

Description of calculating standard deviations for the Disease Based Price Indexes (DBPI)

DBPIs are calculated using MEPS annual utilization data as quantities and CPI and PPI monthly medical service indices as prices. Thus, each of the data sources contribute to the variances of DBPIs. Calculating the total variance of a DBPI would require knowing the covariance between the MEPS quantities and CPI/PPI medical prices, which is unknown. We only attempt to address the variability from MEPS quantities, which is likely to be the largest source of variation for many of the indexes.

To estimate the variances of the indexes, we use the bootstrapping method. Each year, a total of 20 samples are created from MEPS quantities data using probability proportional to size (PPS) sampling with replacement. Sampling weights are personal weights in MEPS data and each sample is selected to have the same number of observations as the original sample. New DBPIs are then calculated using the 20 bootstrapped sample quantities and the same CPI/PPI prices in order to estimate sample variances each period. The standard deviation is calculated as the square root of the variance of one month price changes across the bootstrapped samples.

The reported values are the standard deviations of the month-to-month change in the index (i.e., they are not cumulative). Since MEPS quantities are updated each year, the standard deviations spike in January and are lower in the other months of the year. For dental diseases, we directly use the CPI dentist indexes as given thus the reported standard deviation is zero (so no variation arises from the use of MEPS data for the dental index).