

ACCIDENT RATIO STUDIES AND THEIR LIMITATIONS

Some years ago, a study of 1,750,000 accidents, in 21 industries, led by Frank Bird, showed that there is a fixed ratio between losses of different severity (and accidents where no loss occurred, i.e. near misses).

This can be demonstrated with a pyramid model:

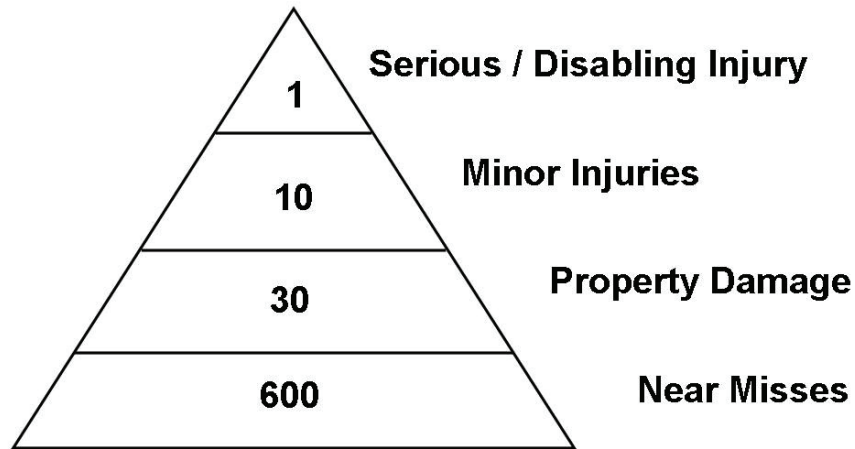


Figure A2-5: Accident Ratio Study.

Source: Frank Bird.

There have been several versions of the accident pyramid, with some in HSE publications, e.g. HSG 96 “The Costs of Accidents at Work”.

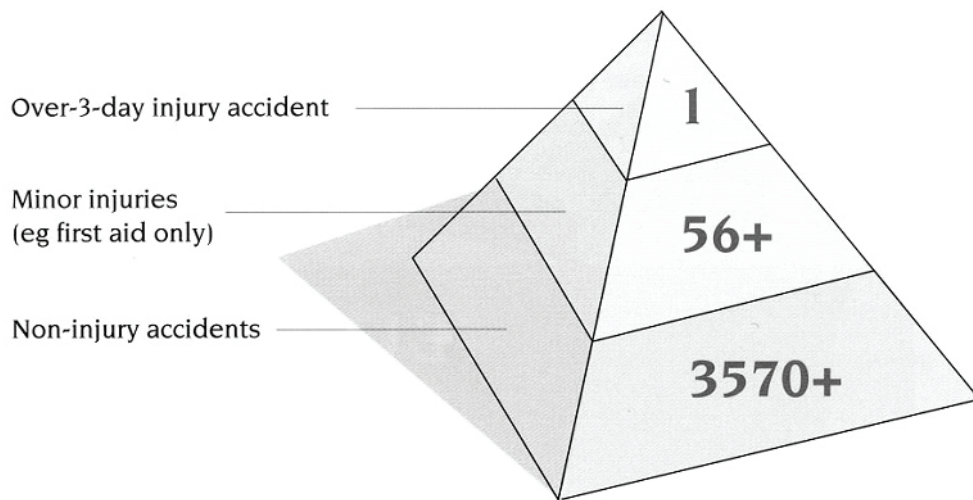


Figure A2-6: Accident Ratio Pyramid.

Source: HSG96 The Costs of Accidents at Work.

These results show that Bird’s findings are not uniform throughout industry and in fact differ from industry to industry. This may be mostly due to the range of risk involved, but there could also be cultural differences, and the level of reporting.

The accident ratio studies may not necessarily show the extent of the loss to the organisation. For example, the “property damage” category may include extensive damage to large plant and equipment. Also, shown from Bird’s and HSE’s examples, there are no universally agreed definitions of each subset of accident type.

Analysis

METHODS OF CALCULATING INJURY RATES FROM RAW DATA

ACCIDENT FREQUENCY RATE

Frequency rate = accidents compared with time =

$$\frac{\text{Number of accidents in the period}}{\text{Total hours worked during the period}} \times 1,000,000$$

This uses the ‘1,000,000’ multiplier that the HSE and International Labour Office (ILO) use. In the UK organisations frequently use multipliers of 100,000 or less, in order to bring the numbers to a manageable size, and the USA use 200,000. Care should be taken that the multiplier is specified when making comparisons.