



# Understanding Health Equity through Data Disaggregation

## Background

Health equity is the state in which everyone has a fair opportunity to attain their full health potential, and no one is disadvantaged from achieving this potential because of social position or any other socially defined circumstance.<sup>1</sup> Health disparities are differences in incidence, prevalence, mortality, burden of disease and other adverse health conditions that exist among specific population groups.<sup>1</sup> In other words, some Americans face a disproportionate burden of disease or receive lower quality or experience of care which has been linked to worse health outcomes. The causes of health disparities should not be assumed, yet often stem from preventable or unjust systematic differences that effect people and communities occupying unequal positions in society.

Historically, healthcare organizations have examined aggregated patient outcomes data to determine the quality of care they provide. As we learned from the COVID-19 pandemic, aggregated data does not tell the whole story. Disaggregated COVID-19 data revealed stark disparities in outcomes for minority patient populations. Prior to the pandemic, some healthcare organization had begun to disaggregate outcomes data by patient demographics. For example, Rush University Medical Center published an [Equity Report](#) in 2018 with the results of its data disaggregation effort. Organizations that disaggregate data are not only able to improve care for patient populations experiencing the worst outcomes, but they are also winning awards for doing so. Novant Health has [received many accolades](#) for its health equity work, including the inaugural Health Equity Award from the Centers for Medicare and Medicaid Services Office of Minority Health among other recognitions.

Many healthcare organizations have not disaggregated data using patient demographics. Disaggregated data tells more of the story regarding the quality of care provided to all patient populations. The results provide a starting point for targeted quality improvement interventions focused on patients experiencing the worst outcomes. Once tested and proven to be successful, these interventions can be scaled and spread to improve outcomes for all patient populations. This process aligns with a theory called [Targeted Universalism](#), which is an approach that aims for a universal goal while also addressing disparities experienced by certain groups. All healthcare organizations can benefit from examining disaggregated data including incidence, prevalence, mortality, burden of disease and other adverse health conditions by patient population groups.

1. Weinstein JN, Geller A, Negussie Y et al. Key terms. In: Communities in Action: Pathways to Health Equity. National Academies Press; 2017:10.17226/24624

## What is data disaggregation?

Data disaggregation is a multi-step process that includes not only examining the numeric differences in outcomes by patient population, but also the differences in the proportion of the outcomes experienced by each population. The purpose of data disaggregation is to identify potential disparities or differences in incidence, prevalence, mortality, burden of disease or other health conditions of and between groups of patients.

## What are health disparities?

As noted in the background section, health disparities are measurable differences in incidence, prevalence, mortality, burden of disease, and other adverse health conditions that exist among specific population groups in the United States. The most significant health disparities are experienced by racial and ethnic groups; however, health disparities are found across gender, sexual orientation, age, disability status, socioeconomic status, and geographic location. These disparities, or differences in outcomes, have existed for decades, effect minority populations more than others, and often are statistically significant. The Center for American Progress recently published a [fact sheet](#) with some of the most persistent health disparities facing racial and ethnic minorities. For example, they note that African Americans have the highest mortality rate for all cancers combined when compared with any other racial and ethnic group.

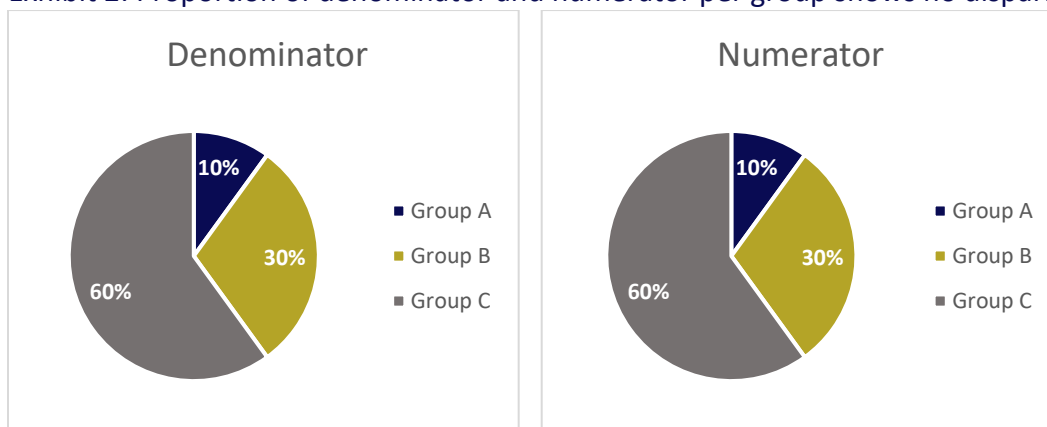
## How does data disaggregation reveal health disparities?

In a perfect world, patient groups would experience outcomes proportional to other patient groups thus eliminating disparities. Exhibits 1 and 2 illustrate what we might see if health disparities did not exist. For example, Group C experiences the same outcomes (e.g., rates or cases) as Groups A and B despite being a much larger group.

Exhibit 1: No difference in rates between patient groups

Patients	Denominator	Numerator	Rate
Group A	50	5	10.0%
Group B	150	15	10.0%
Group C	300	30	10.0%
Total Patients	500	50	10.0%

Exhibit 2: Proportion of denominator and numerator per group shows no disparities



In reality, health disparities exist and data disaggregation is necessary because aggregate data does not tell the whole story. For example, the aggregate rate of 15.4% shown in Exhibit 3 gives an overall sense of the quality of care provided to the total patient population.

Exhibit 3: Aggregate rate

Patients	Denominator	Numerator	Rate
<b>Total Patients</b>	500	77	15.4%

However, as shown in Exhibit 4, when the data is disaggregated you see more of the story. Groups A and B have higher/worse rates than the aggregate rate (18.0%, 18.7% respectively compared to 15.4%). When you subtract the difference, you see that Group A has a 2.6% and Group B has a 3.3% higher/worse rate than the aggregate rate. Group C's rate is lower/better than the aggregate rate.

Exhibit 4: Differences in rates by patient groups

Patients	Denominator	Numerator	Rate	Difference compared to aggregate rate
<b>Group A</b>	50	9	18.0%	2.6% (higher/worse)
<b>Group B</b>	150	28	18.7%	3.3% (higher/worse)
<b>Group C</b>	300	40	13.3%	-2.1% (lower/better)
<b>Total Patients</b>	500	77	15.4%	—

Additionally, we can examine the difference in outcomes *between* patient groups. Exhibit 5 shows the difference when comparing those with higher/worse rates to the group with the lowest/better rate.

Exhibit 5: Differences in rates *between* patient groups

Patients	Denominator	Numerator	Rate	Difference compared to lowest/best rate
<b>Group A</b>	50	9	18.0%	4.7% (higher/worse)
<b>Group B</b>	150	28	18.7%	5.4% (higher/worse)
<b>Group C</b>	300	40	13.3%	—

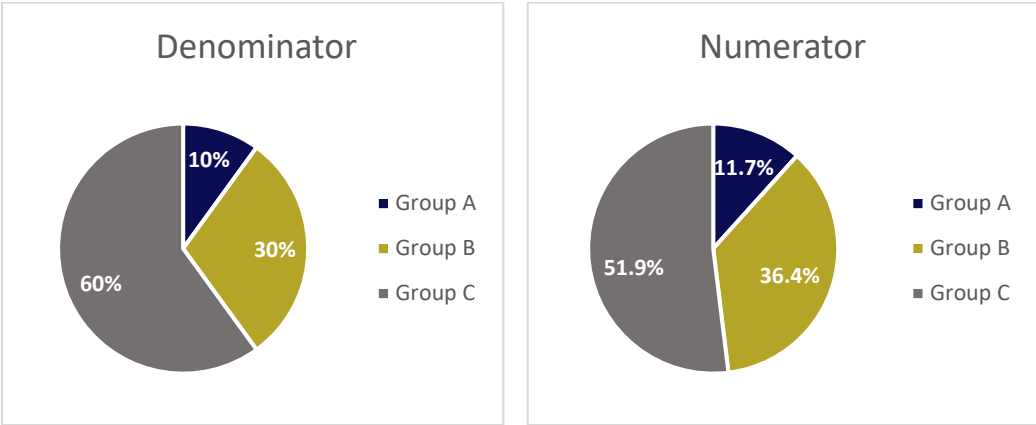
Group A’s rate is 4.7% higher than Group C and Group B’s rate is 5.4% higher than Group C. Disaggregating data in this way reveals numerical differences in outcomes (e.g., rates or cases) for and between groups of patients, but it does not show the proportional burden for each patient group. An additional step is needed to determine which patient group may be experiencing a disproportionate rate when compared with other groups.

Exhibits 6 and 7 further examine the proportion of the denominator and numerator for each group. When you divide each group’s denominator and numerator by the total number of patients, you can see the proportion each group makes up.

Exhibit 6: Proportion of denominator and numerator per group

Patients	Denominator	Numerator	% Denominator	% Numerator	Difference
Group A	50	9	10.0%	11.7%	1.7%
Group B	150	28	30.0%	36.4%	6.4%
Group C	300	40	60.0%	51.9%	-8.1%
<b>Total Patients</b>	500	77	100.0%	100.0%	—

Exhibit 7: Proportion of denominator and numerator per group shows disparities



In this example, Group B makes up only 30% of the total population in the denominator (those who could potentially experience the outcome) but are 36.4% of the population in the numerator (those actually experiencing the outcome) resulting in a disparity of 6.4%. Group A also has a disproportionate share of the outcomes in this example (10% in the denominator and 11.7% in the numerator resulting in a disparity of 1.7%). Group C experiences less of a burden than the other patient groups (60% in the denominator but only 51.9% in the numerator).

This step in the data disaggregation process shows the proportional difference rather than the numeric difference in rates. Analyzing the data in this way shows an even greater disparity for Group B than the difference in rates shown in Exhibit 6 (6.4%) as compared to Exhibit 5 (5.4%). In other words, there is a higher burden for Group B than the other patient populations. Said another way, Group B is experiencing a health disparity.

## Getting started

Data disaggregation does not have to be complicated. Start by selecting one outcome measure such as 30-day readmissions, sepsis, or heart failure and one patient demographic data point such as race, ethnicity, language spoken, gender, age, or payer. Once you identify the outcome measure and the patient groups you wish to disaggregate the data by (e.g., languages spoken including English, Spanish, Somali, etc.), you can create tables and pie charts like the ones shown here to calculate the rates for each group as well as the proportion of the numerator and denominator.

Consider analyzing the statistical significance of your findings—[online calculators](#) make this easy to do. Disparities identified that are statistically significant are ripe for further examination including root cause analysis. It is imperative no assumptions are made as to the cause of the disparity. Qualitative as well as further quantitative analysis must be conducted, including chart reviews, patient and staff interviews, observations (e.g., Gemba walks) and review of standard practices and protocols to uncover what might be causing the disparity.

Any disparities identified, even those without statistical significance, should be tracked and monitored by data analysts, quality professionals and administrative leaders. Data dashboards such as quality, operational or leadership key performance indicator reports can all include disaggregated data elements to better understand the true performance of the organization.

Embedding the practice of disaggregating data into existing data analytics will create a systematic process to identify health disparities. Once identified, targeted interventions can be developed for patient groups experiencing the worst outcomes. Interventions proven to help the specific group of patients identified can be scaled to benefit all patients. This systematic process not only helps healthcare organizations improve outcomes for specific patient populations, but also helps them improve their overall performance and meet their universal aims or goals—a.k.a. [Targeted Universalism](#).

Once a mastery of data disaggregation is reached with one patient demographic data point, try disaggregating measures by multiple, intersecting data points such as race and payer or age and gender. There is an infinite number of measures that can be disaggregated (e.g., process, outcomes, experience). Select measures that align with the goals of the organization to ensure support for data disaggregation efforts and the subsequent quality or performance improvement work needed to resolve any disparities identified.

## About the Author

Kellie Goodson, MS, CPXP is a thought leader in the areas of health equity and patient and family engagement (PFE), specifically their use in health care quality and safety improvement. She has worked with multiple health systems to incorporate health disparities identification and resolution and PFE strategies into their quality improvement efforts. Connect with Kellie on [LinkedIn](#).