



BLACKSMITH INDEX – OVERVIEW

The Blacksmith Index (BI) provides a basic numerical value for the risk associated with any site which has been subject to an Initial Site Assessment (ISA). The values provided are relative rather than absolute and are intended to provide input to the process of setting priorities across sites.

The Index, which is operationalised as a simple spreadsheet, is based on the widely used Source-Pathway-Response model of risk assessment. (At Blacksmith, this approach is usually referred to as the Pollution-Pathway-People model.)

The basic algorithm was initially developed with the input and advice of Technical Advisory Board members for the first World's Worst Report in 2006 and has been refined subsequently. It calculates an Index value (an integer from 1 to 10) using standardized basic information collected in the ISA.

The formulation is essentially:

$$BI = f [(Potential\ population\ at\ risk); (Severity\ of\ pollution); (Intensity\ of\ Exposure); (Allowance\ for\ severe\ and\ persistent\ toxins)]$$

The critical aspects of the model are the choice of the underlying functions and the weights given to the different terms. These have been developed by Blacksmith and the TAB through experience and trial.

REFINEMENT

In mid-2010, Blacksmith reviewed the formulation of the model, in the light of the increasing number of sites in the database and the wide range of information that had become available. A calibration exercise was carried out with the involvement of a number of TAB members. A sample of varied projects were evaluated by the TAB, using the standard database information, and these projects were ranked separately using the Index. The Index results were compared with the expert ranking and adjustments were applied until the BI consistently reflected the judgments of the TAB.

FORMULATION

The adjusted formulation is now based on the sum of the log of the population, the log of the severity, and the other two factors. This formulation provides consistent rankings, in terms of risks to human health, across the wide range of sites in the database. Different structures for the Index and the inclusion of various weights allowed for close fit in some cases but did not achieve the same level of consistency across the range of sites tested. The simple adjusted formulation has therefore now been adopted for the Index.

APPLICATION

The Blacksmith Index value is calculated for each site, using standard data fields from the Initial Site Assessment. Each site is reviewed for internal consistency, to ensure that the BI value does reflect the overall character of the site and the scale of the reported impacts. It must be emphasized that the Index provides a relative ranking of sites and is intended to help in setting priorities for more detailed investigation. It is not, of itself, a judgment on the health impacts of any one site.