

PERSPECTIVE

The epidemiology of international terrorism involving fatal outcomes in developed countries (1994–2003)

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Abstract. We aimed to describe the public health burden and epidemiology of international terrorism (i.e. involving foreign nationals) with fatal outcomes in developed countries. Data was abstracted from a United States Department of State database for 21 ‘established market economy’ countries and 18 ‘former socialist economies of Europe’ for 1994–2003. To put the findings in a wider context, comparisons were made with WHO data on all homicides for each country. A total of 32 international terrorist attacks causing fatalities were identified over the 10-year period. These resulted in 3299 deaths, giving a crude annual mortality rate of 0.3 per million population. The mortality burden attributable to international terrorism in these countries was 208 times less than that attributable to other homicide. Even for the

country with the highest mortality burden from international terrorism (the United States), this ratio was 60. There was no statistically significant trend in the number of attacks over time, but the attack severity (in terms of deaths per attack) was higher in the latter part of the 10-year period. A number of limitations with this data set were identified. If a more rigorous definition of ‘international terrorism’ was used, then this would substantially reduce the total number of such attacks defined in this way. In conclusion, there is a need for better quality data and improved classification systems for describing international terrorism. Nevertheless, the available data indicates that the mortality burden from international terrorism in developed countries is small compared to that from other homicide.

Introduction

There has been substantial political, media and public concern over international terrorism, particularly since the attack of 11 September 2001 in the United States. This has prompted a large investment in anti-terrorist measures, including public health measures relating to bioterrorism protection [1, 2]. Such concern over international terrorism arises from the adverse impacts on those directly affected (via deaths and injury) and the wider societal impacts that include psychological sequelae [3] and adverse economic impacts [4]. Nevertheless, given the spending of public health and other public resources on addressing the potential effects of international terrorism, it is important for the basic descriptive epidemiology to be clarified so that policy-making is appropriately informed.

Methods

Countries covered

The countries covered in the analysis were those with a population of over one million and defined as ‘established market economies’ (n = 21) or ‘former socialist economies of Europe’ (n = 18) (as defined

in an international mortality study [5]). These countries are those with the best quality of data both for mortality from international terrorism and from homicide.

US State Department data

Data on international terrorist attacks involving any deaths among non-perpetrators were obtained from the annual reports of the Counterterrorism Office of the US Department of State [6] (for attacks in the most recent 10-year period: 1994–2003). The definition of terrorism used by the Department is: ‘*Premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents*’, with international terrorism meant as ‘*terrorism involving citizens or the territory of more than one country*’. The data for the most recent 10-year period was selected since this is the most relevant for describing the current epidemiology, and for informing potential policy responses.

Supplementary data

To obtain more precise data on some of the attacks, we undertook additional Medline searches for inci-

dents meeting the State Department definitions. These involved the search terms: 'terrorist or terrorism'; 'bomb or bombing'; 'assassination'; and the name of each country within the chosen groups (for the time period 1 January 1994–1 October 2004). This was assisted by examining recently published reviews of terrorist events in relevant countries in an issue of the journal *Prehospital Disaster Medicine* (April–June 2003).

If there were no confirmatory or additional details in Medline-indexed articles, our next step was to search the website of the BBC news [7] followed by more general Internet searches (using the search engine Google).

Population denominator data and comparison data

The calculation of the average annual mortality burden for each country and region was based on the most recent population data for each country from the World Health Organization (WHO) website [8]. Comparison data on other homicides were obtained for each country from a WHO report that used data for the most recent year available up to year 2000 [9]. Even though some terrorist activities are usually focused on certain states or provinces of some countries (e.g. Chechnya), national population data was used for calculating rates given the small number of fatal attacks identified, to facilitate comparisons with homicide data, and because policy responses tend to be at a national level.

Data classification

In the main analyses, only the deaths of victims were included, not the deaths of perpetrators. The nationalities of foreign nationals killed were collected, including those for whom dual citizenship was reported. Classification systems were developed to describe the presumed targeting of the attack and the type of underlying conflict associated with the attack.

Results

Data sources on attacks

For the selected countries, the US State Department detailed 32 attacks with fatal outcomes for non-perpetrators in this 10-year period. Additional information was available from other sources for 91% (29/32) of the attacks. These include Medline sources (16%) and BBC news online (53%). For the remaining attacks, information could be obtained from other Internet-based news sources for 12 out of 15 of the attacks (e.g. from CNN, and other news services identified in Google searches). This addi-

tional and more detailed information resulted in changes to the total number of deaths of victims (as recorded by the State Department) in 16% of attacks.

The additional searches also resulted in the identification of eight additional attacks ($n = 12$ deaths) that appear to fit the US State Department definition of international terrorism and for which there is fairly detailed documentation (see Appendix – Table A1). Given these findings, the sensitivity of the US State Department data collection system for events involving fatal outcomes was estimated to be 80% for these countries in this 10-year period (32/40). However, we excluded these eight additional attacks from the subsequent analyses, since our focus was on the epidemiology of international terrorism as indicated by the State Department data source.

Nature of the attacks

Out of the 32 attacks, the most common form of attack involved armed attack (50%), followed by bombing (38%) (Table 1). For two arson attacks, one bombing attack, and the attack using aircraft (i.e. on 11 September 2001 in the United States), multiple locations were involved. No biological, chemical or radiological weapons were used in any of the attacks. However, a chemical agent was used in a rescue attempt by Russian authorities as part of a Moscow theatre siege [10].

A majority of attacks (69%) involved some degree of targeting in terms of particular groups (31% of attacks), prominent individuals (25%) or a mix of symbolic facility and a particular group (13%). Only 25% of attacks appeared to be targeted at the general public (i.e. attacks in public places and public transport settings that were not associated with a symbolic facility, symbolic event or a particular group).

Distribution over time

The *number* of attacks was nearly double in the first 5-year period (compared to the subsequent 5-years) and peaked in 1996 (Table 2). However, this trend was not statistically significant. The deaths *per attack* were substantially higher in the more recent five-year period. This was result partly arose from attacks in 2002, but was very largely due to the 11 September 2001 attack in the United States.

Geographical distribution

France and Russia had the most attacks ($n = 7$ each). However, the United States had the highest mortality burden, with a crude rate of around one death per million population per year (due to the 11 September 2001 attack).

Table 1. Means of attack involved in fatal international terrorist attacks in developed countries (1994–2003)

Means of attack	Number of attacks	Percent	Locations involved (No.)
Armed attack ^a	16	50.0	16
Bomb/s	12	37.5	14
Arson or firebombing	2	6.3	5
Antitank missile	1	3.1	1
Mixed – planes crashed ^b	1	3.1	4
Total	32	100	40

^a A terrorist attack on a Moscow theatre also involved deaths attributed to the use of a toxic gas by Russian authorities in the rescue [10].

^b The attack on 11 September 2001 in the USA [11].

Table 2. Distribution of fatal international terrorist attacks and associated deaths in developed countries over time (1994–2003)

Year	Number of attacks	Percent of 10 year total	Total deaths	Mean deaths per attack
1994	1	3.1	1	1
1995	6	18.8	15	3
1996	9	28.1	19	2
1997	3	9.4	8	3
1998	2	6.3	33	17
1999	2	6.3	4	2
2000	4	12.5	5	1
2001	1	3.1	2969	2969
2002	4	12.5	245	61
2003	0	0.0	0	–
Total	32	100	3299	103

Deaths

For all the attacks collectively, there were 3299 deaths out of a total population of 1.19 billion, giving a crude annual mortality rate of 0.3 deaths per million population for these 39 countries collectively (Table 3). The median number of deaths per fatal attack was 1.5. The attack on 11 September 2001 comprised 90% of the total mortality burden for the 39 countries. Excluding this attack from the analysis gave a total crude annual mortality rate of 0.03 deaths per million.

Deaths among foreign nationals (including citizens of dual nationality) occurred in 23 attacks and comprised 2.3% of the deaths (76/3299). The death toll was highest for foreign nationals from the United Kingdom (n = 15), followed by Turkey (n = 9), and then Canada (n = 7). In addition to the total deaths of victims, there were 64 deaths of perpetrators (with these being excluded in the analyses presented in this analysis).

Comparison with homicide burdens

The ratio of annual homicide deaths to the annualised number of international terrorism deaths was 208 for all the countries with comparable data (Table 3). For countries reporting international terrorism deaths, the

ratio ranged from 60 to 10,880 with the median being 625. The lowest ratio was for the United States (i.e. at 60), despite this country having the highest homicide rate among established market economy countries.

Type of conflict involved

The major identifiable type of conflict to which the terrorist attacks were related was 'internal conflict' within that particular country (Table 4). There was only one attack that was solely part of a conflict between foreign nationals and the country in which the attack occurred (i.e. the attack by al-Qaeda on the United States on 11 September 2001).

Discussion

Limitations with this analysis and data set

We recognise that definitions of terrorism are variable and contentious [12–14]. This study used the US State Department's definition for 'international terrorism', which includes attacks that are probably better classified in other ways. For example the State Department's definition includes what appeared to be domestic terrorist attacks in which foreign nationals

Table 3. Distribution of fatal international terrorist attacks in developed countries by country (1994–2003) and comparison with the annual homicide burden

Country	Number of attacks (1994–2003)	Number of inter-national terrorism deaths (1994–2003)	Inter-national terrorism deaths (per 100,000 population per year)	Annual homicides (age standardised number) (WHO data)	Annual homicide rate (age standardised per 100,000 population) (WHO data)	Ratio of number of annual homicides to annualised international terrorism deaths ^a
<i>Established market economies</i>						
Australia	0	0	0	295	1.6	–
Austria	0	0	0	68	0.8	–
Belgium	0	0	0	169	1.6	–
Canada	0	0	0	431	1.4	–
Denmark	0	0	0	59	1.1	–
Finland	0	0	0	125	2.2	–
France	7	19	0.0032	436	0.7	229
Germany	2	3	0.0004	720	0.9	2400
Greece	3	3	0.0027	144	1.2	480
Ireland	0	0	0	30	0.8	–
Italy	0	0	0	720	1.1	–
Japan	0	0	0	719	0.6	–
Netherlands	1	6	0.0037	203	1.3	338
New Zealand	0	0	0	57	1.5	–
Norway	0	0	0	41	0.9	–
Portugal	0	0	0	118	1.1	–
Spain	1	1	0.0002	355	0.8	3550
Sweden	0	0	0	110	1.2	–
Switzerland	1	1	0.0014	77	1.1	770
United Kingdom	3	32	0.0054	440	0.8	138
United States	2	2970	0.1020	17,893	6.9	60
Subtotal	20	3035	0.0351	23,210	–	76
<i>Former socialist economies of Europe</i>						
Albania	0	0	0	660	21.0	–
Belarus	0	0	0	1123 ^b	10.5 ^b	–
Bosnia and Herzegovina	1	1	0.0024			^b
Bulgaria	0	0	0	238	2.6	–
Croatia	0	0	0	128	2.6	–
Czech Republic	0	0	0	151	1.4	–
Estonia	0	0	0	227	14.8	–
Hungary	0	0	0	291	2.6	–
Latvia	0	0	0	308	11.6	–
Lithuania	0	0	0	297	7.5	–
Macedonia	0	0	0	47	2.2	–
Poland	1	1	0.0003	1088	2.7	10,880
Romania	0	0	0	803	3.3	–
Russia	7	256	0.0178	33,553 ^b	21.6 ^b	1311 ^b
Serbia and Montenegro	3	6	0.0057			^b
Slovakia	0	0	0	132	2.3	–
Slovenia	0	0	0	30	1.3	–
Ukraine	0	0	0	6260	11.7	–
Subtotal	12	264	0.0080	45,336	–	1764 ^b
Total	32	3299	0.0276	68,546	–	208 ^b

^aThat is, the numbers in column 5 (annual homicides) divided by the numbers in column 3 (number of international terrorism deaths) after adjusting the latter to give annual averages.

^bThere was no homicide data from Bosnia and Herzegovina and from Serbia and Montenegro and this has been adjusted for in the total rates and ratios calculated.

Table 4. The apparent types of conflict underlying fatal international terrorist attacks in developed countries (1994–2003)

Apparent type of underlying conflict	Number of attacks	Percent
<i>Internal conflict</i> within the particular country where the attack occurred.	11	34.4
<i>Conflict in another country/countries</i> but where the terrorist attack appeared to be at least partly aimed at the government of the country in which it occurred ^a	5	15.6
<i>Conflict within another country/countries that was displaced</i> to the country where the attack occurred, and where the terrorist act was not directed at the government of the country in which it occurred ^a	3 ^b	9.4
<i>Conflict between foreign nationals and the country</i> in which the attack occurred ^a	1	3.1
Not relevant in that the incident was not clearly terrorism and appeared to be more appropriately described as <i>other homicide</i> .	4	12.5
Type of conflict was <i>unknown</i> as the evidence for a particular group or relevance to a political cause was too weak.	8	25.0
Total	32	100

^aOnly the attacks in rows 2 and 4, and one attack from row 3 would meet the more rigorous definition for international terrorism detailed in the discussion section.

^bIncludes two attacks that were displaced internal conflicts and one attack that appeared to be a displaced conflict between states (a South Korean diplomat killed in Russia by possible North Korean state agents).

are injured or killed – even when this outcome may be incidental. The Department also includes attacks where the cause may not necessarily relate to terrorist activity by a group, such as the actions of a lone individual with mental health problems. Finally, the State Department appears to include some events where the cause is unknown, where no group ever claimed responsibility, and where the motives might be primarily non-political (e.g. criminal activity). Such cases would be excluded if a more rigorous definition of ‘international terrorism’ was used. To meet the definitional issues outlined above, we suggest the following new definition:

International terrorism involves all of the following conditions:

- violent premeditated action by a non-state organisation, or violent covert action by a state organisation (other than in a declared war)
- action that is related to the defence or change of a government or political policies of a country or countries, by coercion or intimidation
- action where foreign nationals are directly involved in the attempted change, or are the subject of the resistance to change.

This definition excludes domestic terrorism that harms foreign nationals, and it excludes attacks for which non-political motives appear to be primary or where the reasons are unknown. If applied to the attacks covered in this analysis, then it would reduce the total number of fatal terrorist attacks from 32 to 7 (i.e. in Table 4, only those in rows 2 and 4, and one attack from row 3). However, this alternative definition arises only from our experience in analysing this 10-year data period for a select group of nations, and thus it could benefit from further refinements by both epidemiologists and others.

Another limitation with this analysis is the exclusion of deaths of nationals from the countries specified, in places outside these groupings of countries. For example, there were a total of 150 US citizens (and dual citizens) killed by international terrorist attacks (as recorded by the State Department) in the 10-year period in other parts of the world. There also remains a need for further analysis of international terrorism deaths outside the selected countries.

Not all of the data on the fatal attacks collected by the State Department could be verified from other sources (i.e. in 9% of attacks). Even for the attacks for which some level of verification was possible, various problems remained (e.g. for the 11 September attack the final official death toll was still not finalised [15]). We also note the problems of enumeration in settings with chronic political violence [16].

The use of provincial or city population denominators for calculating rates would have provided higher annual mortality rates from international terrorism in jurisdictions such as New York State and Chechnya. However, as detailed in the methodology section, we considered national rates to be more appropriate for various reasons (e.g. given the relatively small total number of fatal attacks in this analysis ($n = 32$)).

Despite these various limitations, this analysis provides a starting point for considering the epidemiology of international terrorism and for indicating areas in which improvements in data quality are desirable.

The mortality burden from international terrorism

The mortality impact from international terrorism appears to be significant, with the burden being highly

variable between the developed countries. However, the relatively high impact for the United States is almost entirely due to a single attack – which far exceeded in scale all the other attacks combined.

The 3299 deaths across the 39 countries in this analysis, comprised nearly half (49%) of all the State Department recorded international terrorism deaths (for non-perpetrators) in all countries for this 10-year period (3299/6776). However, the *number* of such attacks was only 6% of the total for all countries (32/540) with India alone having 178 attacks (or 33% of the total).

It is not possible to identify an overall trend in the incidence of fatal international terrorist attacks over this 10-year period for developed countries, due to the relatively small numbers of attacks involved. Nevertheless, the fatal bombings in France and the United Kingdom were all restricted to the first 5-year period.

Compared to other homicide in developed countries, international terrorism imposes a relatively small mortality burden (i.e. estimated at 208 times smaller). But there may be qualitative similarities in the mental health impacts on the population from these two forms of violence. This is because some well publicised homicides of famous people, or mass shootings in schools and workplaces, can produce widespread community concern.

Relative to international terrorism, a number of writers have quantified greater mortality from threats to public health from HIV/AIDS [17], other naturally occurring infectious disease threats [18], and from global climate change [19]. For selected developed countries, annual fatalities associated with homicide, suicide, and road crashes collectively have also been reported to greatly exceed the death toll from the 11 September 2001 attack [20]. Mortality from violent

conflict within and between states is also major global public health problem [21, 22]. The tendency of governments to focus on ‘acute’ threats such as terrorism has even been contrasted with the response to the enormous harm attributable to global tobacco use [23]. Nevertheless, it is acknowledged that some of the resources spent on combating international terrorism may have some side benefits in other arenas (e.g. for disease surveillance and crime prevention).

Implications for surveillance and prevention

The definitional and data quality issues identified in this analysis highlight the need for better data collection. An international agency such as the WHO could collect and publish a database of international terrorist attacks.

The classification system used in this analysis for the type of underlying conflict (Table 4), suggests that these developed countries could potentially prevent many terrorist attacks by the improved resolution of internal conflicts (e.g. in Chechnya). To minimise international terrorism associated with conflict in other parts of the world, developed countries could also consider playing stronger roles in conflict resolution, in supporting sustainable structural change to alleviate poverty and global inequalities [24], and in engaging in dialogue to reduce tensions between conflicting ideologies.

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Appendix A

Table A1. Additional fatal international terrorism attacks for 1994–2003 in developed countries that were not included in the US State Department’s data set (but which appear to be very likely to meet the definition used by this organisation)

Date	Country	Details (based on the CPJ website [25] unless otherwise stated)
1994 (28 January)	Bosnia and Herzegovina	Three Italian journalists were killed by mortar fire near Mostar
1994 (May 1)	Bosnia and Herzegovina	The American Brian Brinton and another journalist were killed near Mostar by road mines
1994 (30 August)	Bosnia and Herzegovina	Mohammed Hussein Navab, an Iranian journalist was killed
1995 (10 January)	Russia (Chechnya)	The journalist Jochen Piest was killed in the village of Chervlyonna
1995	Russia (Chechnya)	The American journalist Andrew Shumack has been missing in Chechnya since July 1995
1996	Russia (Chechnya)	Ukrainian journalists have been missing in Chechnya since September 1996 (Vitaly Shevchenko and Andrei Bazvluk)
1998 (18 November)	Canada	A publisher of the Indo-Canadian Times, Tara Singh Hayer, was shot dead. A previous assassination attempt on him was linked to a militant international Sikh organization
2002 (26 September)	Russia	Roddy Scott, a British free-lance cameraman, was killed in Ingushetia

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