

# Nonexhaustive List of Statistics Notation

Ozlem Tuncel

Department of Political Science, Georgia State University  
[otuncelgurlek1@gsu.edu](mailto:otuncelgurlek1@gsu.edu)

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# 1 Greek Letters vs. Roman Letters

Like capital letters, Greek letters refer to population and its attributes. When referring to sample and its attributes, however, we usually use Roman letters. For example,

- $\mu$  refers to a population mean; and  $x$ , to a sample mean.
- $\sigma$  refers to the standard deviation of a population; and  $s$ , to the standard deviation of a sample.

# 2 Use of Capitalization

In general, we use capital letters to refer to population attributes (i.e., parameters); and lower-case letters refer to sample attributes (i.e., statistics). For example,

- $P$  refers to a population proportion; and  $p$ , to a sample proportion.
- $X$  refers to a set of population elements; and  $x$ , to a set of sample elements.
- $N$  refers to population size; and  $n$ , to sample size.

# 3 Population Parameters

- $\mu$  refers to a population mean.
- $\sigma$  refers to the standard deviation of a population.
- $\sigma^2$  refers to the variance of a population.
- $\rho$  is the population correlation coefficient, based on all of the elements from a population.
- $N$  is the number of elements in a population.

# 4 Sample Statistics

- $\bar{x}$  refers to a sample mean.
- $s$  refers to the standard deviation of a sample.
- $s^2$  refers to the variance of a sample.
- $n$  is the number of elements in a sample.

## 5 Simple Linear Regression

- $\beta_0$  is the intercept constant in a population regression line.
- $b_0$  is the intercept constant in a sample regression line.

## 6 Probability

- $P(A)$  refers to the probability that event  $A$  will occur.
- $P(A|B)$  refers to the conditional probability that event  $A$  occurs, given that event  $B$  has occurred.
- $P(A')$  refers to the probability of the complement of event  $A$ .
- $P(A \cap B)$  refers to the probability of the intersection of events  $A$  and  $B$ .
- $P(A \cup B)$  refers to the probability of the union of events  $A$  and  $B$ .
- $E(X)$  refers to the expected value of random variable  $X$ .

## 7 Set Theory

- $A \cap B$  refers to the intersection of events  $A$  and  $B$ .
- $A \cup B$  refers to the union of events  $A$  and  $B$ .
- $\{A, B, C\}$  refers to the set of elements consisting of  $A$ ,  $B$ , and  $C$ .
- $\{\emptyset\}$  refers to the null set.

## 8 Hypothesis Testing

- $H_0$  refers to a null hypothesis.
- $H_1$  or  $H_a$  refers to an alternative hypothesis.
- $\alpha$  refers to the significance level.
- $\beta$  refers to the probability of committing a Type II error.