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Survey Weights in the
Physician Practice Information Survey

The summary statistics for the Physician Practice Information (PPI) Survey that were provided by AMA to CMS on March 31, 2009 and to each of the 42 specialties on June 25, 2009 were weighted to correct for non-response bias. We received input from NORC as we developed the PPI weights, and the final methodology that was used received their approval. This short report summarizes the methodology, and an attached document from NORC provides more detail.

AMA first explored how survey response and preliminary means for certain variables differed across physician characteristics. Weighting requires information on responders and non-responders, and the AMA Physician Masterfile, from which the survey sample was drawn, is the only source for that information. In looking at who responded to the survey, we found that AMA membership and practice type were statistically correlated with response more often that other factors such as gender, various area definitions, board certification, and age. There were also indications that they were correlated with the means of certain variables. Therefore, we selected those two factors, in addition to Medicare specialty, as candidates that would define our weighting cells. We explored using additional factors, but found that they led to cell sizes that were judged to be "too small."

Construction of "General Weights"

The general weights are used to weight data in the survey *other than the practice expense data*. Cells for the general weights were based on AMA membership and practice type. AMA membership is a two category yes/no variable. The three category practice type variable is defined as follows from the "present employment" variable on the AMA Masterfile:

Small practice = "self-employed solo practice," or "two physician practice (full/part owner or employee"

Group practice = "group practice"

Other practice = all other values of the present employment variable

Thus, for each specialty, there were 2 * 3 = 6 potential cells.

The general weight for each physician in a cell is the number of eligible physicians in the population of that cell (from the Masterfile) divided by the number of physicians with complete data in that cell. For example, if there were 100 non-federal, post-residency, patient care internal medicine physicians who were AMA members in small practice in the U.S., and 20 of them had complete responses to the PPI Survey, each of those 20 would receive a weight of 100 / 20 = 5.

In six specialties (anesthesiology, emergency medicine, general practice, interventional radiology, osteopathic manipulative therapy, and radiology), at least one of the six cells had only no or only one physician with complete data. In those cases, we combined the member and non-member cells. After that, we constructed the weights as described above.

Construction of "Expense Weights"

Response to the expense section of the PPI Survey was lower than that to other sections. Therefore, we constructed different weights for use with the expense data that reflected this lower response and, to the extent possible, allowed us to weight the physicians with expense data so that they were representative of eligible physicians in each of the specialties. Because response to the expense section (relative to response to the survey in general) also differed across specialties, had we used the general weights for the expense questions, this would have led to average expense data that would not have been representative of the physician population at large.

Weighting cells for the expense data were based only on practice type. AMA membership was not used to define the weighting cells here becuase it would have resulted in small cell sizes for many specialties and because expenses did not tend to differ significantly between members and non-members. In addition, cells were defined based on two practice type categories rather than three—we combined the group practice and other practice categories. Thus, for the purpose of expense weights, each specialty, except for two, had only two cells. For nuclear medicine and osteopathic manipulative therapy we combined all cells into one, and their practice expense data was not weighted within specialty.

The expense weight for each physician in a cell is the number of eligible physicians in the population of that cell divided by the number of physicians with complete *expense* data in that cell. For example, if there were 300 non-federal, post-residency, patient care internal medicine physicians in small practice in the U.S., and 40 of them had complete responses to the expense section of the PPI Survey, each of those 40 would receive a weight of 300 / 40 = 7.5.

Other Adjustments

There are two final issues with regard to the weights that concern eligibility. First, during the survey process we learned from physicians who were contacted that some of them were ineligible for the survey—they were either in residency, deceased, retired, did not provide patient care, were employed by the federal government, or worked part time. Approximately 10% of physicians who were contacted were found to be ineligible for one of those reasons. We adjusted the population cell sizes downward for such ineligibility. In the above example, had we found 10% of contacted internal medicine physicians to be ineligible, we would have reduced each of the cell sizes in that specialty by 10%. The population of AMA member internists in small practice would have been reduced from 100 to 90, and the general weight would be 90 / 20 = 4.5. Similarly, the expense weight for internists (member and non-member) in small practice would be 270 / 40 = 6.75.

Second, a very few physicians indicated that they practiced in some specialty other than the one in which we had them listed. We "moved" them to the population (and complete data) in their new specialty, and reduced the population in their original specialty in a fashion similar to the percentage reduction for ineligibility, explained above.