



Transmitted electronically

April 13, 2011

Donald Berwick, M.D.
Administrator
Centers for Medicare & Medicaid Services
Hubert H. Humphrey Building
200 Independence Avenue, S.W., Room 445-G
Washington, DC 20201

Dear Dr. Berwick:

As the Centers for Medicare & Medicaid Services (CMS) considers the appropriate level of adjustment for documentation and coding to payments under the hospital inpatient prospective payment system (PPS) for fiscal year (FY) 2012 and beyond, we would like to present an independent assessment of the methodology that CMS has used in its calculations. This assessment was prepared by Joseph P. Newhouse, Ph.D., the John D. MacArthur Professor of Health Policy and Management at Harvard University and Faculty Research Associate of the National Bureau of Economic Research. Dr. Newhouse is a recognized expert on health economics and payment policy and serves on the Congressional Budget Office (CBO) Board of Health Advisors, co-chairs the 2010 Technical Review Panel on the Medicare Trustees Report, and has served as the vice-chair of the Medicare Payment Advisory Commission.

As described in the attached memo, Dr. Newhouse finds that the methodology CMS has employed cannot separate documentation and coding effects from true case mix change because it uses claims data alone. He uses index number methods to examine the specific elements of the CMS calculation, finding that the best one can do with claims data alone is to calculate the upper and lower bounds of the *combined effect* of documentation and coding and true case mix change. **The CMS estimate of documentation and coding change is significantly higher than what Dr. Newhouse calculates as the upper bound of this combined effect. CMS also does not consider the fact that there is a wide range for the combined effect (i.e., as shown by the lower bound calculated by Dr. Newhouse) and ends up with an artificially high number.** He goes on to say:

“The values that I interpret as upper and lower bounds of documentation and coding change and true case mix change are not, however, what CMS has calculated. Moreover, I cannot interpret what exactly is measured by what CMS terms the documentation and coding effect.”

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Dr. Newhouse instead recommends a method based on the random sampling of hospital charts from different years coded based on current practices. This method holds coding practices constant and indicates the amount of true case mix change.

If CMS is not willing to use a methodology that adequately separates true case mix change from documentation and coding, then it should use its policy discretion to account for real case mix change in its calculations by decreasing its estimate of documentation and coding change.

We appreciate the opportunity to share this information and look forward to working together to ensure that CMS' documentation and coding policy is appropriate and workable. If you have any questions, please contact Caroline Steinberg at AHA at (202) 626-2329 or csteinberg@aha.org.

Sincerely,

American Hospital Association
Association of American Medical Colleges
Federation of American Hospitals

cc: Ms. Marilyn Tavenner, Principal Deputy Administrator
Mr. Jonathan Blum, Deputy Administrator and Director, Center for Medicare
Mr. Richard S. Foster, Chief Actuary, CMS Office of the Actuary
Dr. Mark Miller, Executive Director, Medicare Payment Advisory Commission

Enclosure

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Dear Caroline, Karen and Steve,

I have reviewed the materials the American Hospital Association (AHA) sent me pertaining to the CMS estimates of documentation and coding effects and true case mix change.¹ I have three principal reactions:

1. Use of claims data, which CMS employs in its calculations, inherently combines both true case mix change and documentation and coding change. The pure or “true” case mix change cannot be determined from claims data alone.
2. What can be determined from claims data alone is an estimate of the *combined* effect of documentation and coding and true change, but the size of the estimated combined effect is

¹ These materials include: the relevant pages from the May 4, 2010 Inpatient Prospective Payment System (IPPS) Proposed Rule on these estimates; the relevant pages from the August 16, 2010 Final Rule; the relevant pages of the June 11, 2010 comment letter by AHA on the Proposed Rule; the May 27, 2010 comment letter by MedPAC on the Proposed Rule; the July 20, 2010 letter from the AHA, the FAH and the AAMC to Donald M. Berwick, M.D. which referenced two independent studies, one by The Moran Company and one by Partha Deb, Ph.D.; the August 6, 2010 letter from Donald Berwick, M.D. to Rich Umbdenstock in response to the letter sent to him; and a table produced by the Moran Company that provides CMIs for various combinations of the FY 2007 and 2009 claims and groupers.

sensitive to whether one uses initial or final year groupers in the calculation. There is an exact correspondence between this problem and standard price or quantity index calculations that are done by the Bureau of Labor Statistics and the Bureau of Economic Analysis. I believe looking at the problem as one of calculating index numbers allows one to calculate values that one can interpret as upper and lower bounds on the sum of the documentation and coding and true case mix change. I describe this in a Technical Appendix to this letter. I show there the upper and lower bounds on the sum of true case mix change and documentation and coding that the data supplied me yield.

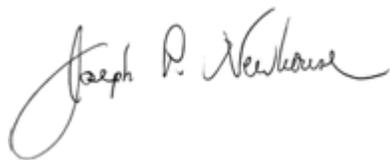
3. The values that I interpret as upper and lower bounds on the sum of documentation and coding change and true case mix change are not, however, what CMS has calculated. Moreover, I cannot interpret what exactly is measured by what CMS terms the documentation and coding effect.

I briefly elaborate on these points in the remaining body of this letter.

The ideal method for distinguishing documentation and coding effects from true case mix change effects is as follows. One pulls a random sample of hospital charts from different years and has coders code them blind to the year of the chart. Since the coders are presumptively using one standard (the current standard) of coding, this method holds coding practices constant and indicates the amount of true case mix change. This method was employed two decades ago in work at RAND that was sponsored by the Health Care Financing Administration (HCFA) and the Prospective Payment Assessment Commission (ProPAC). I was part of this work, which was documented in Carter, et al., "How Much Change in the Case Mix Index is DRG Creep?" *Journal of Health Economics*, 9:4, 1990, 411-28. The resulting estimate was subsequently used for several years by ProPAC to estimate documentation and coding effects. This sketch of the ideal method should clarify that the problem with the method that CMS has used is that one cannot get an estimate of case mix change that is not combined with documentation and coding change from claims data alone. They are inherently confounded in claims data.

There is an exact analogy between this problem and the calculation of standard price and quantity indices by the Bureau of Labor Statistics and the Bureau of Economic Analysis as described in the Technical Appendix. Using index number theory, one can show that claims data can yield upper and lower bounds on the sum of true case mix change and documentation and coding change. These bounds, however, are not what CMS has calculated. Moreover, using the index number framework I cannot interpret the value CMS has calculated for documentation and coding change.

Regards,

A handwritten signature in cursive script that reads "Joseph P. Newhouse". The signature is written in dark ink and is positioned below the "Regards," text.

Joseph P. Newhouse

Technical Appendix

Because consumers substitute away from goods whose relative price has risen, it is well known in the economics literature that the use of initial period quantity weights, a Laspeyres index, leads to higher values of price index changes than use of final period quantity weights, a Paasche index. For the same reason quantity indices (e.g., real GDP growth) are biased up using initial period price weights and biased down using final period price weights. The classic description of these biases is Ragnar Frisch, "Annual Survey of General Economic Theory: The Problem of Index Numbers," *Econometrica*, 4, January 1936, pp. 1-38, but a more accessible modern reference is Jack E. Triplett, "Economic Theory and BEA's Alternative Price and Quantity Indices," *Survey of Current Business*, April 1992, pp. 49-52, which is available at http://fraser.stlouisfed.org/publications/SCB/1992/download/17281/SCB_041992.pdf. Index number theory is also covered in any textbook dealing with economic measurement.

In the present problem the relative case weights in a given grouper are like relative prices in a price index calculation (in fact they *are* relative prices for the different MS-DRGs) and the quantities of discharges in various MS-DRGs are like the quantities of goods in the price index calculation. Unlike consumers, whose behavioral response to a rise in relative prices is to buy *less* of those goods whose relative prices have risen, hospitals are assumed to be *more* likely to enter codes whose weights (relative prices) have risen. This results in a sign change in the bias from the price index case, meaning that the use of the weights in the initial period grouper (analogous to initial period price weights) leads to an understatement of – meaning it is a lower bound on – the amount of documentation and coding plus true case mix change and use of weights from the final period grouper leads to an overstatement, meaning it is an upper bound on the amount of documentation and coding plus true case mix change.

If one looks at this problem in index number terms, both p (the weights in the grouper) and q (documentation and coding + true CMI change) have changed from 2007 to 2009. A traditional index number method to calculate a change in q (documentation and coding + true CMI) is to hold p constant using each of the groupers in turn. Because of the behavioral change (coding change), the result is sensitive to which grouper one uses. In the data that the AHA supplied me (Table 1), the value of the CMI obtained by running the 2009 claims through the 2007 grouper is 1.5046 (call this A). The CMI obtained by running the 2007 claims through the same 2007 grouper is 1.5149 (call this B), that obtained by running the 2009 claims through the 2009 grouper is 1.5871 (call this C) and the CMI obtained by running the 2007 claims through the same 2009 grouper is 1.5187 (call this D). Since I do not have the individual CMIs used by CMS in its calculations, I am using these as estimates of the values CMS used. The change in the value of the CMI using the 2007 grouper on the 2009 and 2007 claims, a Laspeyres quantity index, is $A/B = 1.5046/1.5149 = 0.993$, meaning that the lower bound on true CMI change plus any documentation and coding is -0.7 percent. If, instead of the 2007 grouper, one uses the 2009 grouper on the 2009 and 2007 claims, the value is $C/D = 1.5871/1.5187 = 1.045$, a Paasche quantity index which gives an upper bound on the sum of the two effects. (I reiterate that the biases are reversed from the standard index number context.)

CMS appears to have used the four numbers I used in the previous paragraph, but has used them in a different way to reach values I cannot interpret. CMS appears to have calculated C/A , for which it got a value of 1.056, which in index number terms is a price index using final period quantities (i.e., a Paasche price index). CMS calls this the sum of documentation and coding and a measurement effect. Using the Paasche price index interpretation, I interpret the resulting value for C/A as an upper bound on a grouper effect or measurement effect. CMS then calculates D/B , for which it obtains a value of 1.0019. In index number terms this is a price index using initial period quantities (i.e., a Laspeyres price index). Moreover, CMS seems to have gone on to calculate $[(C/A)/(D/B)]$, for which it obtains a value of 1.054, and calls this a documentation and coding effect.

In index number terms, CMS has divided a Paasche price index by a Laspeyres price index and called the result a documentation and coding effect. I simply cannot interpret the ratio of a Paasche and Laspeyres price index.

Table 1
Calculation of the Upper and Lower Bounds of Documentation and Coding Plus True Case Mix Change

	CMIs from Hospital Groups ²	Interpretation
A CMI: FY 2009 Claims with FY 2007 Grouper	1.5046	
B CMI: FY 2007 Claims with FY 2007 Grouper	1.5149	
A/B	.993	Lower bound on documentation and coding plus true case mix change – Laspeyres quantity index
C CMI: FY 2009 Claims with FY 2009 Grouper	1.5871	
D CMI: FY 2007 Claims with FY 2009 Grouper	1.5187	
C/D	1.045	Upper bound on documentation and coding plus true case mix change – Paasche quantity index

Table 2
CMS Calculations and Interpretation

	CMS Calculations	Interpretation
C CMI: FY 2009 Claims with FY 2009 Grouper		
A CMI: FY 2009 Claims with FY 2007 Grouper		
C/A	1.056	Upper bound on grouper effect or measurement effect – Paasche price index
D CMI: FY 2007 Claims with FY 2009 Grouper		
B CMI: FY 2007 Claims with FY 2007 Grouper		
D/B	1.0019	Lower bound on grouper effect or measurement effect – Laspeyres price index
(C/A)/(D/B)	1.054	Not interpretable under index number theory

² The CMIs provided to me by the hospital groups were produced by The Moran Company and attempt to replicate CMS' CMI calculations as closely as possible based on the proposed and final FY 2011 inpatient PPS rules and associated data.