STATISTICAL DEFINITIONS, GUIDELINES, & EXPLAINATION

MEDIAN RATIO

The median ratio is one of the most common statistical measures employed in the mass appraisal performance. It is considered a robust measure of central tendency because it is insensitive to extremely high or low ratios in the sample.
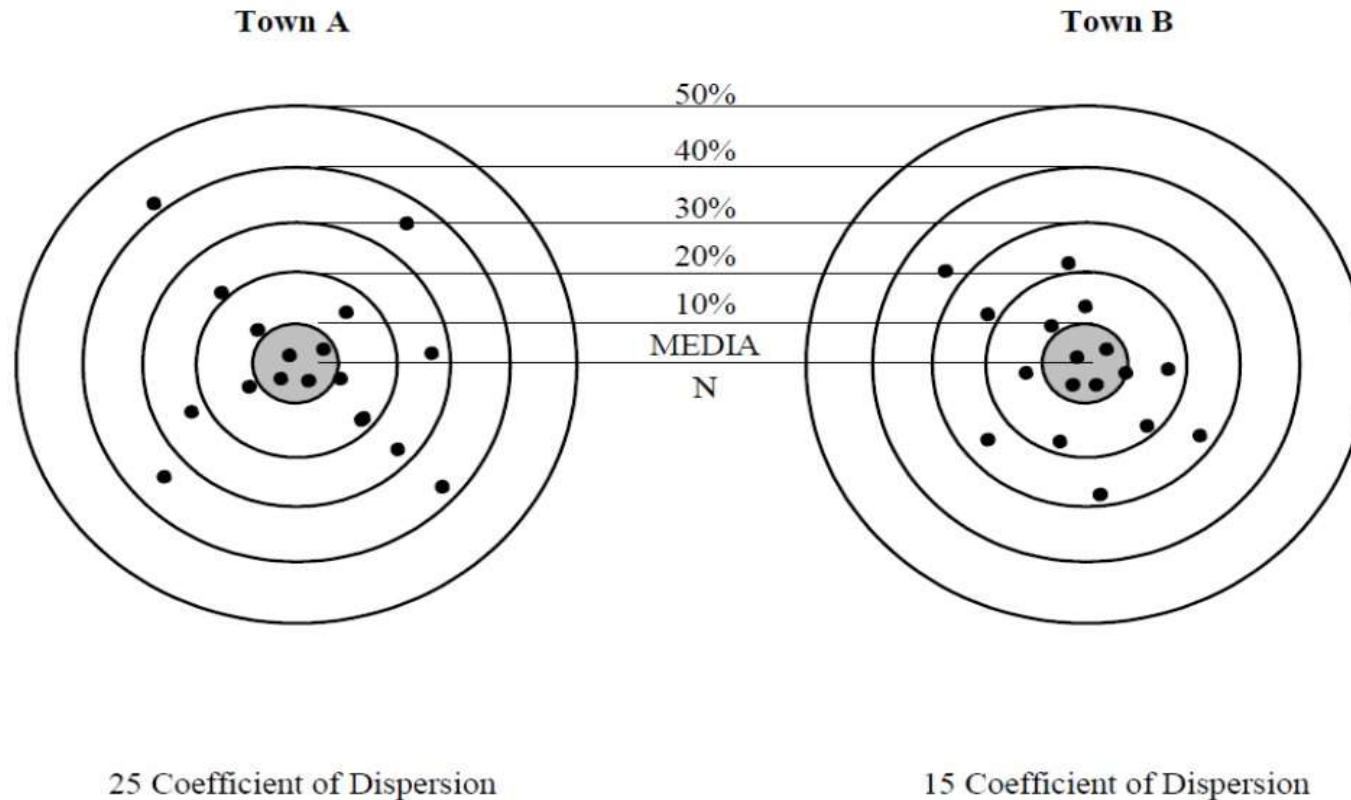
The median ratio is the middle ratio when the individual ratios in a sampling or strata are arrayed in ascending or descending order. If the number of sample ratios is odd, the median is the value halfway through the sorted data set with the equal number of ratios above and below the median.

COEFFICIENT OF DISPERSION (COD)

The COD is calculated by summing the absolute difference between each ratio and the median ratio and dividing the result by the number of ratios in the sample. The average absolute deviation is then divided by the median ratio and multiplied by 100 to obtain a proportional difference. This resulting Coefficient of Dispersion is the relative percentage by which the various individuals differ, on average, from the median ratio. The lower the coefficient of deviation, the more uniform the assessments. A high COD suggests a lack of uniformity. The ideal, but impossible, coefficient of dispersion is 0.

See calculation and example on the next page.

Source: New Hampshire Equalization Manual 2023

Example of Two Coefficients of Dispersion

Town A   Town B

50%
40%
30%
20%
10%
MEDIAN

25 Coefficient of Dispersion   15 Coefficient of Dispersion

Each dot represents one individual assessment/sales ratio.

In Town A the individual assessment/sales ratios are spread out, or dispersed considerably in relationship to the median ratio for the group of properties sold.

In Town B the individual assessment/sales ratios are grouped closely in relation to the median ratio for the group of properties sold.

Source: New Hampshire Equalization Manual 2023

PRICE-RELATED DIFFERENTIAL (PRD)

The price-related differential is a statistic for measuring assessment regressivity or progressivity. Appraisals are considered regressive if high-value properties are under-appraised relative to low-value properties and progressive if high-value properties are relatively over-appraised. A PRD of 1.00 is the most desirable state and indicates that no assessment bias exists between the low and high value properties. A PRD greater than 1.00 suggests that high-value properties may be under-appraised relative to the lower value properties.

SUMMARY OF GRAPH ON FOLLOWING PAGE

The graph on the following page utilizes the results of each annual equalization study since the last Town wide assessed value update in New Ipswich in 2019. The results appear to indicate that the COD, and PRD have remained acceptable; while the median assessment to sale ratio has declined and no longer falls within an acceptable range.

According to "Assessment Review Standards for Monitoring of Local Assessment Practices by the Department of Revenue Administration" Adopted by the Assessing Standards Board on April 14, 2023. Standards pertaining to Median Ratio, COD, and PRD are described as follows:

1. Level of Assessments. The DRA shall determine if the median ratio falls between 0.90 and 1.10, inclusive, with a 90% confidence interval in the year of the review.

2. Uniformity of Assessments. The DRA shall determine if the overall coefficient of dispersion (COD) for the municipality's median ratio is not greater than 20.0 without the use of a confidence interval.

3. Determining the municipality's price related differential (PRD) is between .98 and 1.03, inclusive, with a 90% confidence level.

Source: New Hampshire Equalization Manual 2023
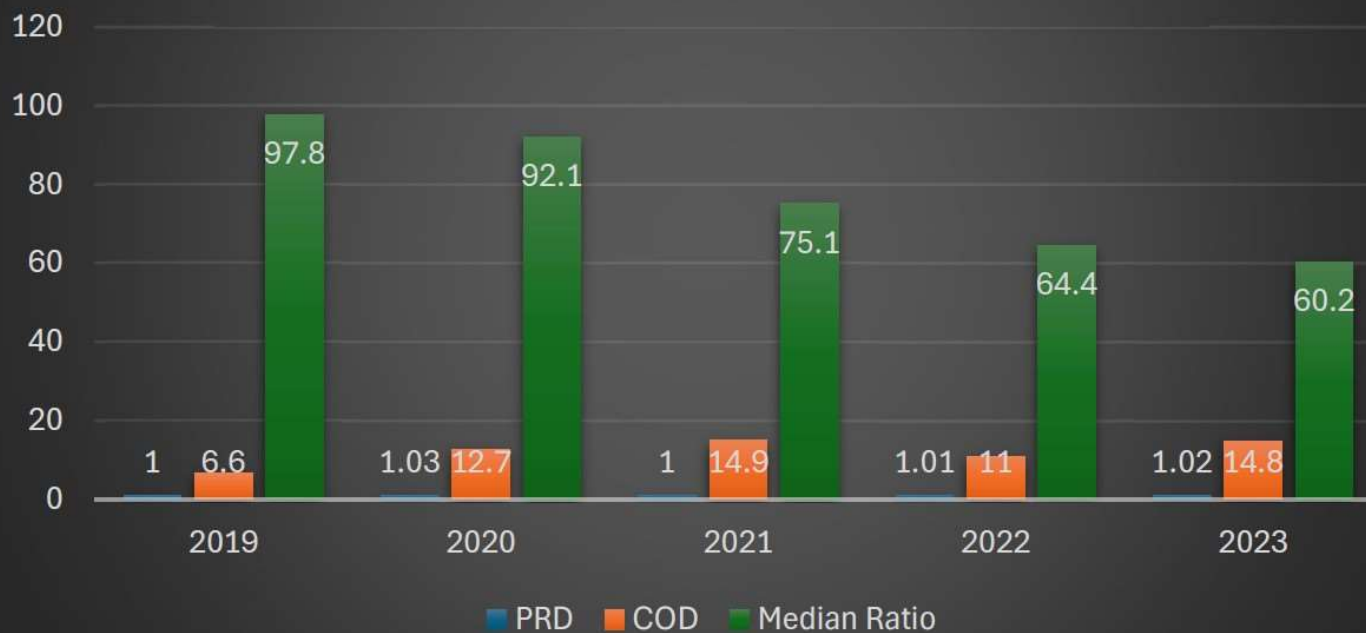
Source: NH Department of Revenue Administration Equalization Bureau