

# New Perspectives on Risk Management

**By analyzing the ratio of close calls to accidents and fatalities, safety professionals can prove that most accidents are the result of human behavior, rather than pure chance.**

**by Larry Wilson**

Most safety professionals are familiar with risk pyramids or triangles. Although the perspective these risk triangles provided has been valuable, some practitioners still take the numbers too literally.

## Looking Back on Risk Analysis

In 1929, William Heinrick postulated that the relationship between hazards and close calls (near misses and injuries



Figure #1

that require first aid) was a ratio of 10 to 1, and the relationship between close calls and minor injuries (recordables) was also 10 to 1. Furthermore, he said the relationship between minor injuries and major injuries (lost-time) was 10 to 1 as well. Finally, he looked at the relationship between major

injuries and fatalities as being a ratio of 30 to 1. (See Figure 1.)

In the 1960s, Frank Bird looked at it in much the same way, but he put forth different numbers. He said that for every 600 incidents with no visible damage, there would be 30 with damage, 10 minor injuries and one serious injury. (See Figure 2.)

## Today's Analysis

Today, the relationship between recordable worker's compensation cases and lost-time cases is only 2 to 1 and the relationship between lost time and fatalities is approximately 500 or 600 to 1. However, many safety professionals continue to tell both management and their employees that the difference between close calls and fatalities is just pure luck. In some cases, this is true. But a few obvious examples, such as an explosion with no one in the area, do not mean that it is always this simple.

Another interesting fact about risk pyramids and their relationships is that they also apply on an individual basis. (Most people have had more first aid and minor injuries



Figure #2

than serious injuries. This makes sense because “macro” relationships are nothing more than the aggregate sum of all “micro” relationships.

I have asked tens of thousands of people in my career to build their own risk pyramid. The results are certainly much different than 10 to 1. So much different, in fact, that they point to assignable causes as the reason for injuries as opposed to pure luck random chance.

Not surprisingly, of those surveyed, not one had experienced a fatal injury. However, on average, most people between 30 and 50 years of age had experienced between 1 and 5 serious acute injuries.

Moving down a level, they had experienced between 5 and 10

minor injuries (stitches or sprains). But here's where it gets interesting. As far as cuts, bruises and scrapes, they had experienced from 5,000 to 10,000, with almost half occurring before they were 8 years old. When asked about close calls, for example losing your balance but recovering without falling or hitting the brakes quickly to avoid hitting another car, truck or pedestrian, few people could count the number they have had that could have killed them, although most say the number is probably between 10 and 20.

So, on an individual basis, the

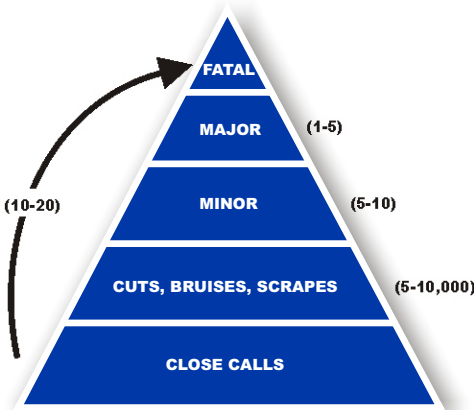


Figure #3

risk triangle is closer to Figure 3. That means that, for most people, the relationship between first-aid or cuts, bruises, and scrapes and medical-aid where a doctor was required is closer to 1000 to 1. This is a far cry from 10 to 1. So, it makes sense to surmise from a 1000 to 1 relationship that perhaps more than luck was involved.

Suppose, for instance, we postulate that the difference between cuts/bruises and stitches/fractures is whether the person got a chance to take advantage of a split second reflex. Without a reflex action, the outcome would usually be much worse or the injury much

more severe. Therefore, it follows that the main reasons why people would not have the advantage of a reflex is that they did not see danger at all or they did not see it in time.

### Being Safe Isn't Pure Luck

By accepting the 1000 to 1 relationship as being a function of "eyes and mind not on task," rather than just pure luck, the numbers start to make sense.

Furthermore, a survey asking people about their serious injuries will find that when they got hurt badly, they made either an eyes not on task, a mind not on task error, or they made both errors at once. These errors also may have caused them to move into or be in the line of fire or to cause them to lose their balance, traction or grip.

It is important to note that eyes not on task and mind not on task are not involved in all acute injuries. Sometimes the equipment or the "other guy" caused the injury. But of the 45,000 people I have asked so far, the equipment doing something unexpectedly or the other guy doing something unexpectedly accounted for less than 10 percent of acute injuries.

So, if you tell people that the difference between serious injuries and close calls is just pure luck, do not be surprised if they do not believe you. In all likelihood, they will not have asked 45,000 people how they got hurt to confirm their suspicions, but intuitively they know it is not that simple. After all, they have experienced thousands of injuries themselves and only a few of those were serious.

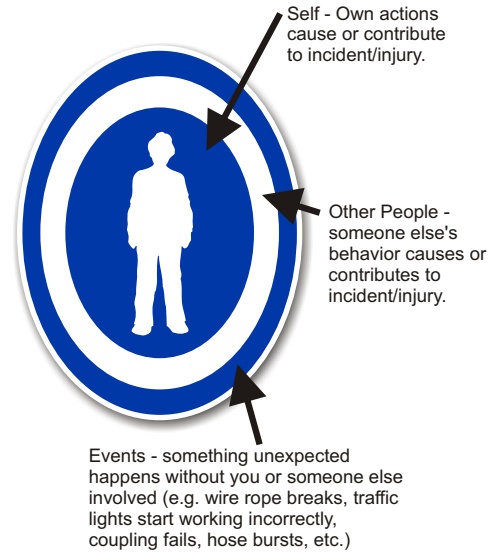


Figure #4

**About the author:** Larry Wilson has been a behavior based safety consultant for 20 years. He has worked with over 1,000 companies in Canada, the United States, Mexico and Europe. He is also the author *SafeStart*, an advanced safety awareness program currently being used by over 1,000,000 worldwide. You can reach him at [larry@electrolab.ca](mailto:larry@electrolab.ca).

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