TREES & THE LAW

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Are trees really risky?

A review of tree-caused fatalities and injuries to the general public.

Every time a person is killed by a falling tree or branch, the media reports cover a range of perspectives. Often, that includes the suggestion that more and better tree care and risk assessment work is required.

In an effort to better identify how many people are actually killed or injured by trees, a multi-year project was set up to document fatalities and injuries. A pilot project was started in 2007 using Google Alerts with several groups of keywords, to see which words or phrases yielded the most responses. These alerts were set up to scan any news items written in English, anywhere in the world, for possible matches. The results were used to refine the keywords and phrases. From 2008, to 2011 a steady stream of daily reports were analysed and the data compiled. The focus was on tree fatalities and injuries that occur to people not working in the area of forestry, and arboriculture. All reports associated with workers, whether they were professional or laypeople were excluded.

Several thousand news items were collected and analysed. The number of incidents documented increased dramatically from 2008 to 2009, and doubled to 2010. The number of countries reporting incidents also dramatically increased between 2008 and 2010, although 2010 and 2011 were roughly similar. Table 1 shows these results.

Table 1. Four year summary.

Year	killed by tree	injured by tree	killed by limb	injured by limb	# of incidents	total killed	total injured	# of countries
2008	47	9	11	5	60	58	14	5
2009	93	62	20	30	96	113	92	21
2010	139	158	28	39	203	167	197	35
2011	187	190	33	82	250	220	272	34

Of these results, it is notable that the bulk of the reports are consistently located in the United States. Table 2 shows the top three countries, ranked by total number of people killed, over the four year time frame.

Table 2. Top Three Countries by year.

Year	Country	# killed	# injured	# of incidents
2008	United States	44	6	48
	United Kingdom	5	0	5
	Canada	3	4	6
2009	United States	63	52	89
	United Kingdom	9	8	15
	India	6	11	6
2010	United States	75	96	129
	India	21	25	21
	Philippines	11	8	6
2011	United States	118	124	88
	India	28	34	24
	Philippines	12	0	7

The number of incidents involving whole tree failure, as opposed to limb failure was also analysed see Table 3.

Table 3. Summary of injuries and fatalities

year	% of all fatalities caused by whole tree	% of all injuries caused by limb
2008	77	44
2009	78	52
2010	80	75
2011	82	57

The most common incident is trees or limbs falling on passing vehicles.

The number of incidents documented, and countries reporting, increased over the four year period, suggesting perhaps that Google's ability to locate and analyse news has improved, and also that more news source are coming on line. The number reported for the United Kingdom is approximately similar to previous reports of about seven fatalities per year.

The percentage of fatalities caused by whole tree failure is remarkably constant across all four years, suggesting that death is more likely to be caused by the whole tree failing. The percentage of incidents involving injury by whole tree failure was less constant.

Looking at the causes of the incidents, almost all are related to adverse weather events, either during the event or within a week or so after the event as destabilised trees and limbs finally fall down. Very few incidents occur on a calm day, though they do happen. The most common form of failure is due to strong wind, often in combination with heavy rainfall. There are also incidents of relatively low velocity wind but heavy rainfall. The most common incident is trees or limbs falling on passing vehicles. Less common are incidents where trees fall on homes, followed by incidents involving pedestrians. Vehicles, trains, cars, trucks, motorcycles and bicycles, striking fallen trees or partly uprooted trees comprise a small number of incidents.

Near misses seem to make the news quite often but were not documented, because the details were usually very sparse and not consistent. For example, some reports of near misses involve trees several hundred feet away, others only a few inches away.

Overall, the numbers are very low suggesting that the risk of being killed or injured by a tree is very low, when compared to the many other risks affecting society. More importantly, these risk numbers must be seen in context. In the major storm events, similar numbers of people are killed in traffic accidents, flooding, or collapsing buildings. Compared to other event types, such as lightning strikes, trees pose relatively little risk. Many more people are killed each year by lightning strikes. In the United Kingdom about 30 people a day are killed in car accidents. In the United States it is about 100 people a day.

Which is not to say that tree risk assessment programmes can be ignored. In principle, it seems entirely reasonable to accept that a well developed and implemented risk assessment process will help to reduce the number of extreme or unacceptably high risk trees in urban areas. There are many examples in the news reports where clearly obvious structural issues can be seen in the failed trees, and it often does appear that a competent assessment would have been able to detect the issue prior to failure. But risk managers and the general public also need to appreciate that some of the trees or limbs that fail and cause death or injury were in fact, quite healthy at the time of failure. They were simply overloaded by adverse weather. For these and less readily obvious problems, it is highly likely that even a competent risk assessment might not be able to anticipate the problems accurately.

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It also needs to be understood that not all of the incidents occur in areas where an assessment would be undertaken under any reasonable standard of care, such as rural roads and backcountry areas. Similarly, it must be understood that standard risk assessment work is undertaken for typical weather conditions, not major ice storms, tornadoes or hurricanes, where the associated property damage is often extreme and the tree failures almost incidental.

Overall, the numbers are very low suggesting that the risk of being killed or injured by a tree is very low when compared to the many other risks affecting society.

Perhaps more importantly, the cost of compensation for fatalities and serious injuries are commonly in the order of several million dollars per incident. While the chances of these events are low, the costs associated with them are high, suggesting that the costs of an effective risk assessment and management regime are a worthwhile investment compared to the costs of a payout.

The use of an effective risk assessment and risk management protocol is one way to reduce the likelihood of incidents leading to fatalities or property damage. But, there are no guarantees that all incidents are preventable in all circumstances and, as the data so far have shown, extreme weather events bring risks of many kinds, some of which are difficult to predict with any accuracy. ❖