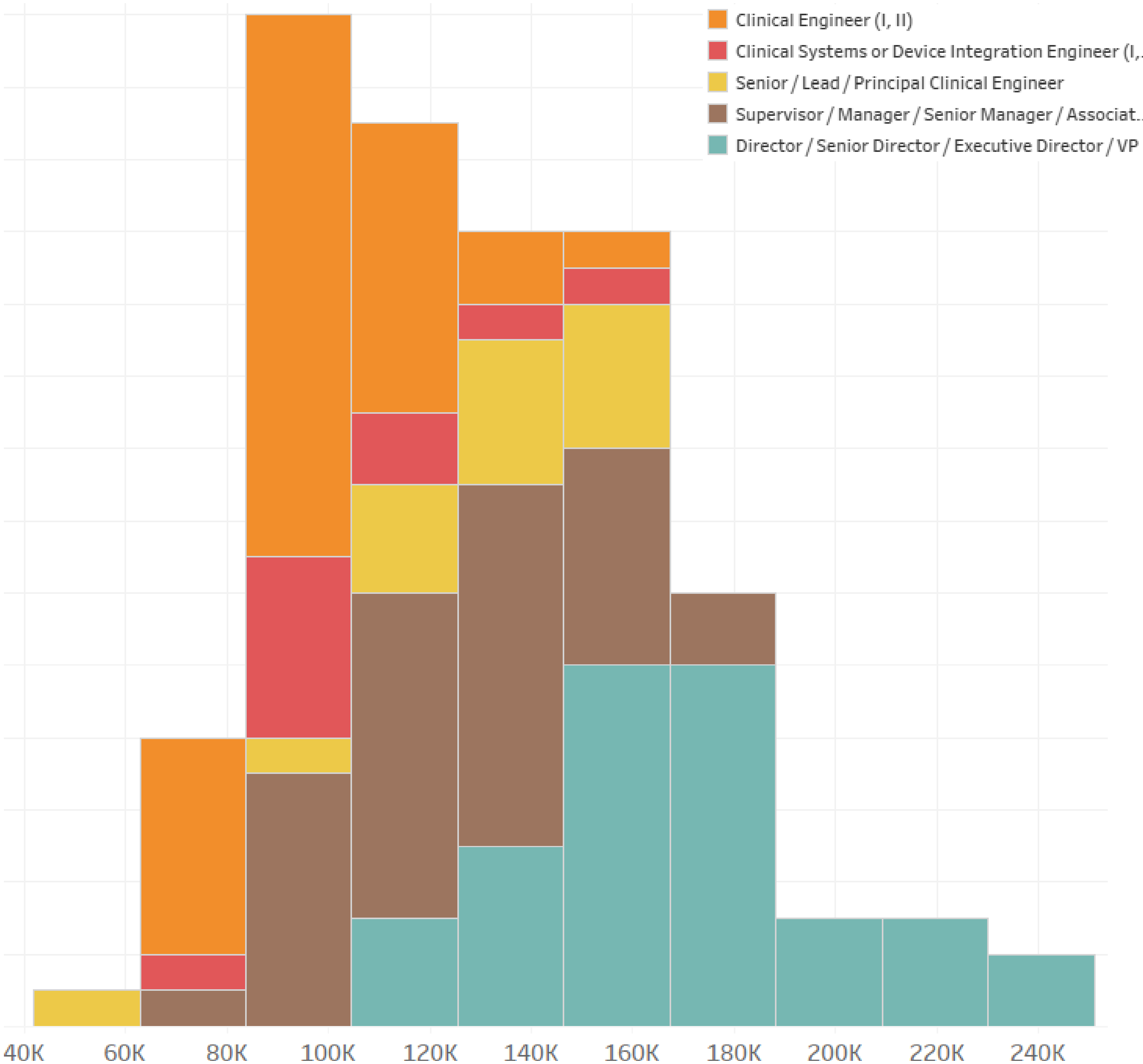
2023 HTM Salary Survey



Data collection and analysis by
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Introduction and Rationale

The clinical engineer specialty occupation is known to employ a limited number of people, even when compared with the biomedical equipment technician profession, which is already in the low tens of thousands at the national level.

According to the U.S. Bureau of Labor Statistics, around 19,000 biomedical engineers were employed in the United States in 2022. It is commonly estimated that clinical and clinical systems engineers represent at most a quarter of that figure.

The same source, in the Occupational Employment Statistics section, shows that the 2022 mean annual wages for biomedical engineers were as follows, depending on the industry sector:

Research and Development	$ 110,310
Manufacturing	$ 104,040
Architectural, Engineering Services	$ 125,220

Moreover, geographic profiles for biomedical engineers in general (thus not industry-specific) indicate for example that in California the annual mean wage is $123,160, whereas in Texas it is $79,810. It is possible to drill down to metropolitan areas: for example, the Los Angeles-Long Beach-Anaheim area presents a median wage of $108,850, whereas the San Francisco-Oakland-Hayward area shows $129,360.

It would be difficult, if not impossible, to extrapolate clinical engineering salaries from this data. Clearly, several variables are at play: industry, geography, seniority, and managerial vs staff title, to name a few.

We aim to provide some more visibility around actual salaries in different geographic areas for each specific position, when possible.

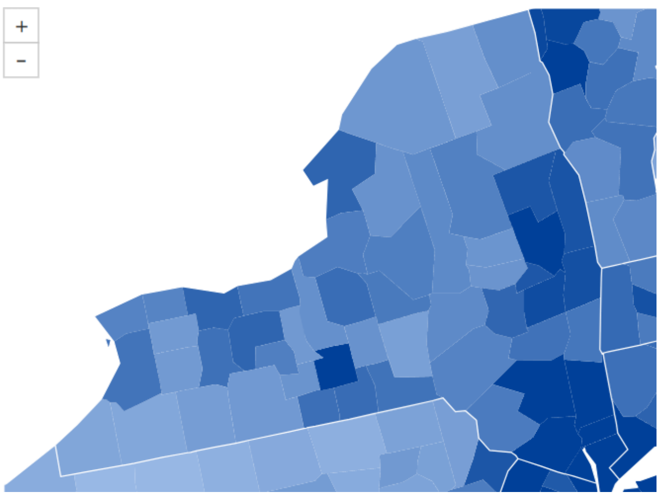
Methodology

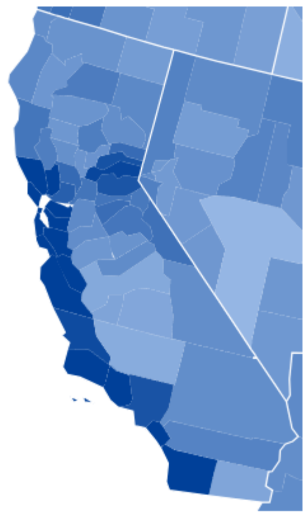
Salary surveys can be quite long. While taking several minutes to be filled out, they can provide details around respondent profile, job satisfaction, pay equity, benefits and bonuses, and productivity.

This survey was meant to be filled out "on the go", thus it contained only four questions: title, total time in the current position (including equivalent positions at previous employers), annual gross salary (excluding bonuses and benefits) and location. This was the smallest set of data that would have allowed for a basic but meaningful representation of median salaries for the different titles across the country. The survey was anonymous.

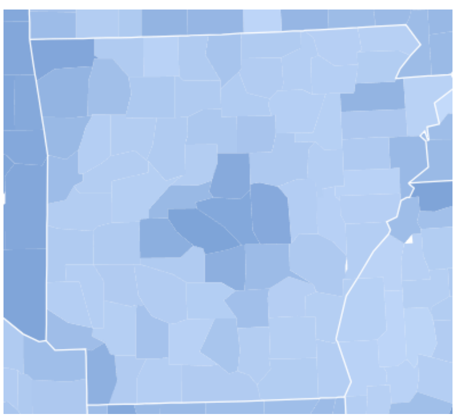
To control for geographic differences, we planned to use the Economic Policy Institute's Family Budget Calculator dataset (https://www.epi.org/resources/budget/budget-map/). The cost of living, defined as the amount of money needed to sustain a certain standard of living, varies significantly in the nation. This measure is often used to compare how expensive it is to live in one location compared to another. It is reasonable to assume that salaries should be adjusted according to the cost of living.

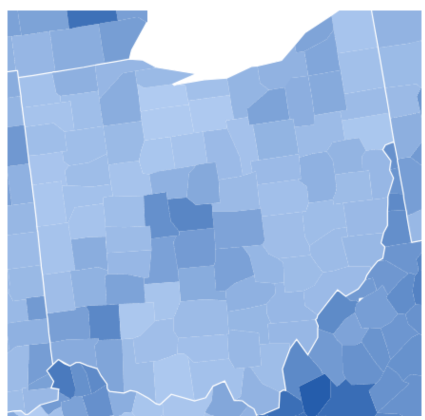
Certain States, like New York or California, present a wide range of cost of living, depending on the specific Metropolitan Area:





Whereas other states, like Arkansas or Ohio, are quite uniform:





In order to preserve the anonymity of the survey, we grouped Metropolitan Areas with similar cost of living (variation of ~10%) together, and we obtained 5 Location Groups for the United States.

Below are the five Groups, with the indication of the specific Metro Areas and/or States:

Group A	**Group D**
METRO AREAS	METRO AREAS
San Francisco, San Jose or Palo Alto CA	Montgomery or Birmingham AL
New York City NY	Sacramento, Riverside or Ontario CA
	Miami, Fort Ld., W Palm Beach or Orlando FL
Group B	Atlanta GA
METRO AREAS	Chicago IL
Oakland or Santa Barbara CA	Indianapolis or Bloomington IN
Greenwich-Stamford-Norwalk CT	Kansas City - MO & KS
Boston MA	Ann Arbor MI
ENTIRE STATES	Raleigh, Durham or Charlotte NC
HI	Philadelphia or Allentown PA
	Charleston SC
Group C	Rapid City SD
METRO AREAS	Nashville TN
Ventura, Oxnard, L.A., Orange County or San Diego CA	Austin TX
Denver or Boulder CO	Salt Lake City UT
Worcester MA	Norfolk, VA Beach, Chesapeake or Richmond VA
Jersey City or Newark NJ	Tacoma WA
Albany-Troy NY	Madison WI
Portland OR	ENTIRE STATES
Washington DC or Alexandria VA	AK, AZ, DE, MD, ME, MN,
Seattle-Bellevue or Vancouver WA	ND, NE, NH, NV, RI, WV, WY
ENTIRE STATES	PARTIAL STATES (REST OF...)
VT	CO, MA, NJ, NY, OR
PARTIAL STATES (REST OF...)	
CT	**Group E**
	ENTIRE STATES
	AR, ID, IA, KY, LA, MS, NM, OH, OK
	PARTIAL STATES (REST OF...)
	AL, CA, FL, GA, IL, IN, KS, MI, MO, MS, NC,
	PA, SC, SD, TN, TX, UT, VA, WA, WI

The cost of living for a two-parent, two-child family for each Location Group is below:

	Group A	Group B	Group C	Group D	Group E
Cost of Living Range	$130k+	$115-130k	$100-115k	$85-100k	$70-85k
Cost of Living Median	$140k	$120k	$105k	$90k	$78k
Cost of Living Coefficient	1.79	1.54	1.35	1.15	1

Given the wide range of tenures (from a few months to over 30 years), we initially thought of “adjusting” salaries. But observing the data and noticing how “green” professionals were reporting salaries comparable with more “seasoned” workers in the same job position, we kept the dollar amounts as is.

In terms of specific positions, we offered following categories:

- BMET (I, II)
- Senior BMET / Lead BMET
- Radiology Equipment Specialist
- Clinical Engineer (I/II)
- Clinical Systems or Device Integration Engineer (I, II)
- Senior / Lead / Principal Clinical Engineer
- Senior / Lead / Principal Clinical Systems or Device Integration Engineer
- Supervisor / Manager / Senior Manager / Associate Director
- Director / Senior Director / Executive Director / VP

Data collection

The survey was open from November 14th to December 15th, 2023 and it was advertised via email, LinkedIn, and word of mouth. The number of responses received was 150.

Number of responses by Location Group

Group A	9
Group B	41
Group C	29
Group D	34
Group E	37

Number of responses by title

Director / Senior Director / Executive Director / VP	37
Supervisor / Manager / Senior Manager / Associate Director	35
Clinical Engineer (I, II)	32
Senior / Lead / Principal Clinical Engineer	14
Clinical Systems or Device Integration Engineer (I, II)	10
BMET (I, II)	9
Senior BMET / Lead BMET	7
Senior / Lead / Principal Clinical Systems or Device Integration Engineer	3
Radiology Equipment Specialist	3

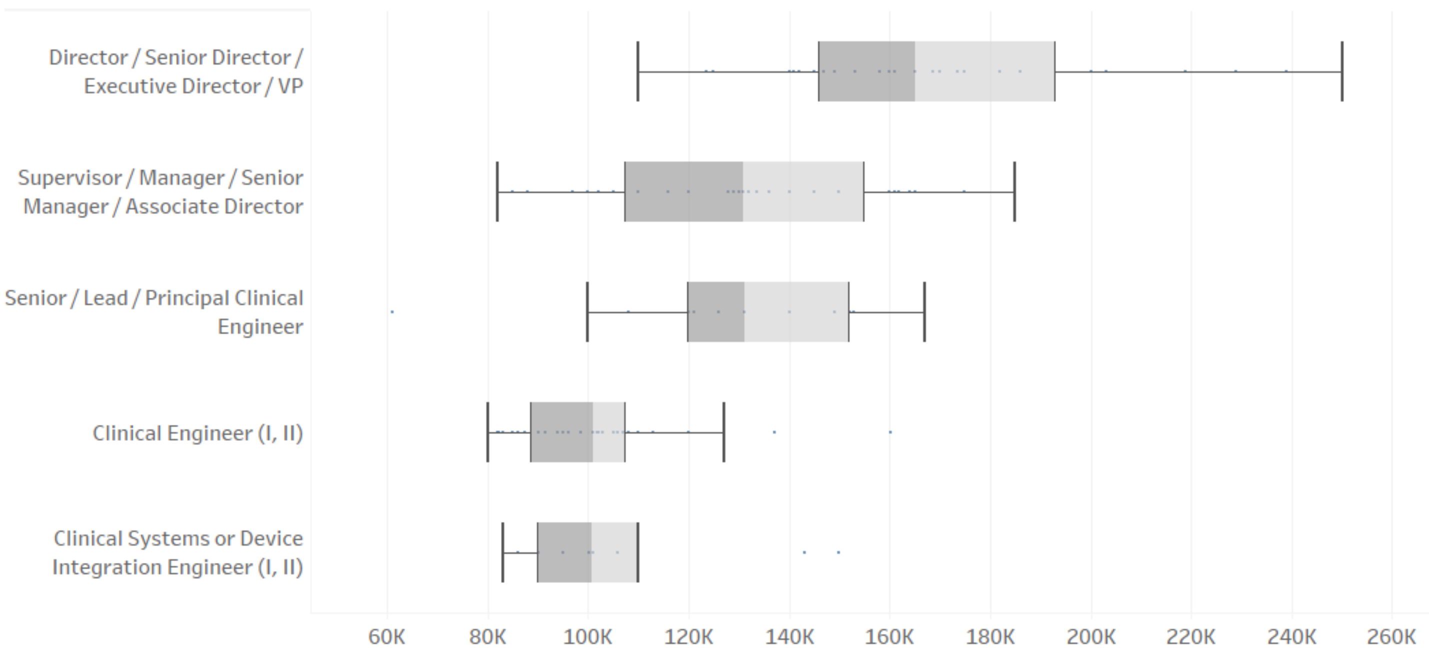
We hoped to receive enough responses for each role. We proceeded with the analysis addressing titles with 10 or more data points.

Data analysis and visualization

The following ranges were obtained per title. Given the presence of extreme values, we chose to use the median as a measure of central tendency. Notably, the median lies closer to most values and is insensitive to outliers.

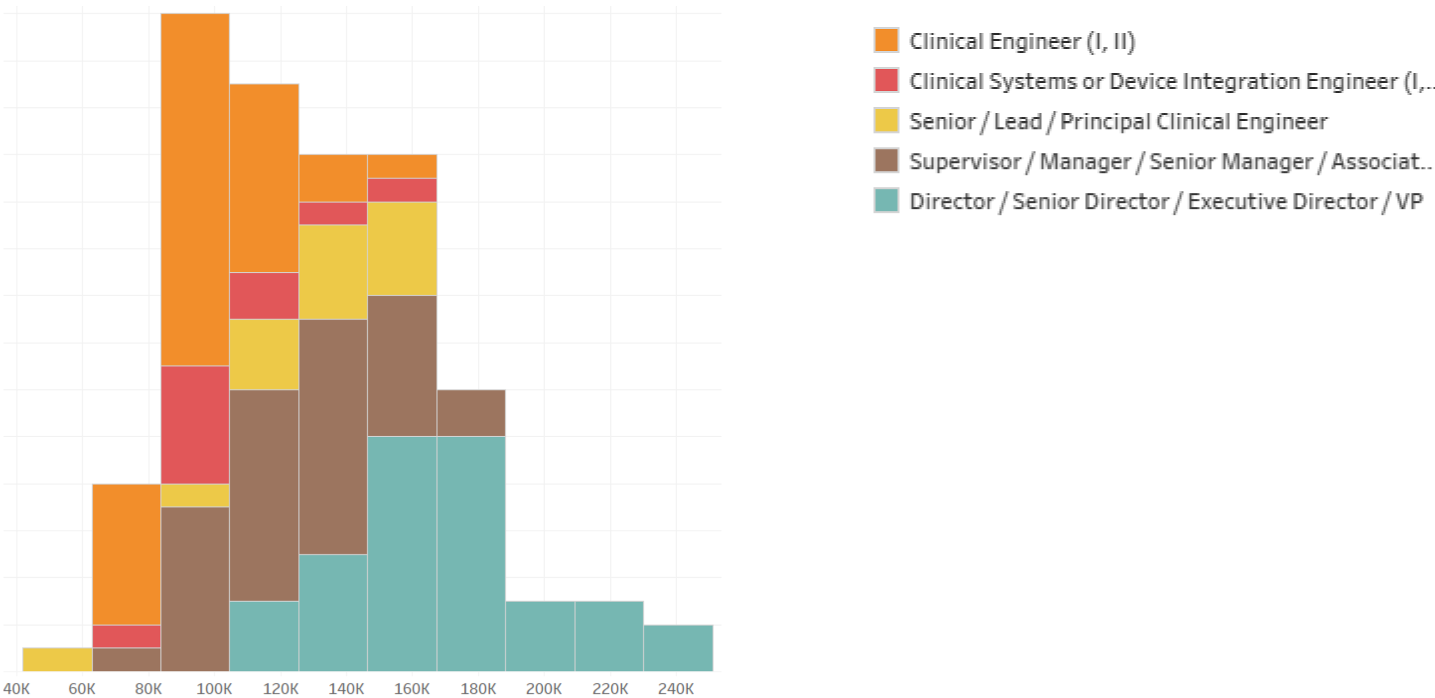
Title	25th perc.	Median	75th perc.
Director / Senior Director / Executive Director / VP	146,000	165,000	193,000
Supervisor / Manager / Senior Manager / Associate Director	108,000	131,000	155,000
Senior / Lead / Principal Clinical Engineer	120,000	131,000	152,000
Clinical Engineer (I, II)	89,000	101,000	108,000
Clinical Systems or Device Integration Engineer (I, II)	90,000	101,000	110,000

A visual representation using box and whisker plots:



Box and whisker plots portray the distribution of our data, outliers, and the median. The box within the chart displays where around 50 percent of the data points fall. The box itself contains the lower quartile, the upper quartile, and the median in the center. The median is the value separating the higher half from the lower half of our data sample. The lower quartile is the 25th percentile, while the upper quartile is the 75th percentile. The whiskers (the lines extending from the box on both sides) typically extend to 1.5* the Interquartile Range (the box) to set a boundary beyond which values would be considered outliers.

The histogram below shows the distribution of salaries and is color coded by title. Certain outliers were excluded.



Below are median salaries for each title and Location Group, based on the data we received. Interestingly, higher salaries do not always correspond with Area Groups with higher cost of living, especially for the CE and Senior CE titles.

Since we did not see this clear correlation between Cost of Living and Salary, we decided not to apply the “Cost of Living Coefficient” we initially planned to use in order to adjust for geographical differences.

Finally, for reference, these are the average tenures, in years, for the different titles.

Average tenures

Title	Tenure
Director / Senior Director / Executive Director / VP	13
Supervisor / Manager / Senior Manager / Associate Director	5
Senior / Lead / Principal Clinical Engineer	9
Clinical Engineer (I, II)	4
Clinical Systems or Device Integration Engineer (I, II)	4