Quality Improvement Basics
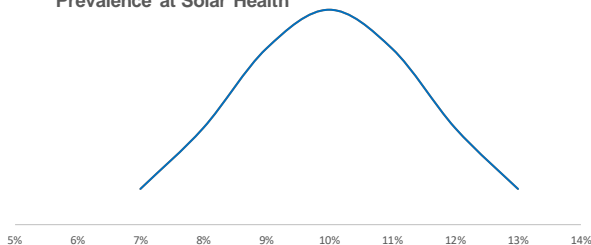## Data Analysis Example

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Describing Data: Summary Stats

Distribution of Monthly Cancer Prevalence at Solar Health
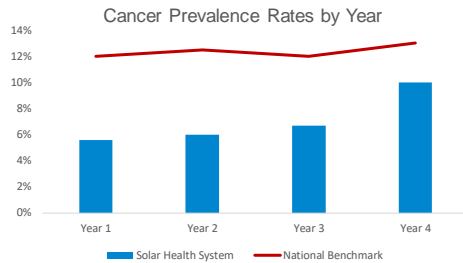
5% 6% 7% 8% 9% 10% 11% 12% 13% 14%

- **Mean**: 10% was the average cancer prevalence rate
- **Median***: 9% was the middle value for cancer prevalence rate
- **Mode**: 9% was the most frequently reported cancer prevalence rate
- **Range**: [7%,13%] - Rates ranged from the lowest at 7% up to the highest at 13%

*The median will usually approximate the mean unless you have significant outliers or an abnormal distribution.

Solar Health System – Current Year	
Month	**Cancer Prevalence Rate**
Jan	10%
Feb	11%
Mar	8%
Apr	12%
May	9%
June	9%
July	8%
Aug	9%
Sep	11%
Oct	13%
Nov	7%
Dec	9%

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Diagnostic Analysis: Identifying Trends and Anomalies
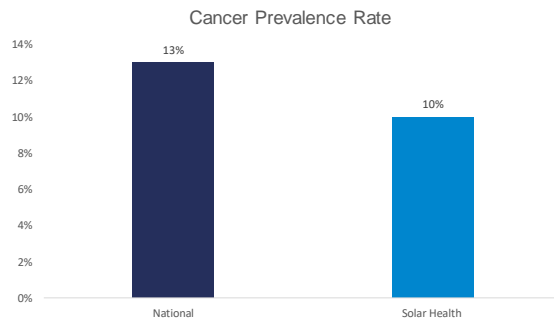
Cancer Prevalence Rates by Year

- Trends and Comparisons
  - Cancer prevalence is increasing over time for both national rates and Solar Health rates
  - Prevalence at Solar Health is consistently lower than the national rate
- Anomalies
  - Cancer rates at Solar Health in Year 4 increased substantially from the previous years

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Diagnostic Analysis: Stratification

Cancer Prevalence Rate

10% of Solar Health's 70,000 patients across two hospitals and three clinics have been diagnosed with breast cancer. This is a little bit lower than the national average and is within a standard range, so it doesn't cause much alarm to leadership or community members. However…
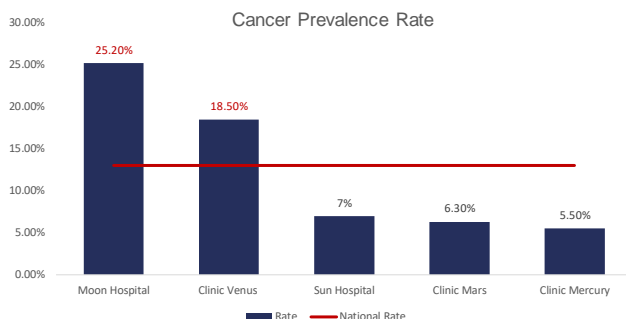
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Diagnostic Analysis: Stratification
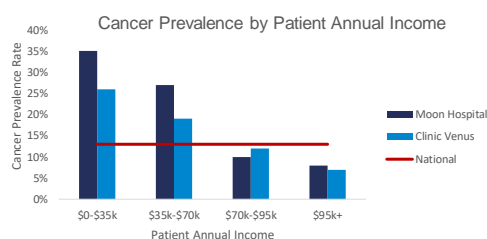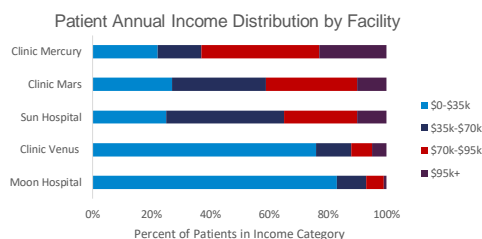
Cancer Prevalence Rate

- Stratifying by facility, we can see that Moon Hospital and Clinic Venus have much higher rates of cancer prevalence that were masked by the other facilities' lower rates.
- What interactions could be happening that could cause these stark differences in rates?

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Diagnostic Analysis: Identify Relationships

Patient Annual Income Distribution by Facility

Cancer Prevalence by Patient Annual Income

- When we stratify by the distribution of patient income at each facility, we can see that Clinic Venus and Moon Hospital have a much larger low-income patient population than the other sites.
- By stratifying even further at just Moon Hospital and Clinic Venus, we can see that cancer rates are much higher for low-income patients than the rates for patients with an annual income over $70k.
- There seems to be a correlated relationship between patient income and cancer prevalence rates.

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Summary

- Summary statistics help us understand the dataset's characteristics, size, and variables. The mean, median, mode, and range give a high-level overview of the data.
- Plot data over time to spot trends, patterns, and anomalies.
- Purposeful stratification compares outcomes across strata to uncover disparities or trends.

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Stratis Health is a nonprofit organization that leads collaboration and innovation in health care quality and safety and serves as a trusted expert in facilitating improvement for people and communities.

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