting, but far more countries recognize that reporting of very small fires often does not occur, even though there should be reporting under the rules. Some countries permit separate, more limited reporting of certain types of very small fires in order to encourage complete reporting of the existence of these fires.

Countries differ on the inclusion of vehicle fires, vegetation fires, and other outdoor fires in their reporting. (This fact was not determined from the survey but has been determined by the authors of the International Technical Committee for the Prevention and Extinction of Fire, now recognized as the International Association of Fire and Rescue Services (CTIF) annual reports on national fire statistics.)

When comparing fire statistics from one country to another, it is important to determine any differences in treatment of vehicle fires, vegetation fires, or well-defined categories of very small fires.

Some countries take special care in the reporting of certain damaging non-fire events that often but not always are associated with damaging fires, such as explosions, lightning strikes, and vehicle collisions.

2.2 Fires subject to reporting by country

Table 2 provides a summary of national responses on fires subject to reporting.

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Table 2 — Fires subject to reporting, by country

Australia	Fires not responded to by fire crew are not required to be reported to the national database. The data on fires and emergencies do not represent 100 percent coverage. An AIRS report is required whenever a fire brigade resource responds to an incident regardless of the size of the incident or the method of notification. Most fires are not reported to fire services. These are usually small fires in the home or in workplaces which go out by themselves or are extinguished by an occupant. We do not have sufficient information to be able to estimate the number of unreported fires.
Canada	All fires that result in Fire Department (FD) response should be reported.
China	Based on the document called "Provisions on the Administration of Fire Statistics" Clause 5, all fires, regardless of loss, should be included in the scope of fire statistics. But in practice, a fire with no property loss or loss less than a defined threshold will not be considered, such as a rubbish fire with no fire damage.
France	Undetermined.
Japan	Basically all fire incidents should be reported. The definition of a fire that should be reported is as follows: *"A phenomenon of combustion that is generated or spread against human intention or generated by arson and that requires extinguishment by use of fire control equipment or something with similar effects or is a phenomenon of spread explosion."* As for more concrete examples, some very small fires, such as a cigarette smoldering fire within a wastebasket, which can be easily extinguished with a cup of water or a similar method, would be excluded, even if it is unwanted. Some small fires may not be reported unless they are noticed and reported by neighbors. This is because people in Japan usually have the culture to regard having fire in their property as a social stigma.
Kenya	Fires should be reported if they exceed the threshold for minimum damages.
(Republic of) Korea	No matter how small the fire is, almost all fires can be either recognized by fire station or reported.
Russia	Official statistical accounting is required for all fires, for the elimination of which fire brigades were dispatched, as well as fires in the elimination of which fire brigades did not participate, but information of which came from individuals and legal entities.

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Table 2 *(continued)*

United Kingdom	A fire is an incident, attended by a local authority, of uncontrolled burning involving flames and/or heat and/or smoke. An unknown number of departments employ truncated/reporting thresholds. These thresholds are determined on a department by department basis. Fire does *not* include the following except when they cause fire or occur as a consequence of fire: — Explosions * — Lightning — Electrical discharge * Fireworks/petrol bombs which extinguish themselves and do not cause damage are not reportable as a fire incident, but instead as a False Alarm, unless firefighting action is required, in which case, it will be a fire incident. All fires included in the official definition, given in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3", should be reported. Fires are categorized for analysis and reporting purposes according to major incident type in the following way: — Primary fire: includes all fires in buildings, vehicles and most outdoor structures or any fire involving casualties, rescues or fires attended by five or more pumping appliances. — Secondary fire: an incident that did not occur at a Primary location, was not a chimney fire in an occupied building, did not involve casualties (otherwise categorised as a Primary incident) and was attended by four or fewer pumping appliances (otherwise categorized as a Primary incident). — Chimney fires: any fires in buildings where the fire was contained within the chimney structure and did not involve casualties, rescues or attendance by five or more pumping appliances.
USA	All fires that result in a fire department response should be reported. An unknown number of departments employ truncated/reporting thresholds. These thresholds are determined on a department by department basis. Fires are categorized for analysis and reporting purposes according to major incident type in the following way: — Structure fire: includes building fire, fire in structure other than a building, four types of mobile properties used as a fixed structure, such as a manufactured home, and six types of "confined" fires, such as a chimney or flue fire, for which detailed reporting is not required — Vehicle fire: includes nine categories of vehicles — Outside rubbish or trash fire: includes six categories of trash fires, which also do not require detailed reporting, including outside trash receptacle and two types of landfills — Vegetation fire: includes four types of cultivated vegetation and four types of other natural vegetation — Special outside fire: includes outside storage, outside equipment, outside explosion without sustained fire, outside mailbox, and unclassified special outside fire — Unclassified (other) The other database used for calibration does not estimate property damage for non-cultivated natural vegetation, which is a problem for estimates of wildland fire damages.

3 Fire deaths subject to reporting (Question 5)

3.1 Summary comments on fire deaths subject to reporting

Countries differ regarding their use of reports from fire departments and medical records, as well as on their efforts to coordinate both sources into a comprehensive database using consistent definitions.

Countries differ regarding the length of time after injury when a death is formally recognized as a fire death. Regardless of the formal length of time defined by a country, actual reporting may depend on

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the country's ability to capture developments occurring after the victim leaves the fire scene. A delayed death may not become known to the fire authorities and may not be recognized as originating with a fire injury by medical authorities.

Countries differ in their treatment of fatal injuries received in an incident involving fire and non-fire harm to the victim, such as an automobile collision followed by fire or a building collapse following fire.

3.2 Fire deaths subject to reporting by country

Table 3 provides a summary of national responses on fire deaths subject to reporting.

Table 3 — Fire deaths subject to reporting, by country

Australia	The Australian Incident Reporting System (AIRS) Standard defines fire fatalities as "***those people who died from injuries that are attributable to the incident or the action of handling the incident***". The number recorded is based on data which is the best available at the time of the incident. However, in recent years, fire fatality information has been sourced from the Australian Bureau of Statistics for reporting to Government and fire brigade databases. Annual fire death rate represents all deaths where the underlying cause of death is fire related to smoke, fire and flames including all (structure and landscape) fires — as recorded in *Causes of Death, Australia* (ABS cat. no. 3303.0). Fire deaths are identified from cause of death information supplied by the medical practitioner certifying the death or by a Coroner. Fire deaths are reported by year of registration of death at State and Territory Registrars of Births, Deaths and Marriages.
Canada	The Canadian definition of a fire fatality is "***a person who dies as a result of injuries sustained during a fire incident***". Examples of fire-related deaths that are likely to be recorded as non-fire deaths and not included in the database include people who die by fire resulting from vehicle accidents and deaths from a fire that is otherwise controlled (e.g. death by CO poisoning) and so does not receive a fire department response. As for fire deaths likely to be missed, as opposed to captured but not reported under fire, some jurisdictions in Canada (ON) count a death as a result of injuries sustained that must occur within one year and one day of the incident. There are differences between jurisdictions.
China	The Chinese official document called « Provisions on the Administration of Fire Statistics », clause 7, defines that "***all of the deaths due to burn, throwing, smashing, fried, suffocation, poisoning, electric shock, high temperature, radiation and other causes during fire and fire-fighting, should be considered into fire statistics***". The fire deaths taken into account are those which occurred within 7 days after the fire. If a fire is followed by an explosion or by any other incident, and identified as another safety incident, the death(s) should not be included into the input data of a fire death. Furthermore, if the fire is suspected to be an arson fire, and if it is proved, after investigation, that it is an arson fire, the death(s) should not be included in the input data of a fire death.

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Table 3 *(continued)*

France	Officially undetermined (No survey returned). But actually there are two different fire fatality databases in France: one is realized by the Home Ministry-DGSCGC and the other by the INSERM- CepiDc. The database realized by the Home Ministry - DGSCGC is implemented by the fire services. All the deaths which occurred on the scene of a fire are taken into account. Deaths (due to acute fire effects) of firefighters, fire officers, fire brigade personnel and other emergency responders are also reported. This database does not take into account the fire casualties which will die at the hospital or during their transportation to the hospital by EMS. Some elements of this database are published every year by DGSCGC through a special document. The 2012 edition (for 2011) detailed the number of French fire services which have contributed to the national database and the number of fire fatalities which occurred on the scene of fires. This publication does not detail the age, gender, ethnicity (strictly forbidden by the law), activity when injured, type and severity of injury, behaviors that contributed to injury, part of body injured. It just specifies the type of fire during which the death occurred, such as home building, public building, forest fire. The database realized by the INSERM- CepiDc is compiled from the medical death certificates completed by physicians. Since 2000, the causes of death are coded according to the tenth revision of the International Classification of Diseases of WHO. The data are based on the underlying causes of death selected by the WHO rules. This database includes all the fire deaths which occurred in France (Metropolitan and ultramarine): on the scene of the fire, during the transportation and at the hospital. Suicides by fire are also included in this database. INSERM-CepiDc uses CIM 10 codes: X00-X009, X01-X019, X02-X029, X03-X039, X04-X049, X05-X059, X06-X069, X08-X089, X09-X099, W35-W409, X97-X979.
Japan	Fire brigade, who handled casualties at the fire, confirms whether or not a death was caused by fire. "***The death within 48 hours after fire***" is regarded as fire death by definition in Japan. But, at the same time, for the purpose of reporting the number of fire deaths to WHO, fire deaths within one month are also recorded. The deaths by fire in a report are confirmed by fire brigade after listening to the medical doctor who treated the fire casualties.
Kenya	The Kenyan definition of a fire fatality is a death which is caused by *"**accidental fires and fires caused by non-fire conditions e.g. lightning, electrocutions and natural fires***". Lightning, negligence, arson, and scalding are examples of circumstances that can result in a death being recorded as a non-fire death.
(Republic of) Korea	The Korea definition of a fire fatality is "***a death occurred within 24 hours from a fire***".
Russia	For the Russian Federation, a fire fatality is a "***person who died from exposure to hazards of fire and/or related manifestations of the hazards of fire, falling from a height of panic***", except when the death occurred during a road traffic accident, air and rail disaster force-majeure circumstances, and in sites enjoying the right of extraterritoriality.

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Table 3 *(continued)*

United Kingdom	For United-Kingdom, the definition of a fire fatality is given in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 3.5**: "***Killed/ Fatality - a person who has died as a direct or indirect result of injuries received at the incident***" and specified at **question 9.21**": "***in general, fire-related deaths are those that would not have otherwise occurred had there not been a fire***".
USA	For United States of America, a fire fatality is "***a person who is killed as a result of a fire, including death from natural or accidental causes sustained while involved in the activities of fire control, attempting rescue, or escaping from the dangers of the fire***". Independent of fire incident data collection, a fire related death will be captured when exposure to fire, fire products, or explosion was the underlying cause of death or was a contributing factor in the chain of events leading to death, as reported on the death certificate through vital records reporting channels. Examples of circumstances that can lead to exclusion of a death, include automobile collision resulting in fire, in which the fire caused death may not be identified as fire deaths. Deaths captured through coroners/vital records reporting channels are dependent upon recording personnel ability to determine original cause of a fire-related condition that contributes to death. Examples of deaths that may be missed include deaths that occur after the fire incident report is completed – not necessarily just due to extended time lag. Closing the loop between medical and fire reporting systems requires a degree of coordination that does not happen in an unknown number of instances. Although not common, there may be some fire departments that do not report fire deaths on NFIRS records. Governmental and Non-Governmental Organizations (NGOs) may choose specific ICD-10 codes for inclusion in analysis of vital records data, depending upon the scope of the study. United States Fire Administration (USFA) uses ICD-10 codes F63.1, W39-W40, X00-X09, X75-76, X96-97, Y25-26, and Y35.1 to define fire deaths.

4 Fire injuries subject to reporting (Question 6)

4.1 Summary comments on fire injuries subject to reporting

Countries differ regarding their use of reports from fire departments and medical records, as well as on their efforts to coordinate both sources into a comprehensive database using consistent definitions.

Countries differ in their treatment of injuries received in an incident involving fire and non-fire harm to the victim, such as an automobile collision followed by fire or a building collapse following fire.

4.2 Fire injuries subject to reporting by country

Table 4 provides a summary of national responses on fire injuries subject to reporting.

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Table 4 — Fire injuries subject to reporting, by country

Australia	The Australian Incident Reporting System (AIRS) Standard defines injuries as those people who received injuries that are attributable to the incident or the action of handling the incident. For the purposes of incident reporting, an injury is defined as requiring: — treatment by a medical practitioner or; — at least one day of restricted activity immediately following the incident. However, for reporting purposes in recent years fire injury information has been sourced from the Australian Institute of Health and Welfare. Fire injuries are represented by hospital admissions (excluding emergency department non-admitted casualties) and are reported by the State or Territory where the admission occurs. A person injured by fire may be treated more than once, and in more than one State or Territory. Deaths from fire injuries after hospitalization are removed from the fire injury data for the time series because these are counted in the fire death rate. In fire department systems, fire injuries where the victim has been transported to hospital prior to brigade arrival may be missed in fire injury reporting.
Canada	A fire injury is a person who is injured as a result of a fire incident.
China	The definition of fire injury refers to the clause 7 of "Provisions on the Administration of Fire Statistics" as follows: all of the fire injuries due to burn, throwing, smashing, fried, suffocation, poisoning, electric shock, high temperature, radiation and other causes during fire and firefighting, should be considered into the fire statistics. The statistical standards for injuries are identified by the relevant provisions of the Ministry of Labor.
France	Officially undetermined (No survey returned). But actually the database realized by the Home Ministry - DGSCGC is implemented by the fire services. The database realized by the Home Ministry - DGSCGC is implemented by the fire services. All the injuries which occurred on the scene of a fire are taken into account. Injuries (due to acute fire effects) of firefighters, fire officers, fire brigade personnel and other emergency responders are also reported. Some elements of this database are published every year by DGSCGC through a special document. The 2012 edition (for 2011) detailed the number of French fire services which have contributed to the national database and the number of fire injuries which occurred on the scene of fires. This publication does not detail the age, gender, ethnicity (strictly forbidden by the law), activity when injured, type and severity of injury, behaviors that contributed to injury, part of body injured. It just specifies the type of fire during which the injury occurred, such as home building, public building, forest fire.
Japan	Fire brigade, who handled casualties at the fire, confirms whether or not an injury was caused by fire. The cause of injuries in an automobile collision where there was also a fire is confirmed by fire brigade after listening to the medical doctor who treated the casualties in order to make sure of whether or not the injury is attributed to fire. An example of injuries that could be missed would be someone who suffers minor burns caused by ignition on apparel by flame of a cooking stove, but the burn is not so serious for him or her to go to hospital.
Kenya	Shock, smoke inhalation, body damage, fire injuries due to fire effects.
(Republic of) Korea	An injury which needs medical care within 1 year or needs emergency room care at least for 1 day.
Russia	All people injured on the scene of fire from exposure to hazards of fire and/or related manifestations of the hazards of fire, such as falling from a height of panic, are to be recorded.

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Table 4 *(continued)*

United Kingdom	For United-Kingdom, the definition of a fire injury is given in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 3.5**: "***Injured/Non fatal - a person injured as a direct result of the incident (but not fatally injured) who required first aid (provided by anyone) at the scene or more medical treatment than could be given at the accident. This includes any person advised to attend hospital or see a doctor, whether or not they actually follow up the advice***". All should be recorded. Completeness is believed to be good including all physical injuries, not just burns and smoke.
USA	A fire injury is a person who is injured as a result of a fire, including injuries from natural or accidental causes sustained while involved in the activities of fire control, attempting rescue, or escaping from the dangers of the fire. Injuries are also captured by a sample survey of hospital emergency rooms and reported to the Consumer Product Safety Commission (National Electronic Injury Surveillance System, NEISS). Fire injuries that occur in a combination of injuries from an overarching event, such as earthquake or automobile accident, may not be recorded as fire injuries, and non-fire injuries in such circumstances may be recorded as fire injuries when they were not fire injuries. Other injuries that may be missed include injuries discovered after fire department has closed report, injuries masked by pre-existing conditions, and injuries noticed and treated only by the victim. Also, some fire departments may not report fire injuries on NFIRS records, and far more fire injuries occur in (typically small) fires not reported to fire departments than in reported fires.

5 Victim characteristics (Question 12)

5.1 Summary comments on victim characteristics

Most countries collect information on victim age and gender, and many collect information on other characteristics.

5.2 Recording of victim characteristics, by country

Table 5 provides a summary of national responses on reporting on victim characteristics.

Table 5 — Reporting on victim characteristics by country

Australia	**Not included in reporting.**

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Table 5 *(continued)*

Canada	In the Canadian databases, on the basis of the document named "Canadian Code Structure (CCS) on Fire Loss Statistics", the following characteristics are reported: **Age** (if exact age is not known, give an estimate to the nearest 10 years), **Gender** **Status**: — Firefighter — Civilian **Nature (severity) of casualty** — Death — Minor injury (less than 1 day hospital or off work) — Light injury (1-2 days hospital or 1-15 days off work) — Serious injury (3 days and more hospital or 16 days and more days off work) **Probable/possible cause of casualty:** — Smoke inhalation — Burn — Physical injury — Other **Condition of casualty:** — Asleep at time of fire — Bedridden or other physical handicap — Impairment by alcohol, drugs or medication — Awake and no physical or mental impairment at the time of fire — Under restraint or detention — Too young to react to fire emergency — Mental handicap – includes senility — Child left unattended — Condition of casualty - unclassified

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Table 5 *(continued)*

Canada	**Action of casualty:** — Injured while attempting to escape — Over-exertion, heart attack — Entered or remained for rescue purposes — Entered or remained for fire-fighting — Entered or remained to save personal property — Loss of judgment or panic — Received delayed warning — Did not act — Action of casualty – unclassified **Cause of failure of escape:** — Trapped by rapid spreading of fire/smoke – through vertical openings, stairways, elevators — Trapped by rapid spreading of fire/smoke – through horizontal openings — High flame spread of combustible interior finish — Building collapse — Falling debris — Explosion — Exit blocked, locked, or obstructed — Outdoor fire – includes forest/brush fires — Cause of failure to escape – unclassified

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Table 5 *(continued)*

Canada	**Ignition of clothing or other fabrics:** **Type of clothing or other fabric** — Outer clothing — Sleepwear — Underclothing — Costume — Bedding or bed linen (includes pillow) — Mattress — Rugs — Unclassified fabric — Unknown type fabric **Type of material ignited:** — Cotton — Wool — Other natural fibre — Other synthetic fibre — Mixture of fibres — Rubber — Plastics or plastics foam — Unclassified fabric — Unknown type fabric
China	Not included in reporting.
France	The only information available in the two different fire French databases (Home Ministry-DGSCGC and INSERM- CepiDc) is the number in each type of building (home, public building).

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Table 5 *(continued)*

Japan	**Age** **Gender** **Status**: — Firefighter — Civilian **Nature (severity) of casualty:** — Death — Minor injury (not hospitalized) — Light injury (1 day to 3 weeks hospital treatment) — Serious injury (3 weeks and more hospital treatment) **Probable cause of fatality:** — Intoxication by carbon monoxide or asphyxiation — Burn — Bone fracture or bruise — Incendiary suicide — Others **Probable cause of injured:** — Smoke inhalation — Burn by touch to hot materials — Burn by radiation from plumes — Physical injury — Others

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Table 5 *(continued)*

Japan	**Physical condition of fatality at the fire:** — Asleep or awake at time of fire — Bedridden or not — Impairment by alcohol, drugs or medication — Too young to react to fire emergency — Handicap – includes physical, eyesight, hearing, etc. — Left unattended — Condition of casualty - unclassified **Activity when injured:** — During fire-fighting — During escaping — During sleeping — During working — Action of casualty – unclassified **Cause of failure of escape resulting in fire death:** — Trapped by rapid spreading of fire - through explosion, combustion of hazardous materials, etc. — Delay of fire detection – through deep sleep, heavy drunk, physical handicap, etc.. — Lack of judgment capability – too young to act, too old to act, heavy drunk, physical handicap, etc. — Untimely escape – in confusion, too stick to belongings, while notifying fire to others, trying to suppression, trying to rescue others, etc. — Failure to escape – physical handicap, rapid fire spread, wrong selection of egress route, exit locked, re-entering, etc. — Incendiary suicide — Cause of failure to escape – unclassified
Kenya	Not included in reporting
(Republic of) Korea	**Age** **Gender** **Location** **Activity when injured** **Type and severity of injury** **Behaviors that contributed to injury or escape** **Part of body injured**

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Table 5 *(continued)*

Russia	**Age** **Gender** **Race** **Disabilities, limitations and impairments** **Activity when injured** **Behaviors that contributed to injury** **Social position** **Education** **Cause of death** **Injury conditions**
United Kingdom	**Age** **Gender** **Ethnicity** **Where was the victim when the fire started?** — Room, cabin or compartment of origin — Different room, cabin or compartment on floor of origin — Floor above origin (includes mezzanine above floor of origin) — Two or more floors above origin — One floor below origin – includes stairway leading down from floor — Two or more floors below origin — Outside building, vehicle etc. of origin — Seat of fire unknown or multi-seated (and above non applicable) — Location of person unknown — Not applicable — Other location **Where was the victim found?** — Room, cabin or compartment of origin — Different room, cabin or compartment on floor of origin — Floor above origin — Two or more floors above origin — One floor below origin — Two or more floors below origin — Outside building, vehicle etc. of origin — Seat of fire unknown or multi-seated (and above non applicable) — Location of person unknown — Not applicable — Other location

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Table 5 *(continued)*

United Kingdom	**What role did the victim play in the incident?** — Firefighter on duty — Other emergency service personnel — Resident/occupant — Passer by — Driver — Passenger — Visitor — Employee in workplace — Customer in shop — Other FRS personnel on duty — Other **Was victim rescued?** — Yes — No **If rescued, where was the victim rescued from?** — Room, cabin or compartment of origin — Different room, cabin or compartment on floor of origin — Floor above origin (includes mezzanine above floor of origin) — Two or more floors above origin — One floor below origin – includes stairway leading down from floor — Two or more floors below origin — Roof — Outside building of origin — Not applicable — Other **Circumstances of fatal casualty** — Thought to be already dead when firefighter arrived — Unable to resuscitate, confirmed dead at scene

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Table 5 *(continued)*

United Kingdom	— Unable to resuscitate, confirmed dead at hospital — Alive on leaving scene, but died later — Not known **Has the casualty been reconciled against the appropriate death certificate?** **Was the death/injury fire related?** — Yes (in general, fire related deaths are those that would not have otherwise occurred had there not been a fire) — No — Don't know **What is your understanding of the cause of the death?** — Overcome by gas, smoke or toxic fumes; asphyxiation — Burns – severe — Combination of burns and overcome by gas/smoke — Shock/anaphylactic shock — Other medical condition — Fracture — Other physical injury — Cuts/lacerations — Impalement — Drowning — Hypothermia — Heat exhaustion — Back/neck injury (spinal) — Head injury — Chest/abdominal injury — Chest pain/Heart condition/Cardiac arrest — Other — Unknown

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Table 5 *(continued)*

United Kingdom	**What were the circumstances of the victim?** — Bedridden — Chair-ridden — Other immobility — Suspected under influence of alcohol — Suspected under influence of drugs — Discovering fire — Fell onto fire — Fighting fire (including attempts) — Trapped by fire because unaware (e.g. asleep) — Trapped by fire other than unaware — Trapped by collapse of structure — Trapped by smoke — Injured escaping — Injured rescuing person — Injured rescuing property or animals — Injured being rescued — Injured by blast — Return to fire — Intentionally sustained at start of fire (e.g. suicides and attempts) — Injury accidentally sustained at start of fire — Not applicable — Other — Unknown

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Table 5 *(continued)*

USA	**Gender** **Age** **Race** **Ethnicity** **Severity** — Minor — Moderate — Severe — Life threatening — Death — Undetermined **Cause of injury** — Exposed to fire products — Exposed to hazardous materials other than smoke — Jumped in escape attempt — Fell, slipped or tripped — Caught or trapped — Structural collapse — Struck by or contact with object — Overexertion or strain — Multiple causes — Other (unclassified or unknown type) cause of injury — Undetermined **Human factor contributing to injury** — Asleep with no known impairment — Unconscious — Possibly impaired by alcohol — Possibly impaired by other drug or chemical — Possibly mentally disabled

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Table 5 *(continued)*

USA	— Physically disabled — Physically restrained — Unattended or unsupervised person — No factor **Factor contributing to injury** — Crowd situation or limited exits — Mechanical obstacles to exit — Locked exit or other problem with exit — Problem with quick-release burglar or security bar — Burglar or security bar or intrusion barrier — Window type or size impeded egress — Other (unclassified or unknown type) egress problem — Exit blocked by flame — Exit blocked by smoke — Vision blocked or impaired by smoke — Trapped above fire — Trapped below fire— Other (unclassified or unknown type) fire pattern — Unfamiliar with exits — Excessive travel distance to nearest clear exit — Chose inappropriate exit route — Re-entered building — Clothing caught fire while escaping — Other (unclassified or unknown type) escape — Roof collapse — Wall collapse — Floor collapse — Other collapse — Trapped in or by vehicle — Vehicle collision or rollover

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Table 5 *(continued)*

USA	— Other (unclassified or unknown type) vehicle-related factor — Unvented heating equipment — Improper use of heating equipment — Improper use of cooking equipment — Other (unclassified or unknown type) equipment-related factor — Clothing burned not while escaping — Overexertion — Other (unclassified or unknown type) factor — No factor **Activity when injured** — Escaping — Rescue attempt — Fire control — Returning to vicinity of fire before control of fire — Returning to vicinity of fire after control of fire — Sleeping — Unable to act — Irrational act — Other (unclassified or unknown type) activity — Undetermined **Location at time of incident** — In area of origin and not involved in starting the fire — Not in area of origin and not involved in starting the fire — Not in area of origin and involved in starting the fire — In area of origin and involved in starting the fire — Other location — Undetermined

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Table 5 *(continued)*

USA	**General location at time of injury** — In area of origin — In building of origin but not in area of origin — Outside but not in area of origin — Undetermined **Specific location at time of injury – Same choices as for Area of Origin of fire** **Primary apparent symptom** — Smoke inhalation — Hazardous fumes inhalation — Breathing difficulty or shortness of breath — Burns and smoke inhalation — Thermal burn only — Scald burn — Chemical burn — Electric burn — Cut or laceration — Stab or puncture wound — Gunshot or projectile wound — Contusion or bruise — Abrasion — Dislocation — Fracture — Strain or sprain — Swelling — Crushing — Amputation — Cardiac symptoms — Cardiac arrest — Stroke

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Table 5 *(continued)*

USA	— Respiratory arrest — Chills — Fever — Nausea — Vomiting — Numbness or tingling — Paralysis — Frostbite — Other (unclassified or unknown type) sickness — Miscarriage — Eye trauma or avulsion — Drowning — Foreign body obstruction — Electric shock — Poison — Convulsion or seizure — Internal trauma — Hemorrhaging — Disorientation — Dizziness, fainting, or weakness — Exhaustion or fatigue — Heat stroke — Dehydration — Allergic reaction — Drug overdose — Alcohol impairment — Emotional stress — Mental disorder — Shock

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Table 5 *(continued)*

USA	— Unconscious — Pain only — Other (unclassified or unknown type) primary apparent symptom — Undetermined **Primary area of body injured** — Head — Neck or shoulder — Thorax — Abdomen — Spine — Upper extremities — Lower extremities — Internal — Multiple body parts There are additional, more detailed choices for firefighter casualties

6 Property damage subject to reporting (Question 7)

6.1 Summary comments on property damage subject to reporting

All countries limit reporting to fires that received a fire department response. Some countries incorporate a minimum-loss threshold for reporting, but far more countries recognize that reporting of very small fires often does not occur, even though there should be reporting under the rules. Some countries permit separate, more limited reporting of certain types of very small fires in order to encourage complete reporting of the existence of these fires.

Some countries provide no national reporting of monetary damages but defer to reporting by insurance companies. Some companies (like the U.S.A.) have annual published reports with estimated fire losses calculated separately and independently by fire departments and by insurance companies. Some fire departments may take steps to coordinate their own fire damage monetary reports for individual incidents with those of the responsible insurance company.

Most countries also collect data on property damage using measures other than monetary damages. These may be counts of damaged objects (such as buildings, rooms, floors, or vehicles), area damaged, percentage of area damaged, or a qualitative confinement scale (such as confined to object or room of origin).

6.2 Property damage subject to reporting by country

Table 6 provides a summary of national responses on property damage subject to reporting.

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Table 6 — Property damage subject to reporting, by country

Australia	Australian fire departments define damage to property as the estimated monetary value of the damage to property and contents caused by fire and fire fighting operations. They don't include land value. Measures used are: — Monetary value of loss — Percentage of total area that was damaged, estimated separately at arrival of fire brigade and at extinguishment — Other: confinement rate Some other comments related to dollar loss, source limitations and quality. Recently, one Australian fire department conducted a review of the dollar loss data. They found: a) 17% of building fires had a recorded value of zero fire dollar loss, and an additional 18% had no dollar loss value reported. It is unclear as to what a zero value for dollar loss means: it could mean no or minimal fire dollar loss or it could mean that the dollar loss cannot be determined. Of the building fires categorized as medium to large where the confinement rate extended beyond the room of origin 3% fires had a recorded value of zero fire dollar loss, and an additional 14% had no dollar loss value reported. b) A comparison of dollar loss data with dollar loss data from insurance companies and other external sources revealed significant variability in the estimated dollar loss values reported by fire-fighters. Feedback from focus group workshops with fire-fighters revealed widely varying practices and inconsistencies in estimating and reporting the dollar loss some firefighters included direct and indirect losses; some included relocation and business disruption costs others did not. Firefighters felt it easier to estimate damage for white goods and small household items than for items such as art, jewelry and other high value items.
Canada	Loss shall be recorded as the estimate of the damage caused by the fire. The loss includes damage to property and contents. Loss shall only include direct loss caused by the fire, including salvage, but not indirect loss due to "use and occupancy" or business interruption. Measures used are: — Monetary value of loss Damage likely to be missed includes damage present but not reported by fire departments and damage that is not visible during investigation and reporting.
China	Fire losses include two categories of direct and indirect losses. Until now, just only the fire direct losses should be considered according to the national standard named "Statistical methods for fire direct losses", which is applicable to fire statistics for various types of housing, constructions, facilities and other properties, not apply to the fire loss statistics of currency and securities. Fire losses include two categories of direct and indirect losses. Until now, just only the fire direct losses should be considered according to the national standard named "Statistical methods for fire direct losses", which is applicable to fire statistics for various types of housing, constructions, facilities and other properties, not apply to the fire loss statistics of currency and securities. Measures used are (based on national standards "Statistical Methods for Direct Fire Property Loss"): — Monetary value of loss — Indoor area damaged (for example, square meters in a building) — Number vehicles damaged (vehicles moving fire is regarded as a transportation accident, not a fire. The fire brigade just concern about the transport tool fire, just like in parking).
France	Undetermined.

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Table 6 *(continued)*

Japan	The items of following property loss should be recorded in a report for each fire incident regardless the size of fire: — Extent of fire (very small, partially burned, burned roughly half, totally burned) — Area of burned total floor area in m^2 — Area of burned total surface area in m^2 — Number of burned structures — Number of suffered households from fire — Monetary loss (loss of fixed asset, loss of movable asset, and the total) in 1000 yen The loss items in a fire incident report should be recorded for every case. Even if there is no loss or damage, it is filled in with "zero".
Kenya	Not included in national reporting. Damages are reported to insurance companies. Measures used in reporting below national level are: — Monetary value of loss — Indoor area damaged (for example, square meters in a building) — Outdoor area damaged (for example, acres in a wildfire) — Percentage of total area that was damaged — Number of rooms damaged — Number of floors damaged — Number of buildings, structures or vehicles damaged
(Republic of) Korea	Because every fire is reported, any damage related to fire scene will be counted as fire damage. Measures used are: — Monetary value of loss — Indoor area damaged (for example, square meters in a building) — Outdoor area damaged (for example, acres in a wildfire) — Percentage of total area that was damaged Losses are determined by specific rules which calculate monetary amounts. In this process there might be an error on the monetary amount, but there is no omission. Even a zero amount is included in report.
Russia	Fire losses include two categories of direct and indirect losses. — Monetary value of loss — Number of buildings destroyed and damaged by fire — Residential apartments or rooms — Floor area — Automotive vehicles and other equipment — Cereals and grain legumes — Feed — Industrial crops — Cattle and sheep, or animals — Birds

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Table 6 *(continued)*

United Kingdom	From the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" part "On attendance –Damage (page 105 to), the damages are the total loss to the structure and contents, including contents damaged by fire, heat, smoke, water. Monetary damages are not included in national analyses, which defer to insurance companies. Measures used at the national level are: **— Indoor area damaged (for example, square meters in a building):** - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.20**, "the estimated flame and/or damage on arrival". - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.24**, "the horizontal area damaged by flame and/or heat at stop". - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.25**, "the horizontal area damaged by flame and/or heat and/or smoke and/or water at stop". **— Outdoor area damaged (for example, acres in a wildfire):** - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **questions 8.35 and 5.16a**, "the estimated outdoor fire damage by flame and/or heat and/or smoke". **— Number of rooms damaged:** - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.20**, "the estimated extent of flame and/or heat damage on arrival". - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.22**, "the extent of flame and/or heat damage at stop".

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Table 6 *(continued)*

United Kingdom	**— Number of floors damaged:** - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.20**, "the estimated extent of flame and/or heat damage on arrival". - Should be reported as required in the document named "Incident Recording System (IRS) Help and Guidance – version 2.3" **question 8.22**, "the extent of flame and/or heat damage at stop". Spread from one primary property to another primary property (or a secondary property) will only show the damage for the first property damaged. Only the distance, in meters, between the incident location and the neighboring property(s) will be shown. Spread from 'secondary' (e.g. some outdoor structure types) property to a primary property (including all vehicles & buildings that are not derelict) will only show the damage to the primary property.
USA	Rough estimation of the total loss to the structure and contents, in terms of the cost of replacement in like kind and quantity. This estimation includes contents damaged by fire, smoke, water and overhaul. Data exclude indirect loss, such as business interruption, temporary housing for displaced residents, and loss of use of equipment. Some individual FDs use reporting thresholds based on direct dollar loss. Measures used are: — Monetary value of loss — Outdoor area damaged (for example, acres in a wildfire) — Percentage of total area that was damaged — Number of buildings, structures or vehicles damaged — In a structure, qualitative confinement of fire (such as confined to object of origin, confined to room of origin) Damage not readily apparent at time of investigation/reporting may not be reported. Some damage may be present but not reported by fire departments. Also, there may be some fire departments that do not report direct property damage at all on NFIRS records.

7 Other losses subject to reporting (Question 8)

7.1 Summary comments on other losses subject to reporting

Nearly all countries collect data on firefighter deaths and injuries due to acute fire effects, and most collect data on other firefighter deaths and injuries sustained while on-duty. Only Kenya reports data collection on chronic illness and related death for firefighters.

Kenya is also the only country to report data collection on indirect property damage (also called consequential damage, including business interruption and temporary housing), environmental damage, or damage to cultural heritage.

7.2 Other losses subject to reporting by country

Table 7 provides a summary of national responses on other losses subject to reporting.

Table 7 — Other losses subject to reporting, by country

Australia	Not included in reporting.
Canada	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects.

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Table 7 *(continued)*

China	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. Indirect fire loss refers to any fees caused by the business interruption, on-site rescue, recovery and disposal (including medical, funeral, pension, subsidies and relief costs) due to fire. In past years, we did statistics for consequential damage, but it is very difficult to quantify, and now it isn't considered when we conduct fire statistics. We will restart this work item when a better method can be found.
France	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects.
Japan	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. — Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty.
Kenya	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. — Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty. — Fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders due to chronic illness or other possible effects of long-term exposure to fire effects. — Costs of business interruption, including business closure and other loss of mission continuity. — Costs of temporary housing or other arrangements made necessary while permanent repair or replacement of fire-damaged property is underway. — Environmental damage. — Damage to cultural heritage. — House hold losses, damage caused by fire on house hold items (e.g. carpet, television).
(Republic of) Korea	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects.
Russia	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. — Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty.

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Table 7 *(continued)*

United Kingdom	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. — Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty.
USA	— Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects. — Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty. — Deaths and injuries… acute fire effects: Scope of NFIRS includes all injuries, deaths, or exposures to fire service personnel, including casualties that occur in conjunction both with incident responses and with non-incident events such as station duties or training; similar scope for NFPA survey. — All on duty firefighter fatalities are captured in a separate firefighter fatality database maintained by the USFA, which claims essentially 100% coverage of the nation. This includes deaths temporally distant from the original incident. Note: there are other federal agencies and non-governmental organizations that collect and report various disparate fire loss data, that go beyond the scope of this survey.

8 Location of fire (Question 9)

8.1 Summary comments on location of fire

Nearly all countries collect data so as to distinguish the broad categories of locations used in the survey.

— Buildings

— Structures other than buildings (for example, bridge, tunnel)

— Vehicles

— Crops, commercial forests, or other outdoor vegetation areas for which the vegetation has commercial value

— Other outdoor locations with commercial value (for example, outdoor storage, recreational areas and tourism sites outside structures)

— Outdoor vegetation areas with no commercial value (for example, brush-lands in a developed area)

— Other outdoor locations with no value (for example, trash bins, loose rubbish).

Several countries also provided coding categories for identifying specific types of buildings and structures and for identifying specific rooms or areas within buildings.

8.2 Location of fire by country

Table 8A provides a summary of national responses on type of property where fire occurred, noting any breakdowns provided for residential properties and any deviation in reporting from the broad categories cited in the survey.

Table 8B provides specific types of buildings and structures, for building and structure fires, for countries that provided that detail in attachments to the survey. Canada provides many sub-categories shown in section B2 of *Canadian Code Structure on Fire Loss Statistics*, 2002 edition, accessible at http://www.ccfmfc.ca/pdfs/code_structure_2002.pdf. However, these categories are somewhat inconsistent with the categories provided on the survey. It is not clear whether the more detailed categories are still in use.

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Table 8C provides specific rooms or areas within buildings, for building and structure fires, for countries that provided that detail in attachments to the survey. Canada provides many sub-categories shown in section F1 of *Canadian Code Structure on Fire Loss Statistics*, 2002 edition, accessible at http://www.ccfmfc.ca/pdfs/code_structure_2002.pdf. It is not clear whether the more detailed categories are still in use.

Table 8A — Locations of fires based on survey responses, by country

Australia	Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories.
Canada	— Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories — All residential properties reported together but distinguished from other buildings — All buildings with private housing units reported together but distinguished from other buildings
China	China does not indicate that they collect data on properties other than buildings, other structures, and vehicles. Detailed breakdowns of residential properties are not included in reporting.
France	Undetermined.
Japan	Japan collects data on properties other than buildings such as vehicles, vessels, forest, aircraft. Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels and dormitories, are reported but distinguished from other buildings.
Kenya	Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories.
(Republic of) Korea	— Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories — All residential properties reported together but distinguished from other buildings — All buildings with private housing units reported together but distinguished from other buildings. Since the creation of the 3-degree location categories, all above distinction can be recognized.
Russia	Russia does not indicate that they collect data on properties other than buildings, other structures, and vehicles. Detailed breakdowns of residential properties are not included in reporting.
United Kingdom	The U.K. has 295 categories, including 21 dwelling categories (private residential), 18 other residential, and 160 non-residential buildings. The complete list can be downloaded from https://www.gov.uk/government/publications/incident-recording-system-for-fire-and-rescue-authorities.
USA	— Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories — All residential properties reported together but distinguished from other buildings — All buildings with private housing units reported together but distinguished from other buildings.

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Table 8B — Specific types of buildings and other structures, by country providing detailed attachment

Australia	**CLASS 1** Class 1a - a detached house Class 1a - (i) one or more attached dwellings, each being a building, separated by a fire-resisting wall, including a row house, terrace house, town house or villa unit; or (ii) two attached dwellings, neither of which is located above the other or above or below another Class of building other than its appurtenant private garage Class 1b - (i) a boarding house, guest house, hostel or the like with a total floor area not exceeding 300 m^2 and in which not more than 12 persons would ordinarily be resident which is not located above or below another dwelling or another Class of building other than a private garage; or (ii) a boarding house, guest house, hostel or the like with a total floor area not exceeding 300 m^2 in which not more than 12 persons would ordinarily be resident, which is not located above or below another Class or building other than a private garage **CLASS 2** A building containing 2 or more sole-occupancy units each being a separate dwelling Class 2 **CLASS 3** A residential building, other than a building of Class 1 or 2, which is a common place of long term or transient living for a number of unrelated persons A boarding house, guest house, hostel, lodging house or backpackers accommodation A residential part of an hotel or motel A residential part of a school Accommodation for the aged, disabled or children A residential part of a health care building which accommodates members of staff A residential part of a Detention Centre for the accommodation of the inmates of the center **CLASS 4** A dwelling in a building that is Class 5,6,7,8 or 9 if it is the only dwelling in the building **CLASS 5** An office building used for professional or commercial purposes excluding buildings of Class 6,7,8 or 9

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Table 8B *(continued)*

Australia	**CLASS 6** A shop or other building for the sale of goods by retail or the supply of services direct to the public An eating room, cafe, restaurant, milk or soft drink bar A dining room, bar, shop or kiosk part of a hotel or motel A hairdressers or barbers shop, public laundry, or undertakers establishment A market or sale room, showroom, or service station **CLASS 7** A public car-park Storage, or display of goods or produce for sale by wholesale **CLASS 8** Factories, or a building in which a handicraft or process for the production, assembling, altering, repairing, packing, finishing, or cleaning of goods or produce is carried on for trade, sale or gain Laboratory other than in health care buildings **CLASS 9** A health care building, including those parts of the building set aside as a laboratory An assembly building, including a trade workshop laboratory or the like in primary or secondary school, but excluding any other parts of the building that are of another Class **A non-habitable building or structure:** Class 10a - a non habitable building being a private garage, carport or shed Class 10b - a structure being a fence, mast, antenna, retaining or free-standing wall, or swimming pool

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Table 8B *(continued)*

Canada	Assembly use: — Auditorium, theatre, arena, cultural center (7 sub-categories) — Amusement park, exhibition and fair ground, stadium (9 sub-categories) — Educational institution (Non residential) — Church, funeral parlor — Recreation, sports facilities, sports club, social club — Food and beverage establishment Institutional use: — Prison, penitentiary, jail, detention center, correctional facility, reformatory — Hospital, medical center, clinic, sanatorium Residential use: — Residential – row, garden, town housing, condominium — Residential – apartment, tenement — Hotel, motel, lodge, hostel, boarding house, dormitory — Residential – single detached — Residential – duplex, 3-plex, 4-plex, semi-detached — Educational Institution (residential) — Camp site/RV park — Residential – mobile home/ trailer park — Residential- with business/mercantile, up to 3 stories Business use: — Office building Mercantile use: — Commercial center including fuel dispensing (may include restaurant, stores, etc.) — Commercial center, shopping center — Department store, variety store Manufacturing store: — Industrial manufacturing

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Table 8B *(continued)*

Canada	Storage use: — Grain elevator — Industrial storage facility, bulk storage tanks Other special use: — Parks (federal, provincial or city) (includes history sites) — Motor vehicle transportation use (includes bus terminal) — Harbor, waterfront property, marine terminal — Railway terminal, yard (excludes subway) — Car park — Air transportation use — Subway — Property occupies its own building, structure or facility (excludes residential) — Laboratory — Farm, agricultural use — Multiple use (no overriding use) — Utility — Mine — Communications — Nucleonic complex — Not applicable Miscellaneous unknown: — Undetermined — Building/structure unclassified
Japan	Japan records the classification of occupancy in regard to regulation; there are 32 categories (see Annex C). They also record the type of use and the type of business of the building of origin, in three-digit and four-digit coding numbers, respectively; Japan considered those categories too numerous to include in this report.
(Republic of) Korea	Korea indicates on their survey form that they have 370 more specific categories.

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Table 8B *(continued)*

Russia	— Industrial building — Storage buildings — Open storage places materials, and other agricultural lands open area — Residential buildings and outbuildings — Under construction buildings — Construction, plants for industrial use — Vehicles — Buildings, construction and premises business trade — Building, room training and educational purpose — Building, room of health and social services of the population — Building, room service population — Administrative building — Buildings and rooms for temporary stay people — Other public building — Unexploited building — Clothes on a person — Other objects of fire

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Table 8B *(continued)*

USA	**Assembly**
	— Bowling establishment
	— Billiard center or pool hall
	— Electronic amusement center
	— Ice rink
	— Roller rink
	— Swimming facility
	— Other fixed-use recreation place
	— Ballroom or gymnasium
	— Convention center or exhibit hall
	— Stadium or arena
	— Playground
	— Amusement center
	— Other variable-use recreation place
	— Place of worship
	— Funeral parlor
	— Other place of worship or funeral parlor
	— Athletic or health club
	— Clubhouse
	— Yacht club
	— Casino
	— Other club
	— Library
	— Museum
	— Memorial structure
	— Courthouse
	— Other public or government
	— Restaurant or cafeteria
	— Bar, nightclub, tavern, pub
	— Other eating or drinking place

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Table 8B *(continued)*

USA	— Airport passenger terminal — Bus station — Rapid transit station — Other passenger terminal — Live performance theatre — Auditorium or concert hall — Movie theatre — Radio or television studio — Film/movie production studio — Other studio or theatre — Other assembly **Educational** — Preschool — Elementary school — High school, junior high school, middle school — Other non-adult school — Adult education center, college classroom — Day care in commercial property — Day care in residence, licensed — Day care in residence, unlicensed — Other educational **Health care or correctional** — Licensed nursing home — Mental retardation/development disability facility — Alcohol or substance abuse recovery center — Asylum or mental institution — Hospital — Hospice — Clinic — Doctor or dentist office

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Table 8B *(continued)*

USA	— Hemodialysis unit
	— Other clinic or doctor's office
	— Jail or prison
	— Reformatory
	— Police station
	— Other health care or correctional
	Residential
	— One- or two-family dwelling, including manufactured home
	— Multi-family dwelling
	— Boarding or rooming house
	— Hotel or motel
	— Residential board and care
	— Dormitory
	— Sorority or fraternity house
	— Barracks
	— Other residential
	Mercantile or business
	— Convenience store
	— Food and beverage sales
	— Textile, wearing apparel sales
	— Households goods sales, repairs
	— Specialty shop
	— Personal service
	— Recreational store
	— Laundry, dry cleaning
	— Professional supplies, service
	— Service station, gas station
	— Motor vehicle or boat sales, service, repair
	— Department store
	— Other general retail

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Table 8B *(continued)*

USA	— Bank
	— Office, veterinary or research
	— Post office
	— Business office
	— Other mercantile or business
	Industrial, utility, defense, agriculture, mining
	— Steam or heat generating plant
	— Electric generating plant
	— Other energy production plant
	— Laboratory
	— Defense or military installation
	— Computer center
	— Communications center
	— Electrical distribution
	— Gas distribution or pipeline
	— Flammable liquid distribution system
	— Water utility
	— Sanitation utility
	— Other utility or distribution system
	— Crops or orchard
	— Livestock production
	— Forest, timberland, or woodland
	— Mine or quarry
	— Other industrial, utility, defense, agriculture, mining
	Manufacturing
	— Manufacturing or processing

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Table 8B *(continued)*

USA	**Storage** — Outside material storage — Outbuilding or shed — Grain elevator or silo — Livestock or poultry storage — Refrigerated storage — Outside storage tank — Other vehicle storage — Detached dwelling garage — General parking garage — Fire station — Warehouse — Dock, marina, pier, wharf — Residential or self-storage — Other storage **Outside or special property** — Dump or landfill — Bridge or trestle — Tunnel — Outbuilding or protective shelter And over 20 additional categories not for buildings, other structures or vehicles — Other property use — None — Undetermined

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Table 8C — Specific types of rooms and other areas, by country providing detailed attachment

Australia	**Means of Egress** — Hallway, corridor, mall — Exterior stairway, including fire escapes and exterior ramps — Interior stairway, including interior ramps — Escalator — Lobby, entrance way — Fire-isolated escape route — Means of egress not classified above **Assembly or Sales Areas** — Large assembly areas with fixed seats (100 or more persons). — Large open room without fixed seats (100 or more persons). — Small assembly area with or without fixed seats (less than 100 persons). — Lounge area, including living rooms, common rooms, dens, recreation rooms, family rooms. — Sales, show-room area. — Library. — Swimming pools — Assembly, sales areas not classified above — Assembly, sales area with insufficient information available to classify further **Functional Areas** — Sleeping room for under five persons, including patient rooms, bedrooms, cells — Sleeping area for five or more persons. — Dining area, lunchroom, cafeteria. — Kitchen, cooking area. — Lavatory, locker room, cloakroom. — Laundry room, area. — Office — Personal service area — Laboratory — Printing or photographic room, area

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Table 8C *(continued)*

Australia	— First aid, treatment room. — Operating room. — Electronic equipment room/area. — Performance, stage area. — Projection room, area. — Process, manufacturing area — Functional areas not classified above — Functional areas insufficient information available to classify further **Storage Areas** — Product storage room or area, storage tanks, storage bin. — Closet and small storage area — Supply storage room or area. — Records storage room, vault — Shipping, receiving, loading area, loading dock. — Waste or rubbish area, container. — Garage, carport, vehicle storage area — Storage areas not classified above — Storage areas; insufficient information available to classify further **Service Facilities** — Lift, dumbwaiter. — Utility shaft. — Light shaft — Chute. — Duct. — Display window — Chimney/flue. — Conveyor — Service facilities not classified above — Service facilities with insufficient information to classify further

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Table 8C *(continued)*

Australia	**Service, Equipment Areas** — Machinery room/area. — Heating equipment room or area, water heater area — Switchgear area, transformer vault, switchboard — Incinerator room/area. — Maintenance shop/area. — Test cell (a testing area or unit that simulates a condition) — Enclosure with pressurized air — Enclosure with enriched oxygen atmosphere — Service, equipment areas not classified above — Service, equipment areas; insufficient information available to classify further **Structural Areas** — Crawl space, substructure space — Exterior balcony, open porch or veranda — Ceiling and floor assembly, concealed floor/ceiling space — Ceiling and roof assembly, concealed roof/ceiling space — Wall assembly, concealed wall space — Exterior wall surface — Exterior roof surface — Awning — Structural areas not classified above — Structural areas; insufficient information available to classify further Other areas are specified for vehicles and for outdoor locations
Japan	Japan records types of rooms and other areas, in 164 categories (see Annex C).

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Table 8C *(continued)*

United Kingdom	**For Dwellings** — Airing/drying cupboard — Bathroom/toilet — Bedroom — Bedsitting room — Chimney — Conservatory — Corridor/hall — Dining room — External fittings — External structures — Garage — Indoor swimming pool — Kitchen — Lift/lift shaft/motor room — Living room — Refuse store — Roof space — Roof — Sauna — Stairs — Under stairs (enclosed storage area) — Utility room — Open plan area — Other — Not known

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Table 8C *(continued)*

United Kingdom	**For Other Residential** — Airing/drying cupboard — Bar/canteen/restaurant/mess — Bathroom/toilet — Bedroom — Bedsitting room — Boiler room — Cell — Chimney — Class room — Cloakroom — Common room/staff room/day room — Conservatory — Corridor/hall — Dining room — Dormitory — External fittings — External structures — Garage — Indoor swimming pool — Kitchen — Laundry room — Lift/lift shaft/motor room — Meeting room — Office — Power house/plant/generator — Reception area — Refuse store — Roof space — Roof

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Table 8C *(continued)*

United Kingdom	— Sauna — Stairs — Store room — Under stairs (enclosed storage area) — Utility room — Ward/sick bay — Other — Not known **For Non Residential Building** — Barn — Bathroom/toilet — Boiler room — Canteen/restaurant — Chimney — Cloakroom — Conservatory — Corridor/hall — External fittings — External structures — Garage — IT server/mainframe room — Kitchen — Lift/lift shaft/motor room — Meeting room — Office — Parking garage — Power house/plant/generator — Process/production room — Reception area — Refuse store — Roof space — Roof — Shop floor/showroom/display hall — Stairs — Store room — Under stairs (enclosed storage area) — Utility room — Other — Not known Other areas are specified for each of several types of vehicles.

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Table 8C *(continued)*

USA	**Means of Egress**
	— Hallway or corridor
	— Exterior stairway
	— Interior stairway
	— Escalator
	— Lobby
	— Other egress/exit
	Assembly or Sales Area
	— Assembly area with fixed seats for 100 or more people
	— Assembly area without fixed seats for 100 or more people
	— Assembly area for less than 100 people
	— Common room, den, family room, living room, lounge, sitting room
	— Sales area or showroom
	— Art gallery, exhibit hall, library
	— Swimming pool
	— Other assembly or sales area
	Function Area
	— Bedroom for fewer than five people
	— Bedroom for five or more people
	— Dining room, bar, cafeteria
	— Kitchen or cooking area
	— Bathroom, checkroom, lavatory, locker room
	— Laundry area
	— Office
	— Personal service area
	— Other function area

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Table 8C *(continued)*

USA	**Technical Processing Area** — Laboratory — Photography area — First-aid area — Operating room — Computer room — Performance or stage area — Projection room — Processing or manufacturing area — Other technical processing area **Storage Area** — Storage room, area, tank or bin — Closet — Tool or supply storage — Records storage — Shipping or receiving area — Trash chute — Garage — Other storage area **Service Area** — Elevator shaft — Conduit, pipe, utility, or ventilation shaft — Light shaft — Laundry or mail chute — Duct — Display window — Conveyor — Other service area

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Table 8C *(continued)*

USA	**Service or Equipment Area** — Machinery room or area — Heating room or area — Switchgear area or transformer vault — Incinerator area — Maintenance shop or area — Test cell — Pressurized air enclosure — Enclosure with enriched oxygen atmosphere — Other service or equipment area **Structural Area** — Crawl space or substructure area — Exterior balcony — Ceiling/floor assembly or space between stories — Attic or concealed roof/ceiling space — Wall assembly or concealed wall space — Exterior wall surface — Exterior roof surface — Awning — Other structural area **Vehicle Area – 7 areas not shown here** **Outside Area – 9 areas not shown here** — Other area of origin — Undetermined

9 Type of construction (Question 11b/first entry)

9.1 Summary comments on type of construction

Most countries collect information on type of construction.

9.2 Recording of type of construction, by country

Table 9 provides a summary of national responses on reporting on type of construction.

Table 9 — Reporting of type of construction by country

Australia	Need clarification. Survey says this is included in reporting and refers reader to attachment, but attachment has no details on type of construction.

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Table 9 *(continued)*

Canada	Yes, included in reporting. **General Construction** — Combustible Construction - open wood joist — Protected Combustible Construction - wood protected by plaster — Heavy Timber Construction — Non-Combustible Construction - exposed steel — Protected Non-Combustible Construction - protected steel or concrete — General Construction - not applicable — General Construction - unclassified Possibly relevant when used in combination with the general construction codes would be the reporting of **year of construction**, because specific requirements, materials, and methods of construction might be correlated with different periods in recent history. **Method of Construction** — Stick Built – Constructed On Site — Manufactured – Assembled/Placed On Site
China	No, not included in reporting.
France	Undetermined
Japan	Yes, using these categories: — Wooden construction — Fire proof wooden construction such as mortar covered — Quasi-fire resistant construction (Wooden) — Quasi-fire resistant construction (Non wooden) — Fire resistant construction — Others
Kenya	No, not included in reporting.
(Republic of) Korea	Yes, there is reporting on 19 different types of construction. No information on details.
Russia	Yes, there is reporting on Fire Resistance Rating. No information on details.

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Table 9 *(continued)*

United Kingdom	Yes, some information included in reporting. Not clear whether the question on deviations from "traditional" construction (brick and slate cited as examples) is the only relevant item in the database. Question 8.18 reports the principal "special" building construction involved. — None — Timber framed — Cladding — Sandwich panels — Atria — Thatch — Large single storey retail premises — Other (such as wattle and daub, complex/unusual layout/escape routes, large underground areas)
USA	No, not included in reporting since 1999. Type of construction was included in fire incident reporting during 1980-1998 with these codes. Definitions are made more specific by reference to the categories of construction defined by model building codes of the time: — Fire resistive — Heavy timber — Protected noncombustible or some type of limited combustible — Unprotected noncombustible or the other types of limited combustible — Protected ordinary — Unprotected ordinary — Protected wood frame — Unprotected wood frame — Unclassified — Unknown

10 Other fire characteristics (Question 14)

10.1 Summary comments on selected other fire characteristics

Many countries collect information on one or more of the other fire characteristics addressed by Question 14.

10.2 Recording of building height and other building characteristics, by country

Table 10 provides a summary of national responses on reporting on these other fire characteristics.

Table 10 — Reporting on building height and other building characteristics, by country

Australia	— Level or floor where fire began — Structure status, such as vacant, under construction, or under demolition — Age of building

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Table 10 *(continued)*

Canada	— Height of building — Level or floor where fire began — Structure status, such as vacant, under construction, or under demolition — Age of building
China	— Height of building. In China, there are 4 groups: high-rise, underground, multi-floor. In China, the following buildings are classified as high-rises: residential (more than 10 stories and 10 stories) and other buildings ≥24m. Building height means the height from the ground outside of the building to its cornice or roof surface layer. — Construction usage (industrial, agriculture, residential and public-purpose) — Construction structure (timber structure, brick and concrete structure, steel structure and so on) — Fire resistance rating.
France	Undetermined
Japan	— Height of building. Number of floors above and below the ground level of the building. — Level or floor where fire began
Kenya	Not included in reporting
(Republic of) Korea	— Level or floor where fire began — Structure status, such as vacant, under construction, or under demolition
Russia	— Height of building — Level or floor where fire began — Type of company occupying building, such as retail vs. wholesale, a distinguished from primary use of the building, such as sales vs. manufacturing vs. storage
United Kingdom	— Number of stories — Level or floor where fire began. Floor 0 = ground floor. — Structure status, such as vacant, under construction, or under demolition. Under “Is the building normally occupied?”, there are these choices: - Yes – occupied - No – unoccupied permanently (vacant) - No – under construction
USA	— Height of building. Stories at or above grade / Stories below grade — Level or floor where fire began — Structure status, such as vacant, under construction, or under demolition.

11 Deliberately set fires and playing with fire (Questions 10a/first entry, 10b, and 10c/first entry)

11.1 Summary comments on estimation of deliberate fires and fireplay fires

Most countries collect information on deliberately set fires. Countries use different approaches to develop what they consider the best estimate of the size of the arson fire (or deliberate fire) problem in their country, which may include any or all of the following:

— Use of “suspicious” as a recognized choice for cause,

— Proportional allocation of fires with unknown cause or fires still under investigation,

— Relative use or non-use of trained arson investigators to declare a fire to be deliberate, and

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— Inclusion or exclusion of fires determined to have been set without malicious intent (usually called "playing with fire").

Several countries identify intentional fires set during or as part of a riot or social disturbance. Some countries can separate juvenile firesetting, both fires coded as playing with fire and intentionally set fires where the fire was set by someone young enough to qualify as juvenile under local laws or conventions. Only the U.S.A. reported a more elaborate and detailed reporting of arson motives, and this reporting is only incorporated in the separate Arson Module of NFIRS, a module which is voluntary and often not completed.

The United Kingdom was the only country to incorporate designations of homicide and suicide into its reporting categories for deliberate fires. However, all countries participate in the international standard for coding of vital records, which includes separate codes for homicide by fire and suicide by fire. This source of data can be used by any country and will capture fire deaths that were not part of a fire attended by a fire brigade and so not reportable to the country's national fire incident databases. Suicide by fire is a major cause of death in some countries. The death certificate database lacks any other details regarding the circumstances of the intentional fire, although it will include a number of details about the victim.

11.2 Recording of deliberate fires and fireplay incidents, by country

Table 11 provides a summary of national responses on reporting and estimating of deliberate fires.

The survey did not request information on other databases which may collect information and estimate the arson fire problem using other data sources and methods. It is known that some countries have separate estimates developed by the insurance industry, and some countries have separate estimates developed by law enforcement from police reports. Some countries also incorporate information from insurance sources or police sources in developing their fire-department-based data bases, as is documented below.

Table 11 — Reporting and estimation of deliberately set fires by country

Australia	Yes, recorded as "incendiary" and "suspicious" as choices under Ignition Factor. All four loss measures reported. Classification as deliberate – no information on who provides classifications; presumably Australia practices cited in 1.2 apply here as well. No mention of use of unknown cause fires in estimates Reporting of fireplay, and no fires are categorized as both deliberate and fireplay; fireplay incidents are subdivided by age of person starting fire – 5 and under, 6 to 12, 13 to 16; no provision for fireplay but persons older than 16. Intentional fires are categorized as to motive or circumstances. — During social disturbance — Not during social disturbance

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Table 11 *(continued)*

Canada	Yes, recorded under Act or Omission using any of following categories — Incendiary — Suspicious — Incendiary/riot or civil disturbance — Incendiary/unclassified — Incendiary/additional details unknown The last three categories presumably include incendiary and suspicious fires. All four loss measures reported as well as fire brigade deaths and injuries Classification as deliberate – some by trained arson investigators, some by insurance investigators or other insurance personnel Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation Reporting of fireplay, and no fires are categorized as both deliberate and fireplay, but practices appear to vary from province to province, based on last national statistics report published (2007). Ages are distinguished as — 11 or younger — 12 to 17 — 18 or older — Playing but age unknown The same age breakdowns can be reported for incendiary fires and for suspicious fires. Intentional fires are categorized as to motive or circumstances. — Arson for profit (reported in survey but not clear in 2002 coding manual where or how this point is covered) — Arson during riot or social disturbance — Arson by juveniles (children).
China	Yes, no information provided on how such fires are labeled or distinguished No mention of four loss measures but do collect data on fire brigade deaths and injuries Classification as deliberate – some by trained arson investigators Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation No mention of use of unknown cause fires in estimates No mention of reporting of fireplay No mention of reporting of motives
France	No
Japan	Yes, recorded as “incendiary”, “suspicious”, “fireplay”, and “other intentional firesetting” as choices under Causing Process All four loss measures reported, as well as fire brigade deaths and injuries Classification as deliberate – some by fire officers on scene with no arson training but some other cases by police officers Unknown causes are recorded separately in estimates. There is no information on motives in a fire incident report.

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Table 11 *(continued)*

Kenya	Yes; estimates include suspicious fires, which may not be coded separately No information on which loss measures are reported Classification as deliberate – some by trained arson investigators, some by fire officers on the scene with no arson training, some by police or other law enforcement personnel, some by insurance investigators or other insurance personnel Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation No fires are categorized as both deliberate and fireplay, but not clear whether fireplay is coded at all Intentional fires are categorized as to motive or circumstances. — Arson for profit — Arson during riot or social disturbance
(Republic of) Korea	Yes, recorded as "arson" or "arson suspicious" as a choice under Fire Cause Category 1; estimates do not include suspicious fires All four loss measures reported Classification as deliberate – some by fire officers on the scene with no arson training Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation Reporting of fireplay, and no fires are categorized as both deliberate and fireplay. No mention of reporting of motives
Russia	Undetermined – choices for coding as fire cause not provided
United Kingdom	Yes (under Question 5.15 – Cause/Motive) reported as "Deliberate – own property", "Deliberate – other's property" and "Deliberate – unknown owner". Also (under Question 8.1 – Cause of the fire), each of three types of deliberate fire is subdivided as to — Bomb or incendiary device — Suicide (including attempted suicide): setting fire to self — Homicide (including attempted homicide): setting fire to other person — Heat source and combustibles brought together deliberately All four loss measures reported as well as fire brigade deaths and injuries Classification as deliberate – some by trained arson investigators, some by fire officers on the scene with no arson training Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation Reporting of fireplay (under Question 8.1 – Cause of the fire) as Accidental – Playing with fire, and no fires are categorized as both deliberate and fireplay. Coding manual emphasizes that there are no presumptions about age of firesetter. Other information relevant to motive (under Question 8.3 – Caused by) can be used to isolate juvenile firesetters: — Child (age 9 or younger) — Youth (age 10-17) — Adult (age 18-64) — Elderly (age 65 or more) — Age not known

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Table 11 *(continued)*

USA	Yes (under Cause of Ignition) reported as "Intentional". All four loss measures reported as well as fire department deaths and injuries Classification as deliberate – some by trained arson investigators, some by fire officers on the scene with no arson training, some by police or other law enforcement personnel (through separate database, Federal Bureau of Investigation's Uniform Crime Reports), some by insurance investigators or other insurance personnel Statistical analysis of deliberate fires includes some fires with unknown cause or cause still under investigation Reporting of fireplay (under Factor Contributing to Ignition) and fires can be categorized as both intentional and fireplay. Under Human Factor Contributing to Ignition, can check "Age was a factor" and then age of person can be entered but is often left blank. — Optional Arson Module offers data elements to report on: — Case status (for example, open, closed, inactive) — Availability of material first ignited (refers to whether fire-starting materials were available at scene or transported to scene) — Suspected motivation factors (see details below) — Apparent group involvement (including gangs, organized crime, hate groups) — Entry method (how the firesetter entered the property) — Extent of fire involvement on arrival of fire department — Type of incendiary device used, if any — Other investigative information (including code violations, other indicators of vulnerability of property, possible motives for fraud, evidence of other criminal activity on site) — Property ownership — Initial observations (including status of doors and windows) — Laboratory used (for analysis of evidence) — Characteristics of subject (for juvenile firesetters), including age, gender, race, ethnicity, family type, motivation (see below), disposition of case

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Table 11 *(continued)*

USA	Suspected motivation factors (not limited to juvenile firesetters) — Extortion — Labor unrest — Insurance fraud — Intimidation — Void contract or lease — Personal — Hate crime — Institutional — Societal — Protest — Civil unrest — Fireplay or curiosity — Vanity or recognition — Thrills — Attention or sympathy — Sexual excitement — Homicide — Suicide — Domestic violence — Burglary — Homicide concealment — Burglary concealment — Automobile theft concealment — Destroy records or evidence — Other suspected motivation — Unknown motivation Suspected motivation or risk factors (limited to juvenile firesetters) — Mild curiosity about fire — Moderate curiosity about fire — Extreme curiosity about fire — Diagnosed or suspected attention deficit (hyperactivity) disorder — History of trouble outside school — History of stealing or shoplifting — History of physically assaulting others — History of fireplay or firesetting — Transiency — Other — Unknown

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12 Natural cause (Questions 10a/second entry)

12.1 Summary comments on estimation of natural cause fires

Most countries collect information on natural cause fires. Only Australia and the U.S. reported subdividing natural cause fires into more specific types.

12.2 Recording of natural cause fires, by country

Table 12 provides a summary of national responses on reporting and estimating of natural cause fires.

Table 12 — Reporting and estimation of natural cause fires by country

Australia	Yes, recorded as any of six choices under Ignition Factor: — High wind — Earthquake — High water, including floods — Lightning — Unclassified natural condition or event — Unknown-type natural condition or event
Canada	Yes. Details appear to be limited to a coding entry for lightning under Fuel or Energy Associated with Igniting Object
China	Yes, no further information on how recorded
France	Undetermined
Japan	Yes, reported as any of five choices under Causing Process — Earthquake — Strong wind — Flood — Lightning — Unclassified natural condition or event
Kenya	Yes, no further information on how recorded
(Republic of) Korea	Yes, no detailed breakdowns reported
Russia	Yes, included in reporting — Lightning

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Table 12 *(continued)*

United Kingdom	Yes, reported as "Accidental/Natural occurrence" under Question 8.1, Cause of the fire, and as "Natural occurrence" under Question 8.4, Main source of ignition. No detailed breakdowns reported.
USA	Yes, recorded as "Act of nature" under Cause of Ignition. Also, recorded as any of seven choices under Factor Contributing to Ignition: — High wind — Storm — High water, including floods — Earthquake — Volcanic action — Animal — "Other" (unclassified or unknown-type) natural condition Additional details may be provided in the Chemical or Natural Heat Source section under Heat Source: — Sunlight — Spontaneous combustion or chemical reaction — Lightning discharge — Other static discharge — Other (unclassified or unknown-type) chemical or natural heat source "Sunlight" and "lightning discharge" are clearly natural causes and are not identified under any other data element. "Spontaneous combustion or chemical reaction" and "other static discharge" can arise from natural or other causes and so would not be sufficient by themselves to designate a fire as natural, although they would provide additional detail for a fire designated as natural under Cause or Factor Contributing to Ignition.

13 Exposure (Questions 10a/third entry)

13.1 Summary comments on estimation of exposure fires

Most countries collect information on exposure fires. Only Australia, Canada and the U.S. reported subdividing exposure fires into more specific types, but there is some question whether Canada's more detailed reporting is in current use.

13.2 Recording of exposure fires, by country

Table 13 provides a summary of national responses on reporting and estimating of exposure fires.

Table 13 — Reporting and estimation of exposure fires by country

Australia	Yes, recorded as any of five choices under Ignition Factor: — Separate, removed exposure, at least 18m distance — Separate, detached exposure, more than 200mm but less than 18m distance — Separate, adjoining exposure, less than 300mm distance or separated by an unpierced wall — Attached, protected exposure — Attached, unprotected exposure

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Table 13 *(continued)*

Canada	Yes, recorded as any of the following choices under Igniting Object — Structure attached — Structure detached — Lumber yard — Outside storage container or tank — "Open" fire — Forest or trees — Grass, shrub, brush or scrub — Vehicle — Unclassified or unknown
China	Yes, no further information on how recorded
France	Undetermined
Japan	Yes, no further information on how recorded
Kenya	Yes, no further information on how recorded
(Republic of) Korea	Yes, no detailed breakdowns reported
Russia	Not included in reporting
United Kingdom	Yes, reported as "Spread from secondary fire" under Question 8.4, Main source of ignition. No detailed breakdowns reported.
USA	Yes, recorded in three places. First, can be reported as Exposure Number greater than zero. Second, can be reported with any of five choices for mechanism of heat transfer from another fire under Heat Source: — Direct flame or convection currents — Radiated heat — Flying brand, ember or spark — Conducted heat — Other (unclassified or unknown-type) Also, recorded as one of the six choices in the Fire Spread or Control section of Factor Contributing to Ignition, but this is difficult to interpret because another of the six choices in the same section is "Other (unclassified or unknown type) fire spread or control" which could mean some exposure fires and some other fires.

14 Heat sources – Cigarettes and other smoking materials, including lighting implements (Questions 10a/third entry and 10c/second, third, thirteenth and fourteenth entries)

14.1 Summary comments on estimation of fires started by cigarettes or other smoking materials, including lighting implements

Most countries collect information on smoking material or open flame fires, but there are usually partially specified categories (which could be either smoking material or open flame) that make it difficult to estimate the two separately. Also, while all countries coding open flame fires include matches, lighters,

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and candles, there are other open flame categories that are included by some countries but not others or that some countries treat as equipment rather than open flame heat source:

— various types of torches,

— open fires,

— torches used for lighting,

— lamp or lantern excluding electric,

— ash or ember or ashtray contents,

— novelty lighter,

— charcoal or utility lighter,

— oil or incense burner,

— naked flame,

— warning or road flare, and

— backfire from an internal combustion engine.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report and Canada's is taken from a decade-old coding manual; there is some question whether Australia's or Canada's more detailed reporting, which in both cases is based on an older edition of the USA's NFIRS, is in current use.

14.2 Recording of cigarette or other smoking material or lighting implement fires, by country

Table 14 provides a summary of national responses on reporting and estimating of cigarette and other smoking material fires.

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Table 14 — Reporting and estimation of smoking material and open flame fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Heat Source, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Form of Heat of Ignition had 10 relevant choices with 4 partially undefined categories and one irrelevant choice linked to some of the partially undefined categories (backfire): — Cigarette — Cigar — Pipe — Smoking material, unclassified — Smoking material, unknown type — Cutting torch — Welding torch — Torch other than cutting or welding — Candle or taper — Match — Lighter — Open fire — Backfire from internal combustion engine — Open flame or spark, unclassified — Open flame or spark, unknown type This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.
Canada	Yes, recorded as any of the following choices under Igniting Object — Cigarette — Pipe (contents) — Cigar — Ashtray (contents) — Match used as lighting implement — Lighter used as lighting implement — Smoker's material of unknown type — Match not used as smoker's implement — Lighter not used as smoker's implement — Match or lighter (not clear which) not used as smoker's implement — Lamp or lantern (not electric) — Candle or taper — Cutting torch — Welding torch — Torch other than cutting or welding — Hot ash or ember — Unclassified or unknown type smoker's material or open flame These coding choices include a number of categories that cannot be confidently allocated to smoking materials versus open flames.

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Table 14 *(continued)*

China	Unclear. Not checked on survey and details were not separately provided although Heat Source is recorded
France	Undetermined
Japan	Yes, smoking material and open flame were checked on survey. Survey did not request details and they were not separately provided although Heat Source is recorded
Kenya	Unclear. Not checked on survey and details were not separately provided although Heat Source is recorded
(Republic of) Korea	Yes, smoking material and open flame were checked on survey. Survey did not request details and they were not separately provided although Heat Source is recorded
Russia	Yes. — Cigarette — Match — Lighter — Candle
United Kingdom	Yes, can be reported under Main Source of Ignition: — Match — Candle — Cigarette lighter — Smoking materials, including cigarettes, cigars and tobacco — Oil or incense burners (listed under “Smoking Related” but not listed with smoking materials for any other country and can be analyzed separately) — Welding or cutting equipment (listed under “Industrial Equipment”; grouped with open flame heat source for some countries but not others) — Naked flame
USA	Yes, can be reported with any of five choices for mechanism of heat transfer from another fire in the Other Open Flame or Smoking Materials part of Heat Source: — Cigarette — Pipe or cigar — Undetermined smoking material — Match — Lighter — Candle — Warning or road flare — Backfire from internal combustion engine — Flame or torch used for lighting — Other (unclassified or unknown type) open flame or smoking material Also, “hot ember or ash” is a choice under the Hot or Smoldering Object part of Heat Source, as are several unrelated categories, all linked to “other (unclassified or unknown type) hot or smoldering object”. Torches are now choices under Equipment Involved in Ignition, as are “cigarette lighter,” “charcoal or utility lighter” and “novelty lighter”. There are four choices for torches: — Welding torch — Cutting torch — Burner — Soldering equipment

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15 Equipment involved in ignition – Heating and cooling equipment (Questions 10a/fifth entry and 10c/fourth and fifth entries)

15.1 Summary comments on estimation of fires involving heating or cooling equipment

Many countries collect information on heating equipment fires or on HVAC (heating, ventilation and air conditioning) equipment fires generally.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report and Canada's is taken from a decade-old coding manual; there is some question whether Australia's or Canada's more detailed reporting, which in Australia's case is based on an older edition of the USA's NFIRS, is in current use.

15.2 Recording of heating and cooling fires, by country

Table 15 provides a summary of national responses on reporting and estimating of heating and cooling equipment fires.

Table 15 — Reporting and estimation of heating and cooling equipment fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Equipment Involved in Ignition, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Equipment Involved in Ignition had 12 relevant choices and 2 partially relevant choices with 4 partially undefined categories and 2 possibly irrelevant choices linked to some of the partially undefined categories (water cooling device; fixed, stationary local refrigeration unit): — Central heating system — Water heater — Fixed, stationary local heating unit — Indoor fireplace — Portable local heating unit — Chimney or gas vent flue — Chimney or vent connector — Heat transfer system — Unclassified heating system — Unknown-type heating system — Fixed, stationary local air conditioning unit — Central air conditioning *or refrigeration* equipment — Portable air conditioning *or refrigeration* unit — Unclassified air conditioning or refrigeration equipment — Unknown type air conditioning or refrigeration equipment This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.

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Table 15 *(continued)*

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance or equipment not further specified) — Central heating unit — Water heater — Stationary space heater not further specified — Stationary space heater – wood stove — Portable space heater — Fireplace not further specified — Zero clearance fireplace — Fireplace (with) insert — Free-standing fireplace — Masonry or brick fireplace — Chimney not further specified — Factory built chimney — Masonry chimney — Metal chimney — Flue pipe or vent connector — Radiant heating system not further specified — Radiant heating system ceiling — Radiant heating system floor — Unclassified or unknown type heating equipment — Central air conditioning *or refrigeration* equipment (partially relevant) — Individual air conditioner or dehumidifier — Vehicle related heater not further specified — Vehicle related heater – interior — Vehicle related heater – block heater — Vehicle related heater – battery blanket — Sauna heater (under unclassified or unknown appliance or equipment) — Waterbed heater (under unclassified or unknown appliance or equipment) These coding choices include a number of categories that cannot be confidently allocated to smoking materials versus open flames.
China	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
France	Undetermined
Japan	Yes, heating equipment and all HVAC equipment were checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Kenya	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
(Republic of) Korea	Yes, heating equipment and all HVAC equipment were checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Russia	Not included in reporting

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Table 15 *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — Heater/Fire, including open fire — Patio heating equipment — Central heating/hot water — Other heating equipment — Separate water heating — Food warming equipment (not cooking); listed under heating equipment but would be analyzed with cooking equipment in some other countries — Chimney; also can be checked as a property having fire, separating such fires from all other fires in or on a building A separate data element records fuel or power source for equipment.

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Table 15 *(continued)*

USA	Yes, can be reported with any of 26 choices under Equipment Involved in Ignition: — Air conditioner — Heat pump — Fan — Humidifier — Ionizer — Portable dehumidifier — Evaporative cooler or cooling tower — Masonry fireplace — Factory built fireplace — Fireplace with insert — Heating stove — Chimney or vent connector — Brick, stone or masonry chimney — Metal chimney — Other (unclassified or unknown type) fireplace or chimney — Local built-in furnace or heating unit — Furnace or other central heating unit — Boiler — Heater, including floor furnace, wall heater and baseboard heater, excluding two types of heaters listed immediately below (also excludes hot water heater) — Catalytic heater — Oil-filled heater — Heat lamp — Heat tape — Water heater — Steam line, heat pipe, or hot air duct — Unclassified or unknown type heating, ventilation or air conditioning equipment Other data elements record fuel or power source and portability. Fires can be reported as any of six specific types of confined fires – for which much less detailed reporting is permitted – and two of the six refer to types of heating equipment (fuel burner or boiler, chimney or flue).

16 Equipment involved in ignition – Cooking and other kitchen equipment (Questions 10a/fifth entry and 10c/sixth and seventh entries)

16.1 Summary comments on estimation of fires involving cooking or other kitchen equipment

Many countries collect information on cooking equipment fires or on kitchen equipment fires generally.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report and Canada's is taken from a decade-old coding manual; there is some question whether Australia's

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or Canada's more detailed reporting, which in Australia's case is based on an older edition of the USA's NFIRS, is in current use.

16.2 Recording of cooking and other kitchen equipment fires, by country

Table 16 provides a summary of national responses on reporting and estimating of cooking and other kitchen equipment fires.

Table 16 — Reporting and estimation of cooking and kitchen equipment fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Equipment Involved in Ignition, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Equipment Involved in Ignition had 10 relevant choices and 2 partially relevant choices with 4 partially undefined categories and 2 possibly irrelevant choices linked to some of the partially undefined categories (water cooling device; fixed, stationary local air conditioning unit): — Fixed, stationary surface cooking unit (such as stovetop) — Fixed, stationary oven — Fixed, stationary food warming appliance — Deep fat fryer — Portable cooking or warming unit — Open fired grill — Grease hood or duct — Unclassified cooking equipment — Unknown-type cooking equipment — Fixed, stationary local refrigeration unit — Central air conditioning *or refrigeration* equipment — Portable air conditioning *or refrigeration* unit — Unclassified air conditioning or refrigeration equipment — Unknown type air conditioning or refrigeration equipment This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.

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Table 16 *(continued)*

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance or equipment not further specified) — Stove or range – involving fire in pan — Stove or range – involving fire in pot used as a deep fat fryer — Stove or range – involving other circumstances — Oven or stove or range — Chafing dish or fondue — Deep fat fryer, separate appliance — Commercial cooking equipment – non-turbulent medium (older units) — Commercial cooking equipment – turbulent medium (new high efficiency units) — Domestic/household temperature controlled deep fat fryer — Smoker for meat, fish, etc. — Fry pan or grill not on stove — Other portable cooking unit, including hot plate and camp stove — Open fired broiler, fixed type — Open fired broiler, portable type, including barbecue — Portable food warming appliance, including steam table, warming drawer, warming table — Toaster or waffle iron — Electric kettle, coffee maker or urn — Microwave oven — Unclassified or unknown cooking equipment — Central air conditioning *or refrigeration* equipment (partially relevant) — Individual refrigeration unit, including refrigerator or freezer — Electric barbeque starter
China	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
France	Undetermined
Japan	Yes, cooking equipment (but not other kitchen equipment) were checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Kenya	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
(Republic of) Korea	Yes, cooking equipment and other kitchen equipment were checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Russia	Not included in reporting

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Table 16 *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — Cooker including oven — Ring or hot plate as separate appliance — Microwave oven — Grill or toaster — Barbecue — Camping stove — Deep fat fryer — Other cooking appliance — Refrigerator or freezer — Dishwasher — Electric kettle A separate data element records fuel or power source for equipment.

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Table 16 *(continued)*

USA	Yes, can be reported with any of 28 choices under Equipment Involved in Ignition: — Blender, juicer, food processor or mixer — Coffee grinder — Can opener — Knife — Knife sharpener — Coffee maker or teapot — Food warmer or hot plate — Kettle — Popcorn popper — Pressure cooker or canner — Slow cooker — Toaster, toaster oven, or countertop broiler — Waffle iron or griddle — Wok, frying pan or skillet — Bread-making machine — Deep fryer — Grill, hibachi or barbecue — Microwave oven — Oven or rotisserie — Range with or without oven — Steam table or warming drawer or table — Dishwasher — Freezer separate from refrigerator — Garbage disposer — Grease hood or duct exhaust fan — Ice maker separate from refrigerator — Refrigerator or combined refrigerator/freezer — Unclassified or unknown type kitchen or cooking equipment Other data elements record fuel or power source and portability. Fires can be reported as any of six specific types of confined fires – for which much less detailed reporting is permitted – and one of the six refer to types of cooking equipment (cooking vessel).

17 Equipment involved in ignition – Clothes dryer (Questions 10a/fifth entry and 10c/twelfth entry)

17.1 Summary comments on estimation of fires involving clothes dryers

Many countries collect information on clothes dryer fires generally.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report and Canada's is taken from a decade-old coding manual; there is some question whether Australia's

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or Canada's more detailed reporting, which in Australia's case is based on an older edition of the USA's NFIRS, is in current use.

17.2 Recording of clothes dryer fires, by country

Table 17 provides a summary of national responses on reporting and estimating of clothes dryer fires by country.

Table 17 — Reporting and estimation of clothes dryer fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Equipment Involved in Ignition, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Equipment Involved in Ignition had 2 relevant choices and 2 partially undefined categories and 7 irrelevant choices linked to the partially undefined categories (television or radio; floor care equipment; separate motor or generator; hand tool; portable appliance designed to produce controlled heat; portable appliance not designed to produced controlled heat): — Dryer — Washing machine — Unclassified appliance or equipment — Unknown type appliance or equipment This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.
Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance or equipment not further specified) — Clothes dryer — Washing machine
China	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
France	Undetermined
Japan	Yes, clothes dryer with or without washer is reported.
Kenya	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
(Republic of) Korea	Yes, clothes dryer with or without washer is reported.
Russia	Not included in reporting

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Table 17 *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — Washing machine — Tumble dryer — Spin dryer — Combined washer/dryer A separate data element records fuel or power source for equipment.
USA	Yes, can be reported with any of 3 choices under Equipment Involved in Ignition, which are linked along with many other choices to a partially specified choice (other (unclassified or unknown type) personal or household equipment): — Clothes dryer — Washer/dryer combination — Washing machine Other data elements record fuel or power source and portability.

18 Equipment involved in ignition – Entertainment equipment (Questions 10a/fifth entry and 10c/tenth entry)

18.1 Summary comments on estimation of fires involving entertainment equipment

Many countries collect information on entertainment equipment fires. The rapid changes in popular technologies mean that even the countries that provided extensive detail in coding choices are lagging behind popular usage. For example, there is no distinction of wall-mounted, high-definition or 3D televisions, or even of color versus black-and-white televisions.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report and Canada's is taken from a decade-old coding manual; there is some question whether Australia's or Canada's more detailed reporting, which in Australia's case is based on an older edition of the USA's NFIRS, is in current use.

18.2 Recording of entertainment equipment fires, by country

Table 18 provides a summary of national responses on reporting and estimating of entertainment equipment fires.

Table 18 — Reporting and estimation of entertainment equipment fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Equipment Involved in Ignition, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Equipment Involved in Ignition had 1 relevant choice and 2 partially undefined categories and 8 irrelevant choices linked to the partially undefined categories (dryer; washing machine; floor care equipment; separate motor or generator; hand tool; portable appliance designed to produce controlled heat; portable appliance not designed to produced controlled heat): — Television, radio, or phonograph — Unclassified appliance or equipment — Unknown type appliance or equipment This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.

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Table 18 *(continued)*

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance, unclassified or unknown electrical equipment, or equipment not further specified) — Television or computer monitor (partially relevant to entertainment equipment and partially relevant to office equipment) — Radio, stereo, phonograph, tape recorder, video cassette recorder — Video game equipment
China	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
France	Undetermined
Japan	Yes, entertainment equipment was checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Kenya	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
(Republic of) Korea	Yes, entertainment equipment was checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Russia	Not included in reporting

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Table 18 *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — Television — Audio equipment — Video/DVD — Other electrical visual equipment, including closed circuit television and satellite receivers A separate data element records fuel or power source for equipment.
USA	Yes, can be reported with any of 21 choices under Equipment Involved in Ignition, which are linked along with many other choices to a partially specified choice (other (unclassified or unknown type) electronic or other electrical equipment): — Guitar — Piano or organ — Musical synthesizer or keyboard — Other (unclassified or unknown type) musical instrument — Audio CD (compact disc) player — Laser disk player, including DVD player or recorder — Radio, excluding two-way radios — Two-way radio — Record player, phonograph, turntable — Audio speaker as separate components — Stereo equipment, including receivers, amplifiers, and equalizers — Tape recorder or player — Other (unclassified or unknown type) sound recording or receiving equipment — Cable converter box — Film, slider or overhead projector — Television (TV) — VCR (video cassette recorder) or VCR-TV combination — Electronic video game — Camcorder or video camera — Photographic camera and equipment — Other (unclassified or unknown type) video equipment Other data elements record fuel or power source and portability.

19 Equipment involved in ignition – Office equipment (Questions 10a/fifth entry and 10c/eleventh entry)

19.1 Summary comments on estimation of fires involving office equipment

Many countries collect information on office equipment fires. The rapid changes in popular technologies mean that even the countries that provided extensive detail in coding choices are lagging behind popular usage. For example, the different sizes of personal computers are not distinguished and smart phones (combination telephones and portable computers) are not mentioned.

The survey did not ask for details on coding categories, and only Australia, Canada, the United Kingdom, and the USA reported such details. Australia's detailed coding was taken from a 20-year-old report

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and Canada's is taken from a decade-old coding manual; there is some question whether Australia's or Canada's more detailed reporting, which in Australia's case is based on an older edition of the USA's NFIRS, is in current use.

19.2 Recording of office equipment fires, by country

Table 19 provides a summary of national responses on reporting and estimating of office equipment fires.

Table 19 — Reporting and estimation of office equipment fires by country

Australia	Unclear. The parts of the coding manual provided with the survey response do not provide details under Equipment Involved in Ignition, but an early 1990s report on Australian fire statistics, prepared by CSIRO, indicated that Equipment Involved in Ignition had 4 probably relevant choices and 2 partially undefined categories and 4 irrelevant choices linked to the partially undefined categories (biomedical device or equipment; separate pump or compressor; internal combustion engine; conveyor): — Electronic equipment — Vending machine or drinking fountain — Office machine — Unclassified special equipment — Unknown type special equipment This coding arrangement was modeled on the USA's NFIRS codes of the time, and NFIRS has since changed (see USA). It is not clear what the current coding choices are for this in Australia.
Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance, unclassified or unknown electrical equipment, or equipment not further specified) — Television or computer monitor (partially relevant to entertainment equipment and partially relevant to office equipment) — Electronic communications equipment — Electronic data processing equipment, including computers — Photocopier, facsimile machine, or computer printer
China	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
France	Undetermined
Japan	Yes, office equipment was checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Kenya	Unclear. Not checked on survey and details were not separately provided although Equipment Involved is recorded
(Republic of) Korea	Yes, office equipment was checked on survey. Survey did not request details and they were not separately provided although Equipment Involved is recorded
Russia	Not included in reporting

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Table 19 *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — PC (personal computer) equipment, domestic use only — Copier or printer — Vending equipment — PC (personal computer) — Other computer equipment — Telephone, answering machine, or fax machine A separate data element records fuel or power source for equipment.
USA	Yes, can be reported with any of 16 choices under Equipment Involved in Ignition, which are linked along with many other choices to a partially specified choice (other (unclassified or unknown type) electronic or other electrical equipment): — Computer — External computer storage device, including tape or disk drive — External computer modem — Computer monitor — Computer printer — Computer projection device, LCD panel, or projector — Other (unclassified or unknown type) computer device — Adding machine or calculator — Telephone or answering machine — Cash register — Copier — Fax machine — Paper shredder — Postage or shipping meter equipment — Typewriter — Other (unclassified or unknown type) office equipment Other data elements record fuel or power source and portability.

20 Other characteristics of fires related to cause of ignition (Questions 10a/fifth through tenth entries and 10c/eighth and ninth entries)

20.1 Summary comments on estimation of other characteristics of fires

The other characteristics of fires are grouped into seven categories:

— Electrical fires and electrical distribution or lighting equipment (not asked about in survey)

— All appliances and equipment not previously discussed

— Item first ignited defined by form or function

— Item first ignited defined by material composition

— Factors in ignition

— First major fuel package

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— Factors in fire growth

First major fuel package was only reported by Kenya, which provided no unsolicited details on how this is reported. This data element is not covered in the detailed tables by country, for that reason.

The survey also did not ask for details on coding categories for any of the other six categories, and only Canada, the United Kingdom, and the USA provided additional materials with such details. For other parts of this report, Australia's detailed coding has been taken from a 20-year-old report, where coding was based on an older edition of the USA's NFIRS; it is not known whether any of this coding is still in current use, and the old coding is not provided in detail for this item. Canada's detailed codes are taken from a decade-old coding manual; there is also some question whether Canada's more detailed reporting is in current use.

Of the other countries:

— China and Japan report on equipment involved in ignition, item first ignited, material used in item first ignited, and factors in ignition, but does not report on first major fuel package or factors in fire growth.

— Korea reports on equipment involved in ignition, item first ignited, material used in item first ignited, factors in ignition, and first major fuel package, but not on factors in fire growth, and provided few details on any categories while indicating that they have numerous detailed coding choices for several of the categories.

— Kenya reports on all seven categories of other characteristics but volunteered no coding details on any of them.

— France was undetermined for all seven categories, and Russia did not include any details on its reporting on these characteristics.

20.2 Recording of other characteristics of fires, by country

Tables 20A to 20F provide summaries of national responses on reporting of other characteristics of fires by Canada, the United Kingdom and the USA. Table 20A covers electrical failures and electrical distribution and lighting equipment. Table 20B covers all other types of appliances and equipment. Table 20C covers items first ignited by function of item. Table 20D covers type of material composing the item first ignited. Table 20E covers factors in ignition. Table 20F covers factors in fire growth.

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Table 20A — Reporting of electrical and electrical distribution or lighting equipment fires by country

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices (unclassified or unknown appliance, unclassified or unknown electrical equipment, or equipment not further specified) — Generator — Permanent electric wiring or cable, including junction box and power line, excluding copper or aluminum conductors — Copper conductor — Aluminum conductor — Transformer — Switchgear — Panelboard or switchboard, including fuse or circuit breaker — Switch, outlet, receptacle or socket — Temporary electric wiring excluding next three more specific types — Extension cord — Construction site or field wiring — Power bar — Low voltage wiring — Battery or rectifier — Unclassified or unknown electrical distribution equipment — Incandescent lamp or light bulb — Halogen lamp — Grow lamp or light — Fluorescent lamp including ballast — Unclassified or unknown electrical equipment (also linked to other electrical equipment, including office equipment)
Japan	Yes, electrical distribution or lighting equipment is response. Survey did not request details and they were not separately provided.

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Table 20A *(continued)*

Russia	Yes — Panel board or switchboard — Electrical branch circuit wiring or cable — Outlet or receptacle — Wall switch — Distribution-type transformer — Overcurrent disconnect equipment — Low-voltage transformer — Generator — Battery charger or rectifier — Battery — Table, floor or desk lamp — Incandescent light fixture — Light bulb — Detachable power cord or plug — Permanently attached appliance power cord or plug — Other (unclassified or unknown type) cord or plug
United Kingdom	Yes, can be reported under Main Source of Ignition: — Battery charger — Fairy lights — Spot lights — Other incandescent light bulbs — Fluorescent lights — Other lights — Power source apparatus – batteries, generators — Wiring, cabling, or plugs A separate data element records fuel or power source for equipment.

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Table 20A *(continued)*

USA	Yes, **electrical fires** can be reported with any of 8 choices in the Electrical Failure or Malfunction section of Factor Contributing to Ignition: — Water-caused short circuit arc — Short circuit arc from mechanical damage — Short circuit arc from defective or worn insulation — Unspecified short circuit arc — Arc from faulty contact or broken conductor — Arc or spark from operating equipment — Fluorescent light ballast — Other (unclassified or unknown type) electrical failure or malfunction The **nature of the electrical failure** can be inferred to some degree from entries under Heat Source. The following are the eight most frequently reported Heat Source entries for fires reported under Electrical Failure or Malfunction as electrical-failure fires, in U.S. homes: — Electrical arcing — Unclassified heat from powered equipment — Unclassified heat source — Radiated or conducted heat from operating equipment — Spark, ember or flame from operating equipment — Unclassified hot or smoldering object — Heat or spark from friction — Molten or hot material Yes, **electrical distribution or lighting equipment fires** can be reported with any of 40 choices under Equipment Involved in Ignition: — Electrical power (utility) line — Electrical service supply wires, from utility pole to meter box — Electrical meter or meter box — Electrical wiring from meter box to circuit breaker or fuse box or panel board — Panel board or switchboard — Electrical branch circuit wiring or cable

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Table 20A *(continued)*

USA	— Outlet or receptacle — Wall switch — Ground fault interrupter, portable or plug-in — Other (unclassified or unknown type) electrical wiring — Distribution-type transformer — Overcurrent disconnect equipment — Low-voltage transformer — Generator — Inverter — Uninterrupted power supply — Surge protector — Battery charger or rectifier — Battery — Table, floor or desk lamp — Lantern or flashlight — Incandescent light fixture — Fluorescent light fixture or ballast — Halogen light fixture or lamp — Sodium or mercury vapor light fixture or lamp — Portable work or trouble light — Light bulb — Other (unclassified or unknown type) lamp or lighting — Night light — Decorative light on line voltage — Decorative or landscape lighting on low voltage — Sign — Electric fence — Traffic control device — Lightning rod — Detachable power cord or plug — Permanently attached appliance power cord or plug — Extension cord — Other (unclassified or unknown type) cord or plug — Other (unclassified or unknown type) electrical distribution, lighting or power transfer equipment

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Table 20B — Reporting of other appliance and equipment fires by country

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices — Pressing iron — Lawn mower — Snow blower — Electric blanket or heating pad — Incinerator — Vacuum cleaner — Paint sprayer — Motor (separate reporting for over or under 1 horsepower) — Internal combustion engine — Heat treatment equipment — Industrial oven including kiln — Tar pot — Bearing, belting, conveyor or brake — Commercial or industrial machinery or equipment — Miscellaneous igniting object — Unknown igniting object
Japan	Yes, other appliance and equipment are reported. The survey for this project did not request details , which were not separately provided.
Russia	Yes — Power saw — Power lathe — Power shaper, router, joiner, planer — Power cutting tool — Power drill or screwdriver — Power sander, grinder, buffer, polisher — Air compressor — Gas compressor — Pump — Heat-treating equipment — Incinerator (also can be reported separately as a type of confined fire) — Industrial furnace, oven or kiln — Internal combustion engine — Elevator or lift — Lawn mower — Vacuum cleaner — Hair dryer — Clothes iron — Sewing machine

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Table 20B *(continued)*

United Kingdom	Yes, can be reported under Main Source of Ignition: — Vacuum cleaner — Iron — Trouser press — Extractor fan — Electric blanket — Hair dryer — Blow lamp/paint remover — Gardening equipment — Other domestic style appliance — Kiln, oven or furnace — Industrial dryer — Manufacturing equipment — Lift or dumb waiter — Other industrial equipment — Other categories for use with vehicles only — Other appliance or equipment A separate data element records fuel or power source for equipment.

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Table 20B *(continued)*

USA	Yes, can be reported with many choices under Equipment Involved in Ignition, including the following choices that have not been listed under prior entries in this report: — Power saw — Power lathe — Power shaper, router, joiner, planer — Power cutting tool — Power drill or screwdriver — Power sander, grinder, buffer, polisher — Power hammer — Power nail gun or stapler — Other (unclassified or unknown type) power tool — Paint dipper — Paint flow coating machine — Paint mixing machine — Paint sprayer — Coating machine — Other (unclassified or unknown type) painting tool — Air compressor — Gas compressor — Atomizing equipment — Pump — Wet/dry vacuum — Hoist, lift or crane — Powered jacking equipment — Drilling machinery or equipment — Other (unclassified or unknown type) hydraulic equipment — Heat-treating equipment — Incinerator (also can be reported separately as a type of confined fire) — Industrial furnace, oven or kiln — Tar pot or tar kettle

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Table 20B *(continued)*

USA	— Casting, molding or forging equipment — Distilling equipment — Digester or reactor — Extractor or waste recovery machine — Conveyor — Power transfer equipment — Power takeoff — Powered valves — Bearing or brake — Picking, carding, or weaving machine — Testing equipment — Gas regulator — Separate motor — Internal combustion engine — Printing press — Car washing equipment — Other (unclassified or unknown type) shop tool or industrial equipment — Dental, medical or other powered bed or chair — Other dental equipment — Dialysis equipment — Medical imaging equipment — Medical monitoring equipment — Oxygen administration equipment — Radiological equipment — Medical sterilizer — Therapeutic equipment — Other (unclassified or unknown type) medical equipment — Transmitter — Telephone switching gear — Television monitor array

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Table 20B *(continued)*

USA	— Studio-type television camera — Studio-type sound recording or modulating equipment — Radar equipment — Amusement ride equipment — Ski lift — Elevator or lift — Escalator — Microfilm or microfiche viewing equipment — Photo processing equipment — Vending machine — Non-video arcade game — Water fountain or water cooler — Telescope — Electron microscope — Other laboratory equipment — Other (unclassified or unknown type) commercial or medical equipment — Combine or threshing machine — Hay processing equipment — Farm elevator or conveyor — Silo loader, unloader, screw/sweep auger — Feed grinder, mixer, blender — Milking machine — Pasteurizer — Cream separator — Farm or garden sprayer — Chain saw — Weed burner — Lawn mower — Lawn or landscape trimmer or edger — Lawn vacuum

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Table 20B *(continued)*

USA	— Leaf blower — Mulcher, grinder or chipper — Snow blower or thrower — Log splitter — Post hole auger — Post driver or pile driver — Tiller or cultivator — Other (unclassified or unknown type) garden tool or agricultural equipment — Trash compactor (also can be reported separately as a type of confined fire) — Hot tub or whirlpool — Swimming pool equipment — Other (unclassified or unknown type) floor care equipment — Electric broom — Carpet cleaning equipment — Floor buffer, waxer or cleaner — Vacuum cleaner — Comb or hair brush — Curling iron — Electrolysis equipment — Hair curler warmer — Hair dryer — Lighted makeup mirror — Electric razor or shaver — Sunlamp or suntan equipment — Electric toothbrush — Other (unclassified or unknown type) portable appliance designed to produce heat — Baby bottle warmer — Electric blanket — Heating pad — Clothes steamer

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Table 20B *(continued)*

USA	— Clothes iron — Automatic door opener — Burglar alarm — Garage door opener — Gas detector — Intercom — Smoke or heat detector or fire alarm — Thermostat — Ashtray — Fire extinguishing equipment — Insect trap — Timer — Model vehicle — Powered toy — Woodburning kit — Clock — Gun — Jewelry-cleaning machine — Scissors — Sewing machine — Shoe polisher — Non-medical sterilizer — Other (unclassified or unknown type) personal or household equipment — Other (unclassified or unknown) equipment — No equipment — Undetermined Other data elements record fuel or power source and portability. Fires can be reported as any of six specific types of confined fires – for which much less detailed reporting is permitted – and two of the six refer to these other types of equipment (incinerator, commercial compactor).

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Table 20C — Reporting of item first ignited in terms of form and function by country

Canada	Yes, recorded as any of the following choices under Igniting Object; some of these choices are linked to partially specified choices — Wood roof covering — Non-wood roof covering — Exterior wall covering, surface or finish — Exterior trim or appurtenance including door, porch or balcony — Wood floor covering — Tile or plastic floor covering — Carpet or rug floor covering — Building component – floor, ceiling or roof — Building component – wall — Interior wall covering excluding plastic — Interior wall covering – plastic — Wood or high density fibreboard as ceiling covering — Low density fibreboard as ceiling covering — Plastic ceiling covering — Wood or wood product insulation — Plastic insulation — Mineral insulation — Unclassified building components — Undetermined building components — Upholstered furniture — Non-upholstered wood furniture — Non-upholstered plastic furniture — Ironing board — Mattress — Bedding — Drapery — Broom, mop or brush — Unclassified furniture or furnishing — Undetermined furniture or furnishing

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Table 20C *(continued)*

Canada	— Cotton clothing — Wool clothing — Synthetic fibre clothing — Cotton fabric — Wool fabric — Synthetic fibre fabric — Fur — Tarpaulin — Unclassified clothing or textile — Undetermined clothing or textile — Wood excluding wood products listed elsewhere and excluding felled timber — Wood shavings — Paper or packing material — Paper decoration — Wastepaper — Cardboard — Paper stock — Unclassified wood or paper product — Undetermined wood or paper product — Gasoline — Fuel oil not further specified — Diesel — Kerosene — Fondue fuel — Lighter fluid — Combustible liquid not further specified — Power steering fluid — Transmission fluid — Brake or hydraulic fluid — Motor grease

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Table 20C *(continued)*

Canada	— Crude oil — Motor oil — Contact cement — Glue — Flammable liquid not further specified excluding gasoline — Paint or varnish — Cooking oil or fat — Vegetable oil — Animal fat — Deep fat synthetic frying oil — Tar or asphalt — Polish or wax — Undetermined flammable or combustible liquid — Natural gas — Propane — Anaesthetic gas — Acetylene — Hydrogen — Unclassified flammable gas — Undetermined flammable gas — Cellulose nitrate — Plastic — Oxidizing material — Magnesium and alloys — Titanium, zirconium and alloys — Natural or synthetic rubber including tires and belts — Ammonium nitrate — Unclassified chemical, plastic or metal — Undetermined chemical, plastic or metal — Natural or synthetic fibre

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Table 20C *(continued)*

Canada	— Grain or flour — Food – starch — Food – protein — Food – fruit — Hay — Tree or shrub — Felled timber — Grass, brush or leaves — Manure — Natural Christmas tree — Unclassified agricultural or forestry product — Undetermined agricultural or forestry product — Coke or coal — Barbecue starter stick — Fire log — Barbecue starter briquette — Peat — Creosote — Sulphur or gunpowder — Wood treatment oil — Electrical insulation — Garbage, trash or rubbish — Oily rags — Artificial tree — Unclassified material first ignited — Undetermined material first ignited
Japan	Yes, item first ignited is reported in terms of form and function. The survey for this project did not request details , which were not separately provided.

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Table 20C *(continued)*

Russia	Yes — Exterior roof covering — Exterior sidewall covering — Exterior trim or appurtenance including door or porch — Floor covering — Upholstered furniture — Mattress or pillow — Clothing on a person — Curtain, blind, drapery or tapestry — Fabrics and yard goods — Agricultural crop — Electrical wire or cable insulation — Transformer or transformer fluid — Fence or pole — Pyrotechnics or explosives — Rubbish, trash or waste

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Table 20C *(continued)*

United Kingdom	Yes, can be reported under Item First Ignited: — Trees — Crops — Grassland/heath/scrub — Straw/stubble — Leaves — Hedge — Other vegetation — Cooking oil or fat — Other food — Animal products — Bedding — Clothing — Other textile — Bed or mattress — Upholstered furniture — Other furniture — Floor covering — Window covering — Lampshade — Other or unspecified furnishing — Roof — External fitting — Other structural, fixture or fitting – external — Internal fitting — Wiring insulation — Other structural, fixture or fitting – internal

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Table 20C *(continued)*

United Kingdom	— Raw foam — Raw rubber — Raw plastic — Fireworks (also listed under Major Source of Ignition) — Explosives or ammunition (also listed under Major Source of Ignition) — Gas — Petrol or oil product — Paint, varnish, resin, or creosote — Chemical in raw state — Decoration — Christmas tree — Rubbish or waste — Recycling of paper or cardboard — Recycling other— Paper or cardboard — Other paper or cardboard — Garden shed — Other wooden objects including fence — Other item

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Table 20C *(continued)*

USA	Yes, can be reported with many choices under Item First Ignited: — Exterior roof covering — Exterior sidewall covering — Exterior trim or appurtenance including door or porch — Floor covering — Interior wall covering — Interior ceiling covering — Structural member or framing — Thermal or acoustical insulation — Other (unclassified or unknown type) structural component or finish — Upholstered furniture — Non-upholstered chair or bench — Cabinetry — Ironing board — Appliance housing or casing — Household utensil — Other (unclassified or unknown type) furniture or utensil — Mattress or pillow — Bedding — Linen other than bedding — Clothing not on a person — Clothing on a person — Curtain, blind, drapery or tapestry — Fabrics and yard goods — Luggage — Other (unclassified or unknown type) soft goods or clothing — Christmas tree — Decoration — Sign — Chips

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Table 20C *(continued)*

USA	— Toy or game — Awning or canopy — Tarpaulin or tent — Other (unclassified or unknown type) adornment or recreational material — Box or bag — Raw materials being used to make a product — Empty pallet or skid — Cord, rope, twine or yarn — Packing or wrapping material — Baled goods or material — Bulk storage — Palletized material — Rolled or wound material — Other (unclassified or unknown type) storage supplies — Atomized or vaporized liquid — Flammable liquid or gas in or escaping from combustion engines — Flammable liquid or gas in or escaping from final container or pipe before engine or burner — Flammable liquid or gas in or escaping from container or pipe — Uncontained flammable liquid or gas — Pipe, duct, conduit or hose — Pipe, duct, conduit or hose covering — Filter — Other (unclassified or unknown type) liquid, piping or filter — Agricultural crop — Light vegetation excluding crop — Heavy vegetation excluding crop — Animal, living or dead — Human, living or dead — Cooking materials

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Table 20C *(continued)*

USA	— Feathers or fur not on a bird or animal but not processed into a product — Other (unclassified or unknown type) organic material — Electrical wire or cable insulation — Transformer or transformer fluid — Conveyor, drive or V-belt — Tire — Railroad tie — Fence or pole — Fertilizer — Pyrotechnics or explosives — Book — Magazine, newspaper, writing paper — Adhesive — Dust, fiber or lint — Film or residue — Rubbish, trash or waste — Oily rags — Multiple items first ignited — Other (unclassified or unknown type) item first ignited — Undetermined

Table 20D — Reporting of item first ignited in terms of material composition by country

Canada	Yes, all coding is integrated into coding for item first ignited in terms of form and function, in Table 20C.
Russia	Yes — Natural gas — Flammable liquid — Plastic — Rubber — Hay or straw — Grain or natural fiber — Wood chips, sawdust or wood shavings — Paper
United Kingdom	Yes, all coding is integrated into coding for item first ignited in terms of form and function, in Table 20C.

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Table 20D *(continued)*

USA	Yes, can be reported with any of many choices under Type of Material First Ignited (reporting not required for organic or general materials – everything in Table 20C from "agricultural crop" to the end of the cell entry): — Natural gas — Liquefied petroleum (LP) gas — Anaesthetic gas — Acetylene gas — Hydrogen — Other (unclassified or unknown type) flammable gas — Class 1A flammable liquid — Class 1B flammable liquid excluding gasoline — Class II combustible liquid — Gasoline — Class 1C flammable liquid — Class IIIA combustible liquid — Class IIIB combustible liquid — Other (unclassified or unknown type) flammable or combustible liquid — Fat or grease — Non-food grease — Polish, paraffin or wax — Adhesive, resin, tar or glue — Applied paint or varnish — Combustible metal — Solid chemical — Radioactive material — Other (unclassified or unknown type) volatile solid or chemical — Wood chips, sawdust or wood shavings — Round timber — Sawn wood

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Table 20D *(continued)*

USA	— Plastic — Rubber excluding synthetic rubber — Cork — Leather — Hay or straw — Grain or natural fiber — Coal or coke — Food or starch — Tobacco — Other (unclassified or unknown type) natural product — Plywood — Fiberboard or particleboard — Wood pulp — Paper — Cardboard — Other (unclassified or unknown type) wood or paper — Fabric or fiber excluding fur and silk — Fur or silk — Wig — Human hair — Plastic-coated fabric — Other (unclassified or unknown type) fabric, textile or fur — Linoleum — Oil cloth — Asphalt-treated material — Other (unclassified or unknown type) material compounded with oil — Multiple types of material — Other (unclassified or unknown type) type of material — Undetermined

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Table 20E — Reporting of factors in ignition by country

Canada	Yes. Specific codes below omit codes previously listed for intentional fires and child-playing fires. — Misuse of smoker's material — Thawing — Inadequate control of open fire — Welding or cutting too close — Torch too close — Unclassified misuse of source of ignition (also links to playing with fire choices) — Undetermined misuse of source of ignition (also links to playing with fire choices) — Fuel spilled accidentally — Improper fuelling technique — Flammable liquid used to kindle fire — Cleaning or washing part — Improper container — Overheated cooking oil, grease or wax — Combustible placed too close to heat — Improper storage — Unclassified misuse of material ignited — Undetermined misuse of material ignited — Part failure, leak or break — Automatic control failure — Manual control failure — Electrical short circuit (can also be used to identify electrical fires; see Table 20A) — Part worn out — Backfire of engine — Unclassified mechanical or electrical failure or malfunction — Undetermined mechanical or electrical failure or malfunction — Design deficiency — Construction deficiency — Installed too close to combustible — Other installation deficiency

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Table 20E *(continued)*

Canada	— Over-fusing (can also be used to identify electrical fires; see Table 20A) — Suspected faulty connection involving aluminum wiring (can also be used to identify electrical fires; see Table 20A) — Suspected faulty connection involving copper wiring (can also be used to identify electrical fires; see Table 20A) — Unclassified construction, design or installation deficiency — Undetermined construction, design or installation deficiency — Over-fuelling — Wood-burning appliance — Log rolled out — Screen not closed — Glass doors exploded or shattered — Paper fell out — Flying embers — Unclassified misuse of equipment — Undetermined misuse of equipment — Asleep — Temporary loss of judgment suspected — Physical or mental disability — Accident — Suspected impairment by alcohol, medication or other drugs — Asleep due to suspected use of alcohol, medication or other drugs — Fatigued — Ignorance of hazard — Distracted or preoccupied — Unclassified human failing — Undetermined human failing — Eight categories of vehicle accident — Tampering with safety devices — Unclassified miscellaneous act or omission — Hot exhaust or catalytic converter — Act or omission not applicable — Undetermined act or omission
Japan	Yes, factors in ignition are reported under Causing Process (see Annex C).

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Table 20E *(continued)*

United Kingdom	Yes. These are the factors under the Accidental section of "What was the cause?" excluding those already cited for intentional and fireplay fires: — Faulty fuel supplies (separately for gas, electricity, and petrol product) — Faulty leads to equipment or appliance — Fault in equipment or appliance — Cooking (separating deep fat fryers from other equipment but not isolating unattended cooking or other specific behavioral errors) — Negligent use of equipment or appliance — Careless handling due to sleep or unconsciousness — Careless handling due to careless disposal — Careless handling due to knocking over — Combustible articles too close to heat source or fire (and vice versa) — Person too close to heat source or fire — Vehicle crash or collision — Chimney fire — Bonfire going out of control — Other intentional burning going out of control — Accumulation of flammable material — Natural occurrence — Overheating due to unknown cause Also a separate data element captures human factors contributing to ignition — Disabled — Distraction — Temporary lack of physical mobility — Other medical condition or illness — Falling asleep or asleep — Excessive and dangerous storage — Other — And there is a Yes/No data element on suspected drugs/alcohol as a contributory factor

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Table 20E *(continued)*

USA	Yes, these are the choices under Factor Contributing to Ignition, excluding those cited earlier: — Abandoned or discarded material or product — Heat source too close to combustibles — Cutting or welding too close to combustibles — Flammable liquid or gas spilled — Improper fuelling technique — Flammable liquid used to kindle fire — Washing or painting part or material with flammable liquid — Improper container — Other (unclassified or unknown type) misuse of product or material (also linked to "playing with fire") — Automatic control failure — Manual control failure — Leak or break — Worn out — Backfire — Improper fuel used — Other (unclassified or unknown type) mechanical failure or malfunction — Design deficiency — Construction deficiency — Installation deficiency — Manufacturing deficiency — Other (unclassified or unknown type) design, manufacturing or installation deficiency — Collision, knock down, run over, turn over. — Accidentally turned on or not turned off — Equipment unattended — Equipment overloaded — Failure to clean — Improper start-up or shutdown procedure — Equipment not used for intended purpose — Equipment not operated properly — Other (unclassified or unknown type) operational deficiency — Rekindle — Outside or open fire for debris or waste disposal — Outside or open fire for warming or cooking — Agriculture or land management burn — Other (unclassified or unknown type) fire spread or control (also linked to exposure fire) — Other (unclassified or unknown type) factor contributing to ignition

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Table 20F — Reporting of factors in fire growth by country

Canada	Yes, through several data elements defined primarily as descriptions of the path of flame spread or smoke spread — Flame spread via interior finish — Flame spread via vertical openings, including factors of unenclosed stairwell or elevator shaft, inadequate firestopping, or failure of rated assembly — Flame spread via horizontal openings, including burn-through or doors left open in rated assembly — Smoke spread, including through openings in construction
United Kingdom	Yes. Item Mainly Responsible for Spread of Fire uses same choices as Item First Ignited (see Table 20D). Also some data elements on explosions, dangerous substances involved.
USA	Yes, a data element on Primary Item Contributing to Fire Spread is available with the same choices shown in Table 20D for Item First Ignited. Also can be reported with any of the many choices under Fire Suppression Factors, shown below. — Roof collapse — Roof assembly combustible — Ceiling collapse — Holes or openings in walls or ceilings — Wall collapse — Difficult to ventilate — Combustible interior finish — Balloon construction — Internal arrangement of partitions — Internal arrangement of stock or contents — Floor collapse — Lack of fire barrier walls or doors — Transoms — Attic undivided — Insulation combustible — Stairwell not enclosed — Elevator shaft — Dumbwaiter — Vertical duct — Rubbish or laundry chute — Supports unprotected — Composite plywood I-beam construction — Composite roof/floor sheathing construction — Wood truss construction — Metal truss construction — Bars on windows or other fixed burglar protection assemblies — Quick release failure of bars on windows or doors

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Table 20F *(continued)*

USA	— Previously damaged by fire — Other (unclassified or unknown type) building construction or design — Door left open or outside door unsecured — Fire door blocked or did not close properly — Violation of applicable or locally adopted fire, building or life safety code — Illegal or clandestine drug operation — Intoxication by alcohol or other drugs — Riot or civil disturbance — Person interfered with operation — Accelerant used — Other (unclassified or unknown type) act or omission — Aisle blocked or improper width — Significant and unusual fuel load from structure components — Significant and unusual fuel load from contents of structure — Significant and unusual fuel load outside from natural environment conditions — Significant and unusual fuel load from man-made condition — Improper storage — Radiological hazard on-site — Biological hazard on-site — Cryogenic hazard on-site — Hazardous chemical, corrosive material or oxidizer — Flammable or combustible liquid hazard — Explosives hazard present — Decorations — Natural or other lighter-than-air gas present — Liquefied petroleum (LP) or other heavier-than-air gas present — Combustible storage extending more than 12 feet above ground — High rack storage — Other (unclassified or unknown type) on-site materials — Delayed detection of fire

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Table 20F *(continued)*

USA	— Delayed reporting of fire — Alarm system malfunction — Alarm system shut off for valid reason — Alarm system inappropriately shut off — Unable to contact fire department — Information incomplete or incorrect — Communications problem — Blocked or obstructed roadway — Poor or no access for fire department apparatus — Traffic delay — Trouble finding location — Size, height or other building characteristic delayed access to fire — Power lines down or arcing — Poor access for firefighters — Secured area — Guard dog — Aggressive animal excluding guard dog — Suppression delayed due to evaluation of hazardous or unknown materials at incident scene — Locked or jammed door — Apparatus failure before arrival at incident — Hydrant inoperative — Air space restriction — Military activity — Closest apparatus unavailable — Other (unclassified or unknown cause) delay — Automatic fire suppression system problem — Automatic sprinkler or standpipe connection problem — Water supply (private) inadequate — Water supply (public) inadequate — Electrical power outage

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Table 20F *(continued)*

USA	— Failure of rated fire protection assembly — Protective equipment negated illegally or irresponsibly — Other (unclassified or unknown type) protective equipment — Occupancy load above legal limit — Evacuation activity impeded fire department access — Window type impeded egress — Windowless wall — Young occupant — Elderly occupant — Physically disabled occupant — Mentally disabled occupant — Physically restrained or confined occupant — Medically disabled occupant — Special event — Public gathering — Other (unclassified or unknown type) egress or exit problem — Drought or low fuel moisture — Low humidity — High humidity — Low temperature — High temperature — Fog — Flooding — Ice — Rain — Snow — Wind — Earthquake — Unusual vegetation fuel loading — Threatened or endangered species — Timber sale activity — Fire restriction — Historic disturbance (current fire behavior affected by past fire history) — Urban-wildland interface area — Other (unclassified or unknown type) natural condition — Other (unclassified or unknown type) fire suppression factor — No fire suppression factor

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21 Sprinklers and other extinguishing equipment (Question 11a/first entry)

21.1 Summary comments on sprinklers and other extinguishing equipment

Most countries collect information on presence of automatic extinguishing equipment and separately on type and performance of the equipment.

21.2 Recording of sprinklers and other extinguishing equipment, by country

Table 21A provides a summary of national responses on reporting on the presence and type of such equipment. Table 21B provides a summary of national responses on reporting on the performance of such equipment.

Table 21A — Presence and type of sprinkler or other extinguishing equipment by country

Australia	Yes, included in reporting. No coding for different types of sprinklers or for different types of automatic extinguishing equipment. Coding refers to “sprinklers”, which suggests that non-water based systems are not captured here.
Canada	Yes, included in reporting. Coding refers to presence in building and not relevance to fire. Separate coding for sprinklers versus other types of automatic extinguishing equipment. **Sprinkler Codes – complete versus partial** — Complete Sprinkler Protection - supervised or watchman service — Complete Sprinkler Protection - alarm to fire department — Complete Sprinkler Protection - unsupervised, local alarms only — Partial Sprinkler Protection - supervised or watchman service — Partial Sprinkler Protection - alarm to fire department — Partial Sprinkler Protection - unsupervised, local alarms only — No Sprinkler Protection — Not Applicable - vehicle, outside area, etc. — Sprinkler Protection - unclassified — Cannot Be Determined **Sprinkler Codes – type of sprinkler** — Wet Pipe System - includes central station supervised, standard watchman service, or alarm connection to fire department — Wet Pipe System - local alarm only — Dry Pipe System - includes central station supervised, standard watchman service, or alarm connection to fire department — Dry Pipe System - local alarm only — Pre-Action System - includes central station supervised, standard watchman service, or alarm connection to fire department — Pre-Action System - local alarm only — Deluge System - includes central station supervised, standard watchman service, or alarm connection to fire department — Deluge System - local alarm only — Sprinkler System - unclassified

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Table 21A *(continued)*

Canada	**Fixed System Other Than Sprinkler – Presence and Relationship to Alarm Provisions:** — Fixed System Other Than Sprinkler - supervised or watchman service — Fixed System Other Than Sprinkler - alarm to fire departments — Fixed System Other Than Sprinkler - unsupervised, local alarms only — No Fixed System — Not Applicable - vehicle, outside area, etc. — Fixed System Other Than Sprinkler – unclassified **Fixed System Other Than Sprinkler – Type of Extinguishing Agent** — Carbon Dioxide System — Dry Chemical System — Halon System — Conventional (Protein) Foam System — High Expansion Foam System — Foam-Water System — Water Spray System — Wet Chemical System — Fixed System Other Than Sprinklers - unclassified
China	No, not included in reporting.
France	Undetermined
Japan	Yes, there is reporting on sprinkler systems, water spray, foam, inert gas, and halogenated extinguishing systems. Coding addresses presence or absence of any equipment on the list and also addresses the success of failure of function of each equipment.
Kenya	No, not included in reporting.
(Republic of) Korea	Yes, there is reporting on automatic extinguishing equipment. It is not clear what is reported, and there does not appear to be any coding by type of equipment.
Russia	No, not included in reporting.

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Table 21A *(continued)*

United Kingdom	Yes, included in reporting under "Active Firefighting Systems present in vicinity of fire (origin of fire)." Question 7.11 is whether any active safety system was present, yes or no. **Type of system; multiple types of systems can be checked:** — Sprinklers — Water mist — Gaseous system – halon — Gaseous system – other — Drencher — Foam — Powder — "Other" [which could be automatic extinguishing equipment or other active firefighting system] **Location of system relative to fire:** — In room of origin — On same floor — Different floor
USA	**Presence; only one system can be reported.** — Present — Partial — None present — Undetermined **Type of system; choose the system present in the area of fire origin, and if there are multiple systems in the area, choose the system designed to protect the hazard where the fire started:** — Wet-pipe sprinkler system — Dry-pipe sprinkler system — Other sprinkler system (including deluge or pre-action sprinkler system) — Dry chemical system — Foam system — Halogen-type system (including nonhalogenated systems that operate on same principle) — Carbon dioxide system — Other special hazard system — Undetermined

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Table 21B — Performance of sprinkler or other extinguishing equipment by country

Australia	**Sprinkler performance** — Extinguished fire — Prevented spread, but did not extinguish — Did not prevent spread — Equipment operated, performance not classified above — Equipment should have operated but did not — Equipment present but fire too small to require operation — No equipment present in room or space of fire origin — Performance of equipment not classified above — Sprinkler performance; insufficient information available to classify further — Performance of equipment undetermined — Sprinkler performance not reported **Factors degrading effectiveness** — High severity of fire — System disconnected — Inadequate water supply (at the time of fire) — Obstruction of system — Faulty component in system — Premature closure of valve — Fire started in un-sprinkled area — Not applicable — Factor degrading sprinkler effectiveness not classified above — Factor degrading sprinkler effectiveness undetermined — Factor degrading sprinkler effectiveness not reported **Number of sprinkler heads that operated.**
Canada	**Performance of Automatic Extinguishing Equipment:** — Equipment Operated — Equipment Should Have Operated But Did Not — Equipment Present but Fire too Small to Require Operation — No Equipment Present in Room or Area of Origin of Fire — Performance of Automatic Extinguishing Equipment - unclassified — Performance of Automatic Extinguishing Equipment – unknown
China	Not included in reporting
France	Undetermined
Japan	Yes, there is reporting on sprinkler systems, water spray, foam, inert gas, and halogenated extinguishing systems. Coding addresses presence or absence of any equipment on the list and also addresses the success or failure of function of each equipment.
Kenya	Not included in reporting
(Republic of) Korea	There are coding elements: “Did it work?” and “If it didn’t work, why?”. Do not know what coded or narrative answers are available for these elements.
Russia	Not included in reporting

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Table 21B *(continued)*

United Kingdom	**Whether the system operated, answered for each system:** — No — Yes but did not raise alarm — Yes and raised alarm **Number of sprinkler heads operating (asked only for sprinklers).** Answers are 0,1,2,3,4,5, more than 5, and unknown. **System's impact upon fire:** — Extinguished — Contained or controlled — Did not contain or control — Unknown **Main reason why system did not function as intended** — System not set up correctly or not installed correctly — System damaged by fire — Fault in system (such as defective system, lack of maintenance, heads painted over) — System turned off — Fire in area not covered by system — Other — Unknown
USA	**Operation of system** — Operated and was effective — Operated and was not effective — Fire too small to activate system — System did not operate — Other operation — Undetermined **Number of sprinkler heads operating.** **Reason for system failure [or ineffectiveness]** — System shut off — Not enough agent discharged to control the fire — Agent discharged, but did not reach the fire — Inappropriate system for the type of fire — Fire not in area protected by the system — System components damaged — Lack of maintenance, including corrosion or heads painted — Manual intervention defeated the system — Other reason system not effective — Undetermined

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22 Detection and alarm equipment (Question 11a/second entry)

22.1 Summary comments on detection and alarm equipment

Most countries collect information on presence of detection and alarm equipment and separately on type and performance of the equipment.

22.2 Recording of detection and alarm equipment, by country

Table 22A provides a summary of national responses on reporting on the presence and type of such equipment. Table 22B provides a summary of national responses on reporting on the performance of such equipment.

Table 22A — Presence and type of detection or alarm equipment by country

Australia	Yes, included in reporting. No mention of fire detectors that are not smoke detectors (for example, heat detectors). **Smoke Alarms/Detector Presence** — Smoke alarm present — Unable to determine presence of smoke alarm — No smoke alarm present **Smoke Alarms/Detector Power Source** — Battery only — Hard wire only — Plug in — Hard wire with battery — Plug in with batter — Mechanical — Multiple alarms and power supplies — Alarm power supply not applicable — Other power supply not classified above

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Table 22A *(continued)*

Canada	Yes, included in reporting. Coding refers to presence in building and not relevance to fire. **Presence of Detection/Alarm System:** — No central alarm — Single stage central alarm — Single stage central alarm, connection to remote monitoring agency (See Section H2) — Two stage central alarm — Two stage central alarm, connection to remote monitoring agency — Central alarm with voice — Central alarm with voice, connection to remote monitoring agency — Not applicable (vehicle, outside area, etc.) — Cannot be determined **Type of Detection Device(s) Present:** — No detection devices — Smoke detectors — Smoke detectors, heat detectors and smoke detectors in return air ducts — Heat detectors and smoke detectors in return air ducts — Heat detectors — Smoke detectors and specialty detectors — Heat detectors and specialty detectors — Not applicable (vehicle, outside area, etc.) — Heat detectors, smoke detectors and specialty detectors — Cannot be determined Note: Specialty detectors include flame detectors, beam detectors and line detectors.
China	No, not included in reporting.
France	Undetermined
Japan	Yes, there is reporting on automatic fire alarm system, electric leakage alarm system, and emergency alarm system. Coding addresses presence or absence of any equipment on the list and also addresses the success or failure of function of each equipment.
Kenya	No, not included in reporting.
(Republic of) Korea	Yes, presence or absence included in reporting. Following types are included; not clear whether presence or absence is reported separately by type or only for presence of any equipment on list: — Automatic detection — Fire alarm — Emergency voice alarm — Electric leakage alarm — Detectors — Gas leakage alarm — Independent detectors
Russia	No, not included in reporting.

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Table 22A *(continued)*

United Kingdom	Yes, included in reporting. **How the fire was discovered.** — Automatic fire alarm — Person — Other, including discovery by animal **Was any active safety system present?** — Yes — No **Type of system.** — Smoke alarm – 1 year battery — Smoke alarm – long life battery — Smoke alarm – mains — Smoke alarm – mains and battery — Smoke alarm – battery type not known — Mains security system including smoke alarm — Other, including system with central panel **Location relative to fire:** — In room of origin — On same floor — Different floor

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Table 22A *(continued)*

USA	Yes, included in reporting. **Presence within designed range of fire; only one system can be reported.** — Present — None present — Undetermined **Type of detector; choose the system present in the area of fire origin:** — Smoke detector — Heat detector — Combination smoke and heat detector in a single unit — Sprinkler, water flow detection — More than one type present — Other detector type — Undetermined **Detector power supply:** — Battery only — Hardwire only — Plug-in — Hardwire with battery backup — Plug-in with battery backup — Mechanical, including spring-wound, stored pressure source — Multiple detectors and power supplies — Other detector power supply — Undetermined

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Table 22B — Performance of detection or alarm equipment by country

Australia	**Operation** — Failed to operate — Operated properly — Operation of smoke alarm not applicable **Effectiveness** — Alerted occupants — Occupants failed to respond — There were no occupants — Failed to alert occupants — Effectiveness of smoke alarm not applicable — Other not classified above **Reasons for Failure** — Hard wire power failure, shutoff or disconnect — Improper installation or placement — Defective — Lack of cleaning — Battery missing or disconnected — Battery discharge or dead — Fire not within designed range of smoke alarm — Reason for smoke alarm failure not applicable — Other reason for alarm failure not classified above

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Table 22B *(continued)*

Canada	**How Fire Was Detected:** — Smoke Alarm Device — Smoke Detector Device — Heat Alarm Device — Heat Detector Device — Automatic Sprinkler System — Automatic System Other Than Sprinkler — Visual Sighting or Other Means of Personal Detection — No initial detection (burned out before detection) — Initial Detection - unclassified — Initial Detection – unknown **Performance and Reasons for Failure** — No Smoke Alarm — Alarm in Room of Origin - Activated — Alarm Not in Room of Origin - Activated — Alarm in Room of Origin – Not Activated – Non-suitable Location — Alarm in Room of Origin – Not Activated – Battery Dead — Alarm in Room of Origin – Not Activated – No Battery — Alarm in Room of Origin – Not Activated – AC Not Connected/Disabled — Alarm in Room of Origin – Not Activated – Mechanical Failure — Alarm Not in Room of Origin – Not Activated – Battery Dead — Alarm Not in Room of Origin – Not Activated – No Battery — Alarm Not in Room of Origin – Not Activated – AC Not Connected/Disabled — Alarm Not in Room of Origin – Not Activated – Mechanical Failure — Not Enough Smoke to Activate Smoke Alarm — Smoke Alarm Activation - Unknown **Impact** — Not Applicable/No Occupants — Occupants Evacuated Safely — Occupants Did Not Evacuate – Alarm Inaudible — Occupants Did Not Evacuate – Physically/Mentally Challenged — Occupants Did Not Evacuate – Age Related (Infants/Aged) — Occupants Did Not Evacuate – Unnecessary to Evacuate — Occupants Did Not Evacuate – Suspected Influence of Drugs/Alcohol — Occupant Response/Evacuation – Unknown
China	Not included in reporting
France	Undetermined
Japan	Coding addresses not only presence or absence of each equipment on the list but also success or failure of function of equipment.
Kenya	Not included in reporting
(Republic of) Korea	Not included in reporting

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Table 22B *(continued)*

Russia	Not included in reporting
United Kingdom	**Did the system operate? Answered for each system:** — No — Yes but did not raise alarm — Yes and raised alarm **Main reason why system did not function as intended** *Reasons allowed when answer to above is No* — Alarm battery missing — Alarm battery defective — System not set up correctly — System damaged by fire — Fire not close enough to detector — Fault in system — System turned off — Fire in area not covered by system — Detector removed — Alerted by other means *Reasons allowed when answer to above is Yes but did not raise alarm* — Alarm was raised before the system operated — No person in earshot — Occupants did not respond — No other person responded *Reasons allowed in all cases* — Other — Unknown **Was anyone in the building at the time of the fire?** — Yes — No

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Table 22B *(continued)*

United Kingdom	**Is the building normally occupied:** — Yes – occupied — No – unoccupied permanently (vacant) [excludes derelict properties] — No – under construction [and not habitable] — Not known
USA	**Operation** — Fire too small to activate detector — Detector operated — Detector failed to operate — Undetermined **Effectiveness.** — Detector alerted occupants, occupants responded — Detector alerted occupants, occupants failed to respond — There were no occupants — Detector failed to alert occupants — Undetermined *For confined fires, where reduced reporting is permitted, there is a mandatory question that covers some of this information* — Detector alerted occupants — Detector failed to alert occupants — Unknown **Reason for system failure [or ineffectiveness]** — Power failure or hardwired detector shut off or disconnected — Improper installation or placement of detector — Defective detector — Lack of maintenance, including not cleaning — Battery missing or disconnected — Battery discharged or dead — Other detector failure reason — Undetermined

23 Fire extinguishers and other manual extinguishing equipment (Question 11a/third entry)

23.1 Summary comments on fire extinguishers and other manual extinguishing equipment

Most countries do not collect information on presence of fire extinguishers and other manual extinguishing equipment. Australia, Canada and the United Kingdom are the countries that report and with some detail.

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23.2 Recording of fire extinguishers and other manual extinguishing equipment, by country

Table 23 provides a summary of national responses on reporting on the presence of such equipment.

Table 23 — Presence of extinguishers or other manual extinguishing equipment by country

Australia	Yes, included in reporting. **Extinguishers Installed** — Yes — No — Undetermined Separate data element reports number of extinguishers used by occupants (non-fire personnel). **Hose Reels Installed** — Yes — No — Undetermined Separate data element reports number of hose reels used by occupants (non-fire personnel). **Hydrants Installed** — Yes — No — Undetermined Separate data element reports number of hydrants used by occupants (non-fire personnel).
Canada	Yes, included in reporting under “Manual Fire Protection Facilities”. — Extinguishers & Standpipe System — Extinguishers — Standpipe System — No Manual Fire Protection — Not Applicable - outside area, etc. — Manual Fire Protection Facilities - unclassified — Cannot Be Determined Under “Outside Fire Protection”, there is an opportunity to report the presence of municipal or private hydrants, but the emphasis is on hydrants for use by fire brigades not by occupants.
China	No, not included in reporting.
France	Undetermined
Japan	Yes, there is reporting on portable fire extinguishers, indoor fire hydrant systems, and outdoor fire hydrant systems. Coding addresses presence or absence of each type of equipment on the list and also addresses success or failure of function of each type of equipment.
Kenya	No, not included in reporting.
(Republic of) Korea	Yes, there is reporting on installation or use of fire extinguishers and indoor hydrants.

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Table 23 *(continued)*

Russia	Yes, included in reporting **Fire extinguishers:** — air-foam — foam or water — carbon dioxide — chladone — powder — combined (foam, powder) — aerosol — other
United Kingdom	Yes, included in reporting under main action taken by "the general public" prior to arrival [of fire brigade] – clarified to mean the **main method of firefighting**. Fire extinguishers and use of hose reels are two of the coding options; these are the others: — Removal from heat source — Fuel supply disconnected — Smothering — Water from bucket/container — Water from garden hose — Beaten out — Work team [clarified to mean a trained private team and not just a fire warden] — Other Not known **Possibly relevant are the choices on fixed firefighting facilities present:** — Dry risers — Wet risers — Firefighting lift — Firefighting shaft — Foam makers/drenchers/downcomers — Smoke extraction/ventilation — Other For each type checked above, a separate data element asks whether it was used, Yes or No. Another data element asks for reasons if it was not working: — Poor maintenance — Vandalism — Damaged by fire
USA	No, not included in reporting.

24 Smoke management and control equipment (Question 11a/fourth entry)

24.1 Summary comments on smoke management and control equipment

Most countries do not collect information on presence of smoke management and control equipment. Australia, Canada and the United Kingdom are the countries that report and with some detail.

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24.2 Recording of smoke management and control equipment, by country

Table 24 provides a summary of national responses on reporting on the presence of such equipment.

Table 24 — Presence of smoke management or control equipment by country

Australia	Probably not, although there is information on “Air Handling System”.
Canada	No, not included in reporting.
China	No, not included in reporting.
France	Undetermined
Japan	Yes, there is reporting on smoke control systems. Coding addresses presence or absence of smoke control systems and also addresses success or failure of function of smoke control systems.
Kenya	No, not included in reporting.
(Republic of) Korea	Yes, there is reporting on installation or use of smoke control system. No information on details.
Russia	No, not included in reporting.
United Kingdom	Yes, “smoke extraction or ventilation” is one of seven choices included in reporting under fixed firefighting facilities. One data element can be used to indicate presence of the equipment, a second data element can be used to report whether it was used, and a third data element can be used to record reasons if it was not working: — Poor maintenance — Vandalism — Damaged by fire
USA	No, not included in reporting.

25 Fire doors, fire walls and other elements of compartmentation (Question 11b/second entry)

25.1 Summary comments on fire doors, fire walls and other elements of compartmentation

Most countries collect information on type of construction.

25.2 Recording of fire doors, fire walls, and other elements of compartmentation, by country

Table 25 provides a summary of national responses on reporting on fire doors, fire walls and other elements of compartmentation.

Table 25 — Reporting on fire doors, fire walls and other compartmentation by country

Australia	Need clarification. Survey says this is included in reporting and refers reader to attachment, but attachment has no details on compartmentation.

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Table 25 *(continued)*

Canada	Yes, included in reporting indirectly as factors in flame spread: **Flame Spread – Vertical Openings** — Through Unenclosed Stairwell or Elevator Shaft — Through Inadequate Firestopping, including inside of walls, around pipes, poke-throughs — Through Air-Handling Ducts — Through Utility Shaft — Through Failure of a Rated Assembly — By Way of the Exterior of the Building — Not a Factor — Flame Spread Vertical Openings- unclassified **Flame Spread – Horizontal Openings** — Through Air-Handling Ducts — Through Attic Spaces, Ceilings or Concealed Spaces — Doors Burned Through in Rated Assembly — Though Doors Open in Rated Assembly — Through Corridor — Through Utility Openings — Through Windows — Not a Factor — Flame Spread Horizontal Openings - unclassified **Smoke Spread Avenues** — Through Air-Handling Ducts — Through the Corridor — Through the Elevator Shaft — Through the Stairwell — Through Openings in Construction, including gaps between slabs and walls, over doors — Through Utility Openings - horizontal walls — Through Utility Openings - in floors — Not a Factor — Smoke Spread Avenues - unclassified
China	**No,** not included in reporting.
France	**Undetermined**
Japan	**No,** not included in reporting.
Kenya	**No,** not included in reporting.
(Republic of) Korea	**Yes,** there is reporting on installation or use of: — Fire shutters — Fire doors — Compartmentation
Russia	**Yes,** there is reporting on installation or use of: — Fire shutters — Fire doors

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Table 25 *(continued)*

United Kingdom	Yes, included in reporting. **Compartmentation performance** — Stopped/checked spread — Breached – current building work (refers to construction work currently underway) — Breached – previous building work (refers to construction work completed) — Breached – fire doors left open or incorrectly fitted (includes smoke doors) — Damage to compartmentation — Fire spread through gaps or voids in construction (for example, ducts) — No compartmentation in building [examples cited are warehouses and supermarkets, where there are large undivided spaces] — Other Elements related to compartmentation under **Means of Escape**: — Okay – no visible concerns — Exits locked — Exits blocked (for example, materials stored blocking exit) — Exit route blocked by smoke/flames — Poor implementation such as doors swing the wrong way or complicated exit path — Contents contributing to abnormal fire spread/smoke production — Other
USA	No, not included in reporting since 1999. During 1980-1983, the USA used codes similar to those still used in Canada. Some of those codes were used until 1998.

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Annex A
(informative)

Survey Instrument: ISO/TC 92/WG 8 survey — National definitions and practices — Data collection regarding incidents of fire

A.1 Background

ISO Technical Committee 92 is the committee of ISO concerned with standards related to fire, including test standards and engineering practices. Working Group 8 is seeking to develop a report on national practices in the development of national fire statistics. This survey is part of that task.

Several standards developed by Technical Committee 92 require fire statistics for implementation. For example, engineering analysis may require estimates of the relative likelihood of different types of fires.

To make those standards useful to the maximum number of nations, TC92 requires more information on national practices in developing national fire statistics. Only then will it be possible to determine which countries can develop statistics specific to their national fire experience in a form suitable for use in a particular standard.

A.2 Should you complete this survey form?

Are you responsible for or at least familiar with the practices used in collecting and analyzing data used to produce fire statistics for your country? _____ Yes _____ No

If "Yes", please indicate the country(s) covered by the database. _____

If "No", please skip to the end of the survey and provide any general comments there.

A.3 Instructions

If you have any written materials providing requested details on any question, please attach a copy of those materials with your response.

For example, if you have a list of numerical codes for different properties where fire might occur, please include the list.

If you have a list of definitions that are always or usually used when reporting fires, please include that list.

A.4 Survey Questions

A. Overall methods of estimation

1. Which types of databases are used in developing your national fire statistics (check all that apply)?

   _____ Database with individual records for each captured incident

   _____ Database with summary information from individual reporting units (such as number of fires reported by a city, county or fire department)

   _____ Other (please specify): _____

2. Which methods are used in developing your national fire statistics (check all that apply).

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_____ Counting, tabulation of records

_____ Statistical projection (records are treated as a sample of all records)

_____ Adjustment for fires not reflected in any records (such as estimation of monetary fire loss in uninsured properties when records are collected by insurance companies)

_____ Other (please specify): _____

3. If you consider who provides the details that are included in the fire reports, what percentage of reported fires have details provided by the following types of people?

a. Professionals with extensive formal training in fire investigation

_____ All or nearly all (90-100%)

_____ Most (60-89%)

_____ Roughly half (41-59%)

_____ Some (11-40%)

_____ Few or none (0-10%)

b. Other professionals but without extensive formal training in fire investigation, such as firefighters or claims adjusters

_____ All or nearly all (90-100%)

_____ Most (60-89%)

_____ Roughly half (41-59%)

_____ Some (11-40%)

_____ Few or none (0-10%)

c. Non-professionals such as the people who owned or occupied the place where fire occurred

_____ All or nearly all (90-100%)

_____ Most (60-89%)

_____ Roughly half (41-59%)

_____ Some (11-40%)

_____ Few or none (0-10%)

B. Types of loss

4. Unwanted fire suitable for reporting

a. How do you define fires that should be reported? _____ _____ _____

b. How do you define fires that need not be reported (for example, a fire with no property damage or with damage less than a defined threshold)? _____ _____

c. What is the source of your national data on unwanted fires? (check all that apply)

_____ Fires reported to fire brigades or fire departments

_____ Fires reported to coroners, vital records or health departments

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_____ Fires reported to insurance companies

_____ Other (please specify): _____

_____ Not collected at the national level

d. What kinds of fires should be reported but often will not be reported because of limitations of the data source identified in your answer to Question 4c? (for example, fires not reported to fire brigades, fires with property damage less than an insurance deductible)

e. What other kinds of fires should be reported but often will not be reported, and why?

5. Death due to fire (excluding fire brigade and other emergency responders).

a. How do you decide that a death was caused by fire? (please indicate the definition you use)

b. What is the source of your national data on deaths due to fire? (check all that apply)

_____ Deaths reported to fire brigades or fire departments

_____ Deaths reported to coroners, vital records or health departments

_____ Deaths reported to insurance companies

_____ Other (please specify): _____

_____ Not collected at the national level

c. What kinds of deaths caused by fire are likely to be categorized as non-fire deaths and omitted from the reporting? (for example, death in a fire caused by an earthquake if all such deaths are attributed to the earthquake)

d. What kinds of deaths NOT caused by fire are likely to be included in the reporting? (for example, death due to trauma in an automobile collision where there was also a fire)

e. What kinds of deaths caused by fire are likely to be missed in the reporting because of limitations of the data source (for example, death in a clothing fire where the fire was not large enough to be reported to a fire brigade)

f. What other kinds of deaths caused by fire are likely to be missed in the reporting, and why? (for example, a death that occurs months or years after the initial fire injury)

6. Injury due to fire (excluding fire brigade and other emergency responders).

a. How do you decide that an injury was caused by fire? (please indicate the definition you use)

b. What kinds of injuries due to fire are intentionally excluded? (for example, injuries that are not medically attended, injuries not due to fire effects but sustained while attempting to escape, injuries that result in no lost time from work or other normal activities)

c. What is the source of your national data on injuries due to fire? (check all that apply)

_____ Injuries reported to fire brigades or fire departments

_____ Injuries reported to vital records or health departments

_____ Injuries reported to insurance companies

_____ Injuries reported as workplace injuries

_____ Other (please specify): _____

_____ Not collected at the national level

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d. What kinds of injuries caused by fire are likely to be categorized as caused by something other than fire and omitted from the reporting? (for example, injuries in a fire caused by an earthquake if all such injuries are attributed to the earthquake)

e. What kinds of injuries NOT caused by fire are likely to be included in the reporting? (for example, injury due to trauma in an automobile collision where there was also a fire)

f. What kinds of injury caused by fire are likely to be missed in the reporting because of limitations of the data source (for example, injury in a clothing fire where the fire was not large enough to be reported to a fire brigade)

g. What other kinds of injuries caused by fire are likely to be missed in the reporting, and why? (for example, an injury that the victim discovers only after the fire brigade has closed their report and departed, fire injuries that are or appear to be jointly caused by fire and an unrelated pre-existing condition, such as heart disease)

7. Direct damage to property due to fire effects

a. How do you define damages that are caused by fire and should be reported? _____ _____ _____

b. How do you define damages that are caused by fire but need not be reported (for example, a fire with no property damage, a fire with very little monetary damage that is less than a defined threshold)? _____ _____ _____ _____ _____

c. What is the source of your national data on damages in unwanted fires? (check all that apply)

_____ Fires and damages reported to fire brigades or fire departments

_____ Fires and damages reported to insurance companies

_____ Other (please specify): _____

_____ Not collected at the national level

d. How is damage counted and measured (check all that apply)?

_____ Monetary value of loss

_____ Indoor area damaged (for example, square meters in a building)

_____ Outdoor area damaged (for example, acres in a wildfire)

_____ Percentage of total area that was damaged

_____ Number of rooms damaged

_____ Number of floors damaged

_____ Number of buildings, structures or vehicles damaged

_____ Other (please specify): _____

_____ Not collected at the national level

e. What kinds of fire damage should be reported but often will not be reported because of limitations of the data source? (for example, fires not reported to fire brigades, fires with property damage less than an insurance deductible)

f. What other kinds of fire damage should be reported but often will not be reported, and why? (for example, less visible damage such as smoke effects on sensitive or vulnerable property)

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8. Other types of fire loss

a. What other types of fire-related loss do you record or estimate (check all that apply)?

_____ Deaths and injuries of firefighters, fire officers, fire brigade personnel, and other emergency responders due to acute fire effects

_____ Other fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders sustained while on-duty

_____ Fatal or non-fatal injuries or illnesses of firefighters, fire officers, fire brigade personnel, and other emergency responders due to chronic illness or other possible effects of long-term exposure to fire effects

_____ Costs of business interruption, including business closure and other loss of mission continuity

_____ Costs of temporary housing or other arrangements made necessary while permanent repair or replacement of fire-damaged property is underway

_____ Other types of indirect loss (please specify): _____
_____

_____ Environmental damage

_____ Damage to cultural heritage

_____ Other (please specify): _____

b. For each type of loss you checked above, how do you define that loss and are there any criteria or thresholds for loss that should be reported and loss that need not be reported?

c. What is the source of your national data on other types of loss? (check all that apply)

_____ Fires reported to fire brigades or fire departments

_____ Fires reported to coroners, vital records or health departments

_____ Fires reported to insurance companies

_____ Other (please specify): _____

C. Characteristics of fires or victims of fire

9. Locations of fire

a. Which of the following types of fire locations do you identify <u>separately</u> in your national statistics (check all that apply)? If there are groups of the following categories that you do not distinguish from each other but do distinguish from all other categories, please so indicate (for example, all vegetation areas are grouped together, or all outdoor areas are grouped together)

_____ Buildings (Please list any parts of buildings that are counted separately, such as chimneys or garages: _____
_____

_____ Structures other than buildings (for example, bridge, tunnel): _____ _____
_____

_____ Vehicles

_____ Crops, commercial forests, or other outdoor vegetation areas for which the vegetation has commercial value

_____ Other outdoor locations with commercial value (for example, outdoor storage, recreational areas and tourism sites outside structures)

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_____ Outdoor vegetation areas with no commercial value (for example, brushlands in a developed area)

_____ Other outdoor locations with no value (for example, trash bins, loose rubbish)

_____ Other (please specify): _____

Please indicate how you define each of the above groups. ***Please attach any lists with more detailed groups and categories of locations you use, as well as associated definitions.***

c. Which residential properties are reported separately?

_____ Separate reporting of single family dwellings, buildings with multiple private housing units, and commercial residential properties, such as hotels, dormitories

_____ All residential properties reported together but distinguished from other buildings

_____ All buildings with private housing units reported together but distinguished from other buildings

_____ Other (please specify): _____

10. Cause-related characteristics of fire

a. Which of the following fire characteristics related to fire cause do you include in your fire reporting and fire statistics (check all that apply)? ***Please attach any lists with more detailed groups and categories of these characteristics that you use, as well as associated definitions.***

_____ Whether the fire was deliberately started

_____ Whether the fire was due to natural causes

_____ Whether the fire was due to exposure from another fire

_____ Heat source

_____ When equipment is the heat source, type of equipment

_____ Initial item ignited, described by function (for example, bedding or trash)

_____ Initial item ignited, described by composition (for example, paper or plastic)

_____ Factors in initial ignition (such as mechanical or electrical failure or malfunction, behavioral error or oversight)

_____ First major fuel package ignited

_____ Factors in fire growth or flame spread (such as burning properties of room linings, absence of walls or other area separations)

Please indicate how you define each of the above groups. ***Please attach any lists with more detailed groups and categories of locations you use, as well as associated definitions.***

Do you provide separate reporting on fires that were deliberately started (arson, intentional, incendiary)? _____ Yes _____ No

If yes, please provide additional detail on your specific practices. Please check all that apply.

_____ Loss measures reported: ____ Fires, ____ Deaths, ____ Injuries, ____ Direct property damage, ____ Temporary lodging, ____ Business interruption, ____ Deaths or injuries to fire brigade

_____ For purposes of statistical estimates, some fires are classified as deliberate by trained arson investigators

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_____ For purposes of statistical estimates, some fires are classified as deliberate by fire officers on the scene with no arson training

_____ For purposes of statistical estimates, some fires are classified as deliberate by police or other law enforcement personnel

_____ For purposes of statistical estimates, some fires are classified as deliberate by insurance investigators or other insurance personnel

_____ Some fires are categorized as suspicious. If yes, are suspicious fires included in estimates of total deliberate fires? _____ Yes _____ No

_____ Some fires with unknown cause or cause still under investigation are included in estimates of total deliberate fires

_____ Some fires are categorized as playing with fire. If yes, are fires caused by playing included in estimates of total deliberate fires? _____ Yes _____ No

_____ Intentional fires are categorized as to motive or circumstances. If yes, indicate which of these categories are used: _____ Arson for profit, _____ Arson during riot or social disturbance, _____ Arson by juveniles (children), _____ Arson due to mental or emotional illness

b. Excluding fires that were deliberately set, which of the following causes of fire do you distinguish (show separately) in your fire reporting and fire statistics (check all that apply)?

_____ Playing with fire

_____ Smoking materials, excluding lighting implements such as match, lighter

_____ Smoking materials including lighting implements

_____ Heating equipment, excluding cooling equipment

_____ All HVAC equipment combined, including heating and cooling equipment (for example, fan or air conditioning)

_____ Cooking equipment, excluding other food preparation and handling equipment (for example, refrigerator, freezer, dishwasher, garbage disposer)

_____ Cooking equipment combined with other food preparation and handling equipment

_____ Appliances, all combined

_____ Appliance other than heating and cooking equipment, all combined

_____ Entertainment equipment (for example, television, radio)

_____ Office-type equipment (for example, computer)

_____ Clothes dryer (with or without clothes washer)

_____ Match, lighter, other open flame all combined

_____ Match, lighter, candle, all separate

c. For each cause you checked off above, how do you define those fires?

Please attach any lists with more detailed groups and categories of causes that you use, as well as associated definitions.

11. Fire protection systems and features

a. Which of the following fire protection systems do you address in your fire reporting and fire statistics (check all that apply)?

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Please attach any lists with more details on what you include and what specifics you report.

_____ Sprinklers and other automatic extinguishing equipment (Please provide details on distinctions you capture such as type of extinguishing agent)

_____ Smoke alarms, smoke detectors, and other automatic detection equipment (Please provide details on distinctions you capture, such as what fire characteristics are detected, type of power)

_____ Fire extinguishers or other manual extinguishing equipment (Please provide details on distinctions you capture, such as type of extinguishing agent)

_____ Smoke management or smoke control equipment (Please provide definitions and details captured)

b. Which of the following fire protection features do you address in your fire reporting and fire statistics (check all that apply)?

Please attach any lists with more details on what you include and what specifics you report.

_____ Type of construction (Please provide definitions of construction types that you use)

_____ Fire doors, fire walls, and other elements of compartmentation (Please provide definitions of types you define and group and other terms you use, such as open or traditional office architecture)

c. Which of the following types of fire suppression equipment used by fire brigades and fire departments do you record in your fire reporting and fire statistics (check all that apply)?

Please attach any lists with more details on what you include and what specifics you report.

_____ Fire hoses (Please indicate what is recorded)

_____ Fire extinguishers (Please indicate what is recorded – type, size, characteristics, and number used)

_____ Other firefighting equipment (Please indicate what is recorded – type, size, characteristics, and number used)

12. Victim characteristics

a. Which characteristics of injury victims are reported?

Please attach any lists with more detailed groups and categories of these characteristics that you use, as well as associated definitions.

_____ Victim age

_____ Victim gender

_____ Victim race

_____ Victim disabilities, limitations and impairments

_____ Victim location (either at ignition, when injured, or when discovered)

_____ Victim activity when injured

_____ Type of injury, for example, burns vs. smoke inhalation

_____ Severity of injury

_____ Victim behaviors that contributed to injury or escape

_____ Part of body injured

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14. Other fire characteristics

a. Which of the following fire characteristics do you include in your fire reporting and fire statistics (check all that apply)?

Please attach any lists with more detailed groups and categories of these characteristics that you use, as well as associated definitions.

_____ Height of building (Please indicate how building height is defined and measured) _____
_____
_____

_____ Level or floor where fire began

_____ Structure status, such as vacant, under construction, or under demolition

_____ Age of building

_____ Type of company occupying building, such as retail vs. wholesale, as distinguished from primary use of the building, such as sales vs. manufacturing vs. storage

15. Other comments

a. Are there any other features or characteristics of your data that you would like to describe?

(for example, do you record the status of the place where fire occurred relative to any fire safety programs, such as development and rehearsal of escape plans or time and findings of last fire-code inspection?)

Please attach any lists with more details on these characteristics, as well as associated definitions.

b. Are there any comments you would like to make regarding national fire incident data?

(for example, do you see any emerging data requirements or details that are becoming important and should be added to routine incident reporting?)

Please attach any lists with more details on these characteristics, as well as associated definitions.

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Annex B
(informative)

References and Resources

B.1 References

1 *Australian National Fire Incident Statistics, 1990-1991 and 1991-1992*, Australian Fire Authorities Council and CSIRO, Australia, December 1993.

2 *Canadian Code Structure on Fire Loss Statistics*, Council of Canadian Fire Marshals and Fire Commissioners, 2002.

3 Incident Recording System (IRS) Questions and lists https://www.gov.uk/government/publications/incident-recording-system-for-fire-and-rescue-authorities

4 *Incident Recording System (IRS) Help and Guidance*, UK Department of Communities and Local Government, Version 2.3, September 2011.

5 *National Fire Incident Reporting System: Complete Reference Guide*, FEMA, U.S. Fire Administration, National Fire Data Center, January 2012.

B.2 Resources – Websites with national fire statistics and analyses

1 Canada (statistics in 2007 and up through 2002): www.ccfmfc.ca

2 China: *Fire Statistical Yearbook of China* (available only in Chinese; cannot find website access)

3 Europe (and many other countries): www.ctif.org (Go to Statistics)

4 France (reported deaths only): www.cepidc.inserm.fr

5 France: www.interieur.gouv.fr (Go to Publications, then Statistics, then Civil Security)

6 Ireland: www.environ.ie (Go to Local Government, then Fire and Emergency Services, then Statistics)

7 Japan: *White Book on Fire Service in Japan*: http://www.fdma.go.jp/concern/publication/

(available only in Japanese)

8 Kenya: No source identified

9 (Republic of) Korea: www.kfpa.or.kr (Go to Korean fire data)

10 New Zealand: www.fire.org.nz

11 Russia: www.mchs.gov.ru (Go to Statistics)

12 United Kingdom (limited to Great Britain, hence excluding Northern Ireland, after 2008): www.gov.uk/government/organisations/department-for-communities-and-local-government/series/fire-statistics-great-britain

13 USA: www.nfpa.org (Go to Research, then either Fire statistics OR Statistical reports)

14 USA: www.usfa.fema.gov (Go to Statistics)

15 USA: www.cpsc.gov (Go to Library, then Injury Statistics, then Fire)

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Annex C
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Additional Detail on Coding in Japan

C.1 Classification of occupancy

Occupancy type coding		Designated occupancy (stricter requirements)	Major examples
1	a	yes	Theatre, movie theatre
	b	yes	Public hall, assembly
2	a	yes	Cabaret, nightclub
	b	yes	Game center, dance hall
3	a	yes	Restaurant (traditional Japanese style)
	b	yes	Restaurant (other than the above)
4		yes	Department store, supermarket
5	a	yes	Hotel, motel, lodging place
	b	-	Dormitory, hostel, apartment
6	a	yes	Clinic, hospital, maternity home
	b	yes	Nursing home, elderly welfare center, aid station, rehabilitation facility, rehabilitation facility for the handicapped (where more than half of tenants are mobility impaired)
	c	yes	Preschool, kindergarten, school for the blind or deaf, school for the physically handicapped or mentally retarded
7		-	Elementary/junior high/high school, college, university, vocational school, other school
8		-	Library, museum
9	a	yes	Steam bathhouse, sauna
	b	-	Public bathhouse
10		-	Railway station, airport terminal
11		-	Temple, church
12	a	-	Factory, workshop
	b	-	Movie studio, TV studio
13	a	-	Parking garage
	c	-	Airship hangar, aero-shed
14		-	Storage
15		-	Work place other than those mentioned previously
16-1	a	yes	Mixed occupancy having designated occupancies such as 1 to 4, 5-1, 6, 9-1
	b	-	Mixed occupancy other than the above
16-2		yes	Underground shopping arcade
16-3		yes	Underground floor of a building facing the above shopping arcade
17		-	Designated important cultural heritage

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Occupancy type coding		Designated occupancy (stricter requirements)	Major examples
18		-	Shopping arcade whose length is 50m or more
19		-	Forest
20		-	Ship

C.2 Causing process

Main category	Breakdown of main category
Heat generation by an electric cause	Partial disconnection
	Electric leakage
	Short circuit
	Mixed touch
	Overcurrent
	Spark
	Overheat of the metal contact part
	Static spark
	Insulated degradation
	Others
Heat generation by a chemical cause	Explosion
	Sudden chemical reaction
	Heat generation by contamination of foreign substances
	Gas blowout
	Ignition by a spark
	Flash ignition
	Spontaneous combustion
	Mixed touch of chemicals
	Others
Heat generation by a thermal cause	Boiling and overspill of combustibles
	Recombustion
	Ignition by a residual heat
	Friction heating
	Ignition in response to radiation.
	Touching of high-temperature substance
	Heated by conduction (1)
	Overheat
	Others

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Main category	Breakdown of main category
Touching of fire source and combustible materials by movement	Falling down of combustibles on fire source
	Moving of combustibles and touching fire source by combustibles
	Fire source spilling from container
	Fry of high-temperature droplet
	Flying sparks
	Spark
	Falling of fire source
	Moving and touching of fire source
	Others
Due to defective material or structure of devices and machines	Breakage, Corrode
	Mechanical failure
	Inferior design
	Inferior material
	Inferior paint
	Leakage of fire source
	Leakage of combustibles
	Breakage or corrode of container
	Others
Improper use of equipment	Unintentional switch-on
	Inadequacy in tuning the machine
	Stoking up too much
	Wrong use
	Being left at inappropriate place
	Untreated, Forgotten
	Being used inappropriately other than for the original purpose
	Insufficient treatment of embers
	The appliance which was put away with inflammables
	Others
Fire on means of transportation	Ignition by collision
	Ignition by crackup
	Backfire
	Others
Fire caused by natural phenomenon	Damage of house due to earthquake
	Damage of house due to strong wind
	Ignition of water prohibitive substance due to flood
	Lightning
	Others

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Main category	Breakdown of main category
Intentional fire	Arson
	Suspected arson
	Playing with fire
	Setting a fire unconsciously other than arson, playing with fire
	Others
Unknown	Unknown

C.3 Location of fire origin

Type of fire	Main category	Breakdown of main category
Structure fire	Rooms for dwelling	Living room
		Drawing room
		Study room
		Reading room
		Bedroom
		Closet, storage room
		Dining room
	Common space	Entrance
		Hall
		Corridor
		Stair
		Balcony
		Kitchen
		Staircase
		Changing room
		Dressing room
		Locker Room
		Bathroom
		Lavatory
		Wash place
		Toilet
		Hot-water service room

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Type of fire	Main category	Breakdown of main category
Structure fire	Working spaces	Manufacturing plant
		Processing plant
		Repair shop
		Paint plant
		Drying room
		Machine operation room
		Packaging room
		Room for receipt of goods
		Shipping room
		Engineering works room
		Cooking place
		Stage
		Platform stage
		Studio
		Theatre basement
	Mechanical room	Dust chamber
		Dust chute
		Annexed incinerator room
Structure fire	Facilities room	Stokehold
		Boiler chamber
		Switchboard room
		Transformer room
		Generator room
		Capacitor room
		Projection room
		Illumination room
		Broadcasting room
		Correspondence room
		Signal room
		Telephone
		Switch room
		Machine room
		Engine bay
		Air conditioning machine room
		Elevator
		Escalator
		Luggage lift
		Duct space

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Type of fire	Main category	Breakdown of main category
Structure fire	Storage	Ordinary storage
		Garage
		Indoor parking area
		Hangar
		Boat house
		General warehouse
		Freezing compartment
		Barn
		Hazardous material storage
	Commercial spaces	Merchandising store
		Service store
		Shops serving food and drink
		Bar room
		Seat of the restaurant
		Game hall
		Audience seats
		Hotel room
	Medical profession	Consultation room
		Operation room
		Artificial room
		Treatment room
		Laboratory such as X-rays
		Pharmacy room
		Rehabilitation, a recreation room
		Patient’s bedroom

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Type of fire	Main category	Breakdown of main category
Structure fire	Office room	Office a private basis
		Reception room
		General office room
		Meeting room
	Room for academic use	Research laboratory
		Exhibition room
		Library room
		Reading room
		Classroom
		Gymnastic room
		Lounge
		Break room for working staff
	Security guards room	Front counter
		Night duty room
		Security guards room
		Building manager room
	Empty house etc.	Empty house
		Vacant room
		Building under construction
		House for raising domestic animals
	Exterior	Rooftop
		Porch, Balcony
		Attic, Ceiling
		Inner side of wall
		External wall
		Underfloor
		Penetration part
		Others
Forests fire	Forests fire	Wilderness
		Pastureland
		Natural forest
		Planted forest

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Type of fire	Main category	Breakdown of main category
Fire of means of transportation	Cars, trains, vessels, aircrafts	Engine room
		Driver's cabin
		Driver's seat
		Cockpit
		Front passenger seat
		Crew's room
		Passenger cabin
		Passenger seat
		cookroom
		Periphery
		Others
Others	Other than building, forests, vehicle, vessel, aircraft	Telephone pole
		Wiring
		Pole transformer
		Transformation installation
		Gate
		Fence
		Wall
		Mailbox
		Advertising pillar
		Neon billboard
		Advertising display
		Tower
		Wharf
		Pier
		Sunshade
		Arcade
		Storage of hazardous materials
		Others

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Type of fire	Main category	Breakdown of main category
Others	Road, Vacant ground	Road
		Car-track lane
		Tunnel
		Underground passage
		River bed etc.
		Water surface
		Vacant ground
		Landfill
		Field
		Park
		Cemetery
		Golf course
		Athletic field
		Outdoor material storage space
		Garbage depot
		Others
Unknown	Unknown	Unknown

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