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Fires and related incidents in Dubai, United Arab Emirates (2006–2013)

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ABSTRACT

Fire incidents in Dubai, United Arab Emirates, reported to the Forensic and Mechanical Engineering section of the Dubai Police Forensic Laboratory during 2006–2013 were reviewed. A detailed examination of more than 5000 incidents, representing a wide range of fire types is presented. Statistical comparisons on the type of incident and the cause and origin of the fire have been evaluated. City areas covered by each police station are also identified. The outcomes of the study indicate that more than one third of the total number of incidents involved motor vehicles and these accounted for more than half of all deliberately set fires in Dubai. A further one third of the incidents reviewed were in residential units. Electrical failures were shown to pose the highest risk of accidental fire and the Bur Dubai Police Station was the busiest in terms of fire investigation caseload.

Introduction

Fire safety has always been a critical issue and concerns are growing in the Middle East in relation to building damage. Dubai is home to hundreds of high-rise buildings, constructed using a variety of flammable materials generating concern in relation to fire safety. Recent national codes have begun to address fire safety in particular risk to life and protection of property, however many existing buildings may not comply with these codes. The selection of suitably flame-retardant building materials is also important in structural design.

Typical fire development occurs over four consecutive stages: Incipient, Growth, Fully Developed and Decay [1]. It is important not to underestimate the behaviour of fire and the different characteristics of each stage. Despite the provision of new active control technologies, such as sprinkler systems and smoke detectors, full fire prevention can still not be achieved. These preventive measures may only be effective in the pre-flashover stages of a developing fire [1] and become ineffective as the fire develops to flashover and steady burning, where the involvement of fire fighters becomes critical.

The Forensic and Mechanical Engineering section of the Dubai Police Forensic Laboratory (DPFL) is the principal source for fire statistics in the emirate. The data shown in this study only corresponds to incidents which were attended by DPFL. DPFL provides reports describing the origin and possible causes of each fire.

The Dubai Municipality assesses the effects of fire on existing building materials and the reports from agencies can be presented as evidence in the courts. The current work presents an evaluation of fire trends in Dubai as reported by the DPFL across the period 2006–2013.

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Data collection

The cases reported in this review occurred during the period 1 January, 2006 to 31 December, 2013 and which were examined by the Forensic and Mechanical Engineering section at the DPFL [2]. Data was gathered through reference to the reports produced by the DPFL where the nature of the incidents have been subdivided into a variety of groups presented in Table 1.

Fire deaths and injuries are reported through the Directorate General of Civil Defence, in Dubai, and include only cases which were attended by the Fire and Rescue services [3].

The total number of deaths and injuries over the 8-year period were 112 and 361 respectively, the highest number of deaths being in 2010 (30) and the highest number of non-fatal injuries being in 2008 (87). This data is presented in Fig. 1.

It should be noted that DPFL covers the emirate of Dubai and, occasionally, the Northern Emirates, excluding the capital emirate, Abu Dhabi, which is served by its own forensic services [4]. Incidents known to have occurred, but not classified in a specific category, have been presented as 'Others'. A description of the most common incidents, or those of particular interest, within each category follows.

Results and discussion

Number of fires per year (2006–2013)

The overall number of declared fire incidents for the period 2006–2013 was 5490 and the annual data is presented by year in Fig. 2. The highest number of fires on an annual basis was of 838 in 2008, dropping to between 618 and 682 in subsequent years.

Table 1
Number of fire incidents in Dubai, UAE, from 1/1/2006 to 31/12/2013.

Type of event	2006	2007	2008	2009	2010	2011	2012	2013	Total	%
Motor vehicles	268	269	295	243	255	238	235	266	2069	37.7
Residential units	174	224	249	177	142	170	223	190	1549	28.2
Commercial stores	94	60	87	75	89	63	80	94	642	11.7
Industrial plants/storage places	50	60	83	53	57	43	47	35	428	7.8
Construction sites	15	31	44	28	14	17	14	8	171	3.1
Electrical sign boards	19	11	23	24	19	19	21	16	152	2.8
Government establishments	8	5	5	7	18	9	10	11	73	1.3
Ships and boats	6	9	6	11	9	12	8	6	67	1.2
Used tyres and solid waste	6	7	6	5	1	10	12	5	52	0.9
Self-immolation	2	7	6	10	7	1	8	4	45	0.8
Others	29	39	34	27	39	36	24	14	242	4.4
Total	671	722	838	660	650	618	682	649	5490	100.0

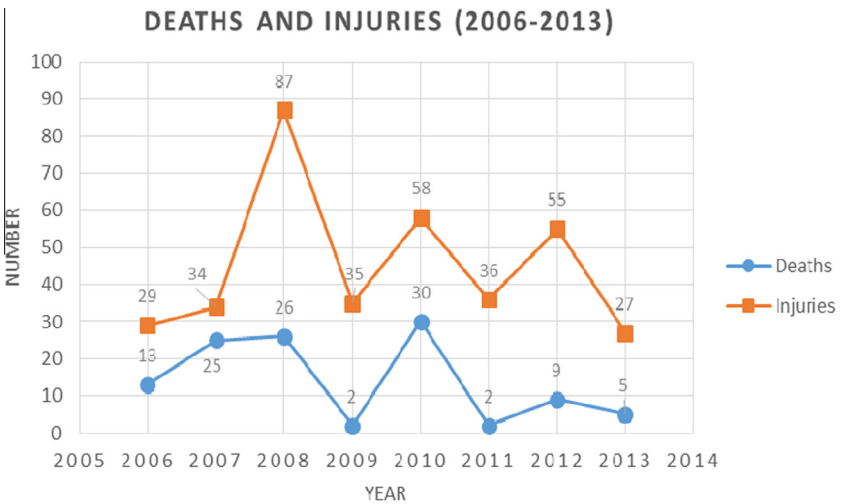

Fig. 1. Deaths vs. injuries in Dubai for the period 2006–2013.