



On the impact of urban landslides

D.N. Petley

International Landslide Centre, Durham University, Durham, United Kingdom,
(d.n.petley@durham.ac.uk / Phone: +44-191 3341909)

In the last two years it has become increasingly apparent that landslides represent a much greater hazard than has been traditionally assumed. Reviews of the economic and social impact of landslides often emphasise the importance of mass movements in urban environments both in terms of economic losses and human fatalities. However, to date there has been no systematic quantitative analysis of the comparative importance of urban and rural landslides, or indeed of the distribution in space of urban landslide events.

In this paper, data from the International Landslide Centre global landslide fatality database are used to examine the impact of urban landslides. In particular, a detailed analysis is made of the spatial occurrence of urban landslides in 2004. Using an analysis of the latitude range of the landslide events, it is shown that the occurrence of urban and rural landslides combined closely matches the distribution of the global population by latitude, which of course reflects the importance of vulnerability in determining the loss of life in landslide events. However, when urban landslides alone are considered it is clear that the occurrence of these events is strongly skewed towards the tropical regions, even though this does not match the distribution of population. Indeed, in the tropical regions the majority of landslide fatalities occur in urban areas, whereas at the higher latitudes the majority of fatalities occur in rural areas. An analysis is undertaken as to why this should be. It is suggested that, contrary to some previous suggestions, this is not the result of the rapid growth of urban cities. Instead, it is proposed that in higher latitude areas the seasonality of rainfall leads to a high occurrence of very energetic debris flow type events that result in many fatalities in rural areas. In the tropical regions, the lower seasonality of rainfall means that such events are less common. However, here the nature of the soil and vegetation means that disturbance of the landscape without adequate preventative measures means that

landslides frequently occur. Inevitably, the development of urban areas leads to a high occurrence of this type of disturbance, with the resultant landslide impacts.