

SOC 4015/5050: Lecture 05 Functions

Christopher Prener, Ph.D.

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Packages

- `ggplot2`
- `moments`
- `nortest`
- `stats`

Binomial Distribution

For the binomial distribution, let:

n = number of independent trials

k = number of successes

p = probability of success in each trial

Probability of k Successes

```
stats::dbinom(k, size=n, prob=p)
```

Probability of k or Fewer Successes

```
stats::pbinom(k, size=n, prob=p, lower.tail=TRUE)
```

Probability of More Than k Successes

```
stats::pbinom(k, size=n, prob=p, lower.tail=FALSE)
```

Poisson Distribution

For the Poisson distribution, let:

$m = \lambda$

k = number of successes

Probability of k Successes

```
stats::dpois(k, lambda=m)
```

Probability of k or Fewer Successes

```
stats::ppois(k, lambda=m, lower.tail=TRUE)
```

Probability of More Than k Successes

```
stats::ppois(k, lambda=m, lower.tail=FALSE)
```

Normal Distribution

For the normal distribution, let:

z = standardized score

Cumulative Probability

```
stats::pnorm(z, mean=0, sd=1, lower.tail=TRUE)
```

*Normality Testing**Descriptive Statistics*

```
moments::skewness(data$var)
```

```
moments::kurtosis(data$var)
```

Q-Q Plot

```
ggplot2::ggplot(data, mapping = aes(sample = y)) +  
  stat_qq() +  
  stat_qq_line()
```

Shapiro-Francia Test

```
nortest::sf.test(data$var)
```