

Is It in Proportion?

Eric Appleton

When we read, write, and talk about statistics (the study of numbers in the world), the idea of *proportion* is often an important part of the conversation.

Based on the information we have, a proportion tells us what size or share we might expect in a different situation. For example, if oranges cost \$1.50 for one pound, we would expect two pounds of oranges to cost \$3.00. Paying \$3.00 dollars for two pounds of oranges is *proportionate* to paying \$1.50 for one pound of oranges. If we had to pay \$4.00 for 2 pounds of oranges, that would be *disproportionate*; we would think it was unfair.

Here’s another example. Let’s say Ndeye works 10 hours and earns \$150. Her co-worker, Moise, has the same job. He works 15 hours and earns \$300. Is the pay Ndeye and Moise received *in proportion*? You could also ask, “Is this fair?” What do you think?

Let’s practice thinking about proportions and populations of people. In 2020, the U.S. Census counted all people living in the United States. The population data in the Census is often used in proportions.

Approximately what proportion of people in the U.S. do you think identify as “white alone”?

- A. 20%
- B. 40%
- C. 50%
- D. 60%

Approximately what proportion of people in the U.S. do you think are Black?

- A. 15%
- B. 25%
- C. 35%
- D. 45%

Approximately what proportion of people in the U.S. do you think are female?

- A. 49%
- B. 50%
- C. 51%
- D. 52%

Answers: Of total U.S. population, people who identify as white alone: 61.6%. People who identify as Black (alone or in combination): 14.2%. People who identify as female: 50.8%.

Source: <https://www.census.gov/library/visualizations/interactive/race-and-ethnicity-in-the-united-state-2010-and-2020-census.html>

Learn More about Proportion

Proportion (noun): The size of something compared to something else

Example: A **large proportion** of essential workers are employed in health care.

When you look at the word *proportion*, you might notice that it includes the word “portion.” A *portion* is part or a share of a whole.

Example: *At the end of the shift, each worker took her **portion** of tips.*

Related words: *share, percentage, ratio*

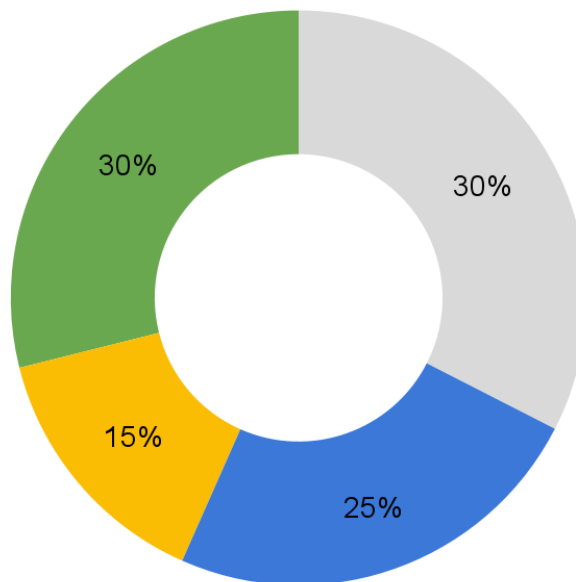
| The size, share, or cost we expect | Larger or smaller size, share, or cost than we expect |
|------------------------------------|---|
| proportionate | disproportionate |
| in proportion | out of proportion |
| representative | overrepresented or underrepresented |

Race and Ethnicity of Frontline Workers in New York City

Let's compare different populations of people. About 8 million people live in New York City. On the right, you can see the approximate percentages of New York City's population by race and ethnicity. Now look at the chart below. What do you notice? In her piece, Adriana Herrera López writes, "In New York City where I live, people of color do more than their fair share of the essential work. They are disproportionately represented." Based on the data from the charts on this page, do you agree or disagree with Adriana? Can you use the data to prove your point? Write several true sentences based on the information in these charts.

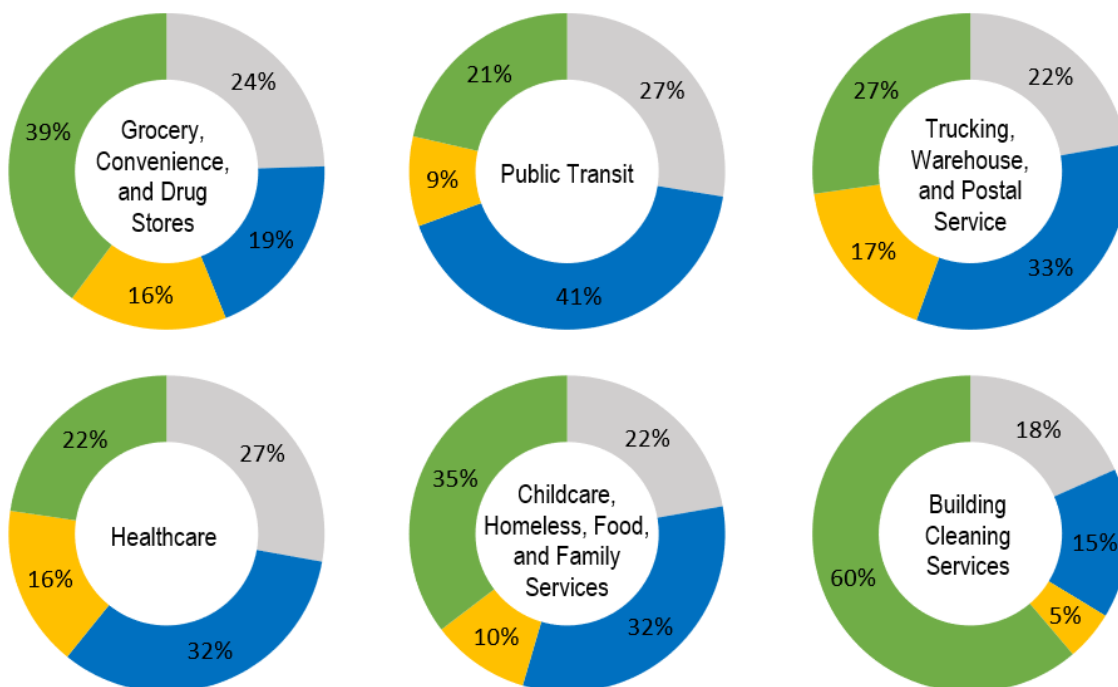
New York City Population by Race and Ethnicity (Approximate Percentages)

White Black Asian Hispanic



New York City Frontline Workers by Race and Ethnicity

White Black Asian Hispanic



Female Frontline Workers in New York City

According to 2019 Census estimates, 52.3% of the population of New York City is female. Based on this information and the chart on the right, write three true sentences about women as frontline workers in New York City. Use terms like *under-represented* and *overrepresented*. Now look at the bar graph below. What do you notice when you compare the table of data with the bar graph showing the same data? The bar graph gives a visual representation of the data. How is that helpful (or not)? Why is it important to look at *both* percent differences *and* differences in hard numbers?

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New York City Frontline Workers, by Sex

| Industry | Women | Men | % Women |
|---|---------|---------|---------|
| Trucking, Warehouse, and Postal Service | 10,381 | 37,638 | 22% |
| Public Transit | 18,788 | 60,037 | 24% |
| Grocery, Convenience, and Drug Stores | 60,732 | 83,968 | 42% |
| Building Cleaning Services | 27,375 | 24,448 | 53% |
| Healthcare | 403,546 | 140,912 | 74% |
| Childcare, Food, & Family Services | 138,360 | 32,594 | 81% |
| Total | 659,182 | 379,597 | 63% |

Sources: United States Census Bureau. American Community Survey 2014-2018 5-Year Estimates; <https://comptroller.nyc.gov/reports/new-york-citys-frontline-workers/>

