



# Conditional Event Probability

## 1 Why

## 2 Definition

Consider two events, the second of which has non-zero probability. The *conditional probability* of the first event *conditioned* on a second event is the result of dividing the probability of the second event into the probability of the intersection of the two events.

### 2.1 Notation

Let  $\mathbf{P}$  be the event probability function. Let  $A$  and  $B$  be two events with  $\mathbf{P}(B) \neq 0$ . Then the conditional probability of  $A$  conditioned on  $B$  is

$$\frac{\mathbf{P}(A \cap B)}{\mathbf{P}(B)}.$$

We denote this by  $\mathbf{P}(A \mid B)$ .