Muse & Associates

*Suite 520*
*1775 Eye Street, NW*
*Washington, DC 20006*
*(202) 496-0200*
*FAX: (202) 496-0201*

# Memorandum

**To:** Ruth Constant, Ed.D.
Chairman of the Board
National Association for Home Care & Hospice

Mr. Val J. Halamandaris, President
National Association for Home Care & Hospice

**From:** Mick Cowles
Don N. Muse, Ph.D.

**Date:** June 11, 2003

**Re:** Home Health Agency Cost Report Analysis

---

## Background

The Medicare Payment Advisory Commission's March 2003 Report to Congress contained a set of specific recommendations regarding Medicare reimbursement policy for home health agencies. These recommendations were based partially on an analysis of home health agency Medicare Cost Reports. The National Association for Home Care & Hospice (NAHC) is in the process of conducting their own in-house analysis of home health agency Medicare Cost Reports. The purpose of this memorandum is to evaluate the validity of the collection procedures that the NAHC used to build a database with a larger sample size than that used by the Medicare Payment Advisory Commission (MedPAC). We will also comment on the adequacy and appropriateness of the methodology employed by the NAHC in terms of the resultant sample size, with particular emphasis on the data collection methodology vis-à-vis MedPAC.

## The MedPAC Study

Our review of MedPAC's March 2003 Report to Congress relied on an evaluation of the report itself and also a series of informal interviews with Sharon B. Cheng. Ms. Cheng had primary

responsibility for the section of the MedPAC report regarding home health agency reimbursement. The informal interviews were conducted by telephone and in person on June 4 and 5. Because of timing deadlines associated with the production of the report, Ms. Cheng was only able to obtain slightly in excess of seven hundred home health agency Medicare Cost Reports, all of which were for freestanding agencies, for cost report periods ending during Federal Fiscal Year 2001. It was unclear whether there were no Medicare Cost Reports available for hospital–based agencies, or if the number was so small that it was thought not to have statistical validity.

Prior to the aggregation and computation of group margins, MedPAC threw out certain observations, either because they were very low volume providers, they were not in the United States, or they were duplicates. They also used "trim edits" to identify and discard "outliers." The trim edits were based on the distribution of the natural log of the ratio of Medicare costs to Medicare revenues for each home health agency. The trim edit methodology was very conservative, meaning that it would only eliminate the most extreme outliers. The net result of these edits was to reduce MedPAC's sample size from "slightly in excess of 700" to "slightly less than 700." This sample size represented about 10 percent of all certified home health agencies as of the end of 2001, or 15 percent of freestanding facilities. The sample was one of convenience, i.e., what was available, not scientifically drawn to be representative.

In their Report to Congress, MedPAC expresses a concern about the number of cost reports they were able to obtain. "The small size of the current sample – 10 percent of all agencies reporting – suggest caution in interpreting the results we do have and tends to preclude further disaggregation." (p. 107) The NAHC has undertaken a study that will, among other things, attempt to replicate the findings in the MedPAC report, but using a much larger sample size.

MedPAC computed Medicare profit margins by subtracting total reimbursable Medicare costs from total Medicare revenue, and then dividing that difference by total Medicare revenue. This is the same way MedPAC computes Medicare margins for other types of providers such as hospitals and nursing homes. MedPAC's reported Medicare margins are "weighted," which is consistent with what they have historically done for other types of providers. Weighting requires aggregating costs and revenues for the group being averaged prior to the margin computation. The effect of weighting is to count larger facilities more heavily than smaller ones.

**The NAHC Study**

The NAHC filed Freedom of Information Act requests with each of the Regional Home Health Intermediaries requesting a machine-readable copy of every home health agency Medicare Cost Report for any and every cost report period ending after September 30, 2000. This was done in an attempt to obtain a significantly larger sample than had been achieved by MedPAC. Fortunately, all of the Regional Home Health Intermediaries provided data. The data was received during March and April of 2003. The NAHC also obtained the "public use file" for hospital Medicare Cost Reports so as to capture data for hospital-based home health agencies. As of June 5, 2003, NAHC had obtained 6,314 readable cost reports.

A portion of the data from one of the Regional Home Health Intermediaries, Palmetto Government Benefits Administrator, was in a different format than the rest of the data. The format required using different software to import the data. The NAHC research team was in receipt of the new software as of June 5, but, as of that date, this portion of the data from Palmetto had not yet been imported. Therefore, the 6,314 cost reports referenced above exclude approximately 1,800 Palmetto reports. Palmetto primarily serves Kentucky, North and South Carolina, Tennessee, Alabama, Florida, Georgia, Mississippi, Arkansas, Louisiana, New Mexico, Oklahoma, Texas, Illinois, Indiana, and Ohio. The NAHC was able to include in its sample approximately 1800 other Palmetto cost reports. Additionally, Palmetto is not the only Home Health Intermediary serving those States. Home health agencies owned by chains are assigned intermediaries independently of their location. Further, cost report information from hospital based agencies in the Palmetto states is included in the sample. As a result, these States are not completely excluded from the NAHC sample data, only partially represented. We believe, however, that these States may be systematically different from the rest of the country such that their partial exclusion may create a limited sample bias.

The 6,314 cost reports that NAHC successfully imported included 2,027 hospital-based home health agencies and 4,287 freestanding agencies. NAHC researchers replicated the exact same exclusion criteria and trim edits that were employed by MedPAC. This left 5,213 cost reports that they were able to use in their analysis. These consisted of 1,763 hospital-based agencies and 3,450 freestanding. The NAHC computed both weighted and unweighted average Medicare profit margins. Because of their larger sample size, they were able to disaggregate the averages in ways that the MedPAC research team could not.

The usable sample size that the NAHC research team was able to achieve is significant relative to MedPAC. The 5,213 usable cost reports represented no less than 3,512 unique provider numbers (1,428 hospital and 2,084 freestanding). Using the Center for Medicare and Medicaid Services' Online Survey Certification and Reporting (OSCAR) database as of December 2001, we were able to determine that, as of the end of calendar year 2001, there were 4,744 freestanding agencies and 2,007 hospital-based agencies. Thus, NAHC's usable sample included almost half of all participating freestanding home health agencies and more than three quarters of hospital-based facilities. Such a large sample is, from a research point of view, adequate to compute detailed breakouts of average profit margins for cell sizes in excess of approximately 50 providers.

## Some Comments on Aggregation

In addition to our central purpose, we were asked to comment on the methodological issues associated with weighting. One of the differences between the MedPAC and NAHC research is that MedPAC limited their margin analysis to weighted averages. They aggregated the costs and revenues for the group (the entire country) prior to computing the margin, which gives more weight to large facilities than it does to small. Such aggregation is methodologically appropriate to research questions relating to the home health industry overall, particularly under the assumption of homogeneity. If, however, there are differences among agencies, then aggregation tends to obfuscate what is going on. For example, the loss of small rural agencies in the South may be statistically hidden by the profitability of some large New York agencies.

There is no statistically 'correct' way to aggregate. The appropriate degree of aggregation or disaggregation is a function of the research question. MedPAC was interested in what was happening to the industry as a whole. While the NAHC researchers shared MedPAC's interest in what was happening overall, they also wanted to measure what was happening to individual providers. In order to address the impact at the individual agency level, NAHC needs to disaggregate the cost report data. Such disaggregation, however, introduces a methodological problem. If each facility is given the same weight, how does one handle the issue of multiple cost reports for the same provider or differing lengths of cost report periods? We recommend computing 'unweighted' averages by actually weighting by the number of months in the cost report period. Under such a weighting scheme, if two facilities filed 12 month cost reports, they would receive equal weight, which is consistent with the notion of an unweighted average. We believe that weighting by month maintains the intuitive interpretation of unweighted averages while still allowing for the vagaries in the way cost report data are organized.

## Conclusion

We draw four conclusions.

1. The usable sample size that the NAHC research team was able to achieve is significant relative to MedPAC.

2. The NAHC research team has accurately replicated the methodology used by MedPAC in their March 2003 Report to Congress.

3. NAHC's usable sample of cost reports will have the statistical 'power' to allow the computation of detailed analyses of home health agency Medicare profit margins with cell sizes on average as low as approximately 50.

4. NAHC achieved a 100 percent response rate to their Freedom of Information Act requests from the Regional Home Health Intermediaries.

Note that the first, third, and fourth conclusions above are strengthened upon NAHC's successful importation of the missing Palmetto data so as to avoid any potential sample bias.