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Heatwave of August 2003 in Europe: provisional estimates of the impact on mortality

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This report may be of interest to those involved in the rapid response to communicable disease threats since much of the capacity and resources for rapid response to public health emergencies in Europe and elsewhere are to be found within the field of communicable disease. In response to the heatwave related mortality in France in summer 2003, it is interesting to note that three fellows from the European Programme for Intervention Epidemiology Training (EPIET) and six fellows from the French National training programme in Field Epidemiology (PROFET) were involved in the response to the heatwave in France, particularly in investigations and epidemiological studies carried out in nursing homes (personal communication, Alain Moren, 9 March 2004).

The French experience in 2003 shows that heatwaves in the European Region have not previously been considered a serious risk to human health with ‘epidemic’ features. Basic questions such as whether or not a heatwave can be predicted, detected or prevented, and how respond to it, must be addressed (1).

In August 2003, Europe lay sweltering under a heatwave. Although the hot weather was initially welcome, a more sinister outcome soon became apparent. As France experienced the highest temperatures for 50 years, more than 14 000 people died than would have be expected for that time of year. Paris experienced the highest nighttime temperatures ever recorded on 11 and 12 August (25.5^{o}C), and death rates more than doubled. The heatwave was unusual in that it affected several countries and persisted for at least 10 days; in fact the whole summer (June, July, August) was much hotter than usual (2).

This paper summarises the preliminary findings officially reported from several countries of the effects of this heatwave on total mortality (Table). The estimates compare observed deaths in a defined period with those expected during the same period in previous years. Estimates are sensitive to the method used to calculate the ’expected’ mortality. Further, countries experienced differing exposures in terms of magnitude, duration and levels of weather variables, such as humidity, which makes direct comparison of impacts between countries difficult. Due to inherent delays in the death registration systems, it will be at least a year before the total burden of the heatwave can be formally estimated from complete mortality datasets.

Table. Provisional estimates for mortality attributed to heatwave event, by country.

Country	Heatstroke deaths +	Excess deaths(%**), all ages	Time period	Method for estimating baseline mortality	Reference
England and Wales	§	2045 (16%)	4 to 13 August	Average of deaths for same period in years 1998 to 2002	3
France	§	14802 (60%)	1 to 20 August	Average of deaths for same period in years 2000 to 2002	4,5
Italy	§	3134 (15%)	1 June to 15 August	Deaths in same period in 2002	6
Portugal	7	2099 (26	1 to 31	Deaths in	7, Personal communication from Ministério da Saúde

Portugal	7	%)	August	same period in 1997-2001	(ministry of health), Portugal, 17 November 2003.
Spain	59	Evaluation in progress		-	8

Key:
+ coded under ICD10 X30 or ICD9 E900
§ not reported
** % excess death =[observed-expected]/expected * 100

The preliminary results in the table show that there is a lack of information on the number of reported deaths due to classical heat illnesses. Lessons learned from other countries have shown that most excess deaths are due to other causes such as cardiovascular and respiratory diseases. Data from France indicate that the main burden of excess mortality was in those aged 75 and over, and across a wide range of causes of death. More than 60% of these deaths occurred in hospitals, private healthcare institutions and retirement homes (4). Although the heatwave affected most of western Europe, there were important spatial variations, with some cities in central France reporting more than 100% increases in mortality during the heatwave.

High levels of air pollution (tropospheric ozone) were recorded in Paris, London and other cities, and there is a need to understand better the interactions between air pollutants and temperature exposures. It is also possible that death rates will have fallen after the heatwave because of some short term displacement in mortality of the very ill. More detailed investigations of the impact of the heatwave can be expected from research groups throughout Europe this year.

The summer of 2003 has shown that Europe is vulnerable to the effects of heatwaves on human health. A number of concomitant factors contributed to the high excess mortality in some countries, such as the unexpected length and intensity of the heatwave, a lack of preparedness of healthcare and social systems for such an extreme event and the lack of community-based intervention plans. Local and national governments need to start thinking about whether they should develop heatwave intervention plans. The World Health Organization has recommendations for short term and long term strategies for reducing the health impacts of heatwaves (9).

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