

# What is a Relative Frequency Distribution?

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A relative frequency distribution is a statistical tool used to display the proportion or percentage of a specific data value in relation to the total number of data values. It provides a visual representation of the frequency of occurrence of each value in a dataset, allowing for a better understanding of the distribution of the data. This type of distribution is commonly used in data analysis and research to gain insights into the patterns and trends within a dataset. It is calculated by dividing the frequency of a particular value by the total number of values, resulting in a decimal or percentage that represents the relative frequency of that value. Overall, a relative frequency distribution is a useful tool for summarizing and interpreting data in a meaningful way.

## What is a Relative Frequency Distribution?

**A frequency distribution describes how often different values occur in a dataset.**

**For example, suppose we gather a of 400 households in a city and record the number of pets in each household. The following table shows the results:**

Number of Pets	Frequency
1	150
2	90
3	110
4	30
5	20

**This table represents a frequency distribution.**

**A related distribution is known as a relative frequency distribution, which shows the relative frequency of each**

value in a dataset as a percentage of all frequencies.

For example, in the previous table we saw that there were 400 total households. To find the relative frequency of each value in the distribution, we simply divide each individual frequency by 400:

Number of Pets	Frequency	Relative Frequency
1	150	37.5%
2	90	22.5%
3	110	27.5%
4	30	7.5%
5	20	5.0%

←  $150/400 = 37.5\%$   
←  $90/400 = 22.5\%$   
←  $110/400 = 27.5\%$   
←  $30/400 = 7.5\%$   
←  $20/400 = 5.0\%$

Note that relative frequency distributions have the following properties:

Each individual relative frequency is between 0% and 100%. The sum of all individual relative frequencies adds up to 100%.

If these conditions are not met, then the relative frequency distribution is not valid.

Why Relative Frequency Distributions Are Useful

**Relative frequency distributions are useful because they allow us to understand how common a value is in a dataset relative to all other values.**

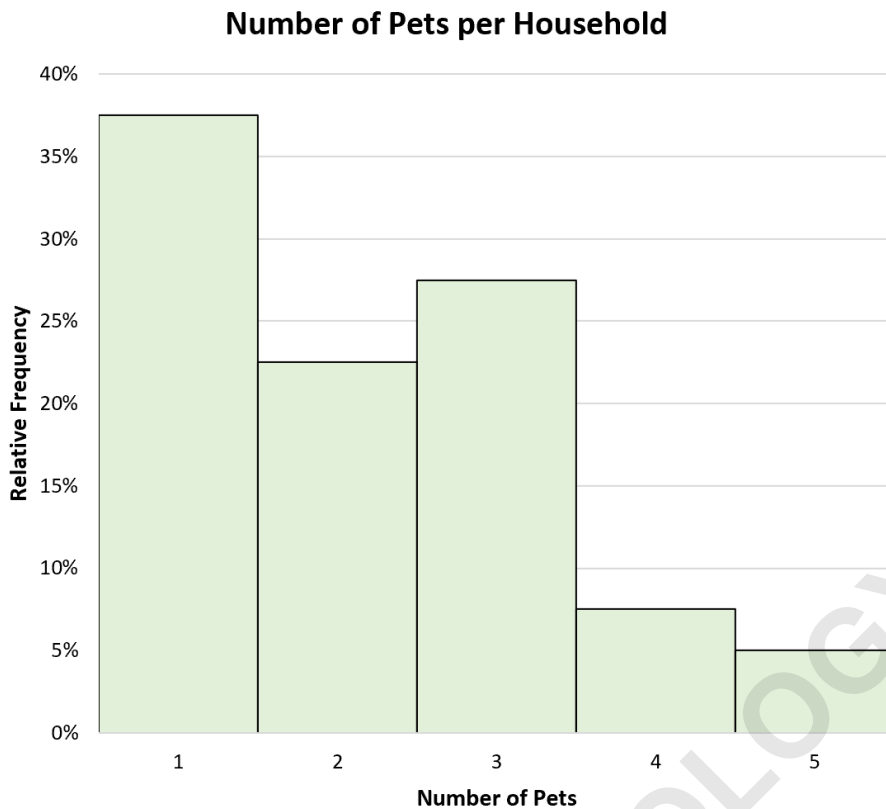
**In the previous example we saw that 150 households had just one pet. But this number by itself isn't particularly useful.**

**Instead, knowing that 37.5% of all households in the sample had just one pet is more useful to know. This helps us understand that a little more than 1 in 3 households had just one pet, which gives us some perspective on how "common" it is to own just one pet.**

#### **Visualizing a Relative Frequency Distribution**

**The most common way to visualize a relative frequency distribution is to create a histogram, which displays the individual data values along the x-axis of a graph and uses bars to represent the relative frequencies of each class along the y-axis.**

**For example, here's what a relative frequency histogram would look like for the data in our previous example:**



The x-axis displays the number of pets in the household and the y-axis displays the relative frequency of households that have that number of pets.

This histogram is a useful way for us to visualize the distribution of relative frequencies.