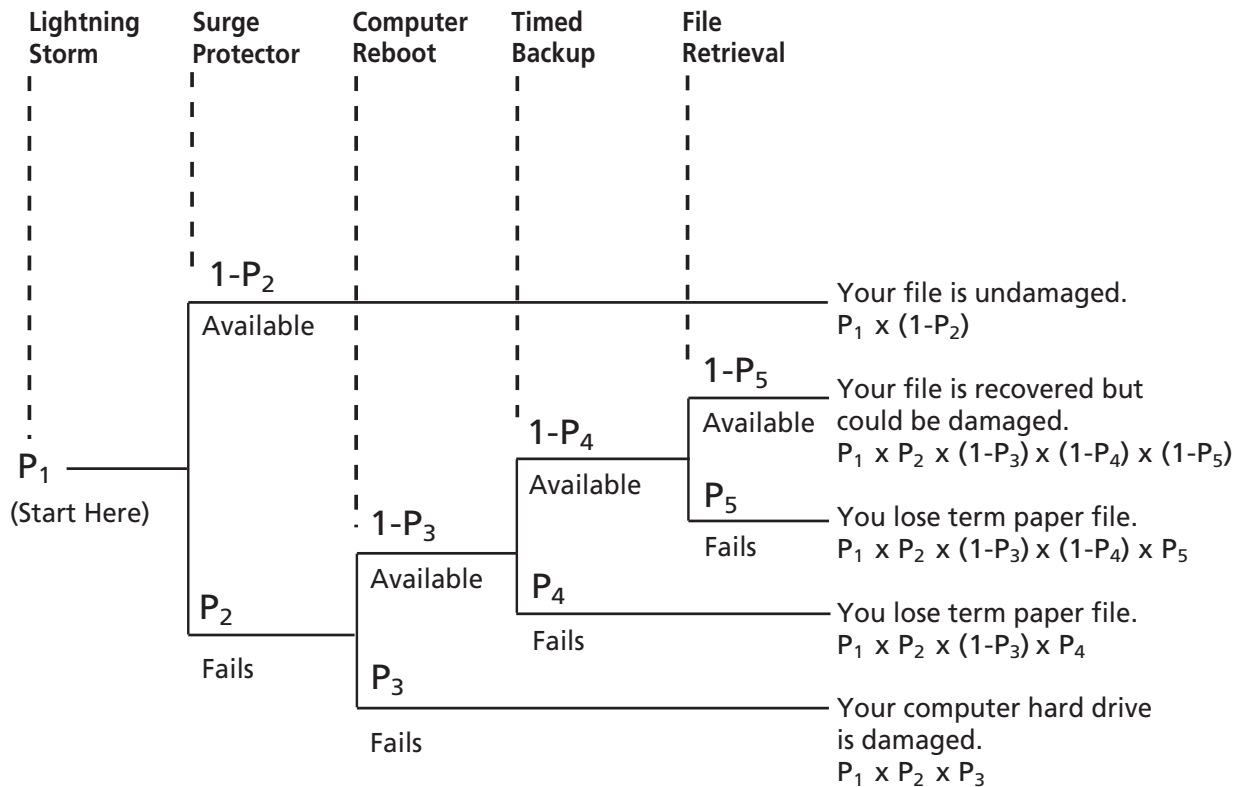


## Examples of Risk Assessment Tools

### 1) SIMPLIFIED EVENT TREE FOR LOSS OF A TERM PAPER COMPUTER FILE DURING A LIGHTNING STORM



P<sub>1</sub>  
 P<sub>2</sub>  
 P<sub>3</sub> = probability that the function fails  
 P<sub>4</sub>  
 P<sub>5</sub>

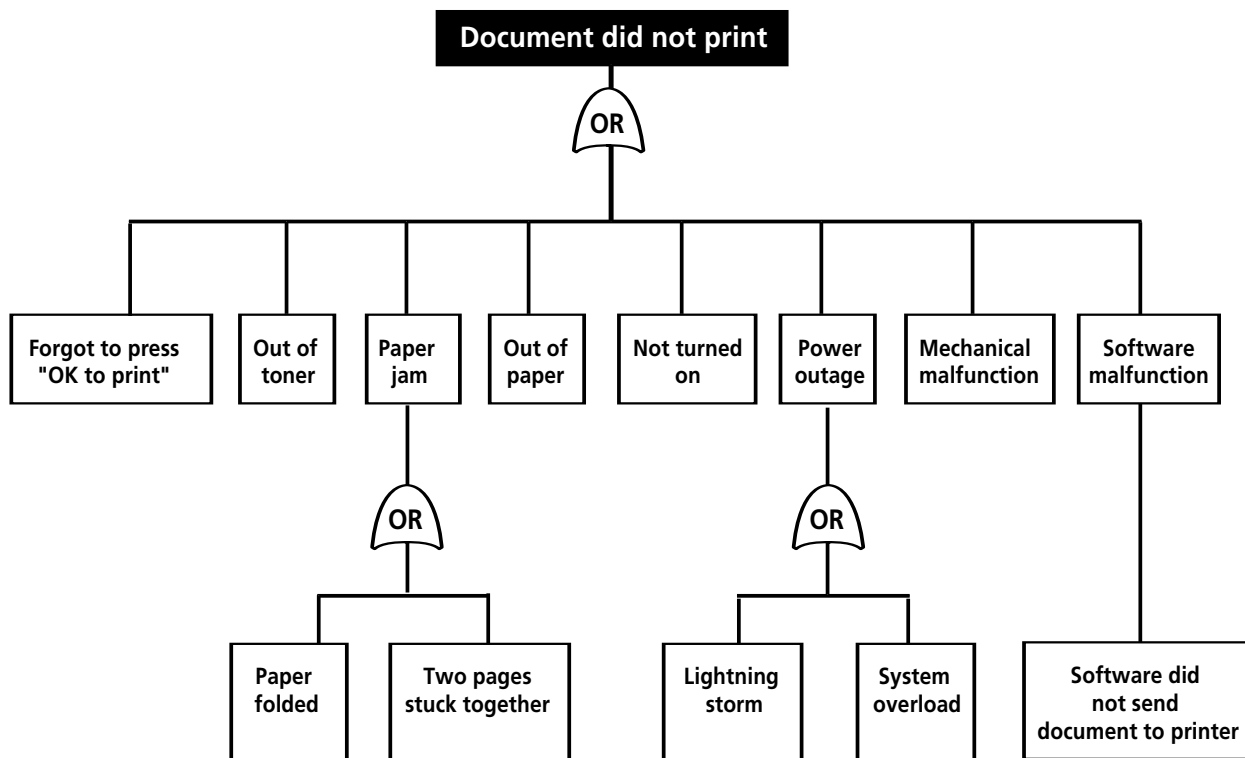
1-P<sub>1</sub>  
 1-P<sub>2</sub>  
 1-P<sub>3</sub> = probability that the function is available and works  
 1-P<sub>4</sub>  
 1-P<sub>5</sub>

*continues on next page*

## Examples of Risk Assessment Tools

*continued*

### 2) SIMPLIFIED FAULT TREE FOR A COMPUTER-GENERATED DOCUMENT THAT HAS FAILED TO PRINT

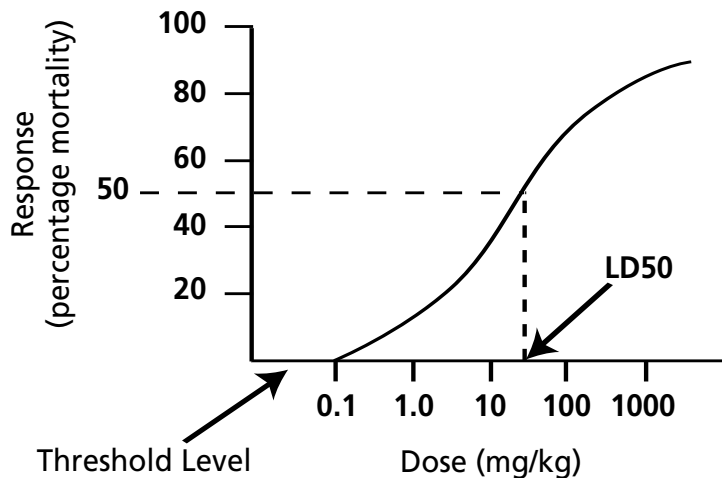


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## Examples of Risk Assessment Tools

*continued*

### 3) DOSE/RESPONSE CURVE FOR ACUTE TOXICITY OF A CHEMICAL ADMINISTERED ORALLY TO RATS (SINGLE DOSE)



**LD50** = single dose expected to be lethal to 50 percent of the test animals (80 mg/kg)

**mg/kg** = milligrams of chemical (solid or liquid) per kilogram of body weight of the test animal

**Threshold level** = dose below which the probability of a response is zero (0.1 mg/kg)

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## Examples of Risk Assessment Tools

*continued*

### 4) EPIDEMIOLOGICAL DATA (EXPRESSED AS THE RATE OF ILLNESS OR INJURY IN THE OBSERVED POPULATION)

- Ratios**—A ratio is a comparison of two numbers with the same units. For example, the ratio of people in school with colds to people in school without colds is 40:200 (units = people). A ratio can be written as a fraction (40/200), a decimal (0.2), with a colon (40:200), or with words (forty to two hundred).
- Proportions**—A proportion is an equation stating that two or more ratios are equal. For example, 40/200 is proportional to 1/5.
- Rates**—A rate is a comparison of two quantities with dissimilar units. For example, 55 miles per hour compares distance with time. Two basic types of rates used to characterize epidemiological data are incidence rates and prevalence rates.

- Incidence rate** =  $\frac{\text{number of new cases}}{\text{population at risk}}$  (calculated over a period of time)

For example,

$$\frac{\text{the number of new cases of lead poisoning (20)}}{\text{the number of people exposed to water transported in lead pipes (100,000)}} \text{ (over 5 yrs.)}$$

The rate of lead poisoning per 1,000 people over a 5-year period was 0.2 (or 0.02 percent of the exposed population was affected).

Incidence rates may be used to calculate the **relative risk** of illness or injury. This measure compares the incidence rate for those exposed to a risk to the incidence rate for those not exposed. It is important for determining whether there is an association between exposure and effect (illness or injury).

- Prevalence rate** =  $\frac{\text{number of existing cases}}{\text{total population}}$  (at a point in time)

For example,

$$\frac{\text{the number of existing cases of lead poisoning (15)}}{\text{the total population of residents in Smithtown, USA (250,000)}} \text{ on 1/1/98}$$

Some of the sources of epidemiological data include census data; vital statistics (births, deaths, marriages, divorces); health records; and autopsy reports.