Reviewer's report

Title: Predicting the Burden of Injuries and Fatalities due to Public Exposure to Engineering Technologies - A Public Safety Regulator's Initiative

Version: 1 Date: 23 September 2012

Reviewer: Kavi Bhalla

Reviewer's report:

The primary purpose of this paper is to develop a simulation model for predicting risk of regulated devices (e.g. escalators) using a summary measure of public health, DALYs, as the outcome measure. This is a novel attempt to quantify public health impacts by a government agency and the method is a broadly sensible approach to rational decision making by a safety regulation agency.

As I see it, the paper has two aspects: the Montecarlo simulation, and the computation of DALYs. The latter (DALYs) was my primary focus in reviewing the paper. The former (simulation) seemed like a reasonable approach to me.

Major Compulsory Revisions

- Table 1 (Disability weights related to TSSA specific Injuries [1]) is one of the most important aspects of this analysis because the measured DALYs scale algebraically based on the entries for disability weights. However, the manuscript does not describe the source of these numbers and whether the disability weights are meaningful. The citation "[1]" points to the 2003 Australian Burden of Disease report but when I looked through that report I did not find any listing of disability weights that corresponds to Table 1. I believe that the Australian BOD study used the original GBD disability weights. However, the original disability weights (available from http://www.who.int/healthinfo/global_burden_disease/GBD2004_DisabilityWeights.pdf) do not include such categories as "swelling" and many other entries in Table 1. It is important for this paper to provide an explanation of the source of Table 1 and a discussion of the suitability of the choices in Table 1.

- Some of the high disability weight entries in Table 1 do not seem to be injury related. E.g. Table 1 and Fig 4 list "Heart Attack". I do not understand why these are are counted in the study. Shouldn't this study only be counting health events that are related to the devices being regulated (i.e. elevation devices)? Please clarify in the manuscript. If a "heart attack" was brought on by an injury, then wouldn't the disability weight of the injury already capture the disability associated with such a "heart attack"?

- Figure 4 shows incidence of the various injury sequelae. It is clear that ~90% of the incident cases are very minor injuries. There is a large literature (e.g. Haagsma 2008 in Injury Prevention) surrounding the problems with using GBD methods for high-incidence low-disability conditions. GBD implicitly assumes that low-incidence high-burden conditions contribute most to the population public
health burden. As a consequence, GBD prioritizes measurement of the incidence and disabilities associated with severe injuries, focusing attention on cases that would at least need attention in a medical facility. As a result, GBD parameters (disability weights, durations) for high-incidence low-disability conditions are not likely to be accurately measured. Thus, it is not clear to me if application of GBD parameters (I am assuming that Table 1 is somehow adapted from GBD disability weights) is meaningful for the spectrum of injuries shown in Figure 4. It may be ok … but it is important that the authors discuss this and make the assumptions clear.

Minor Revisions:
The paper makes a few references to "Unobservable states" - I was not sure what this meant -- could the text provide an example?

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests