MEMORANDUM

Date: May 1, 2007

To: Potential sponsors of public reports incorporating AHRQ Quality Indicators

From: Shoshanna Sofaer, Dr.P.H., Baruch College

Subject: Guidance in using the Hospital Quality Model Reports

A research team from the School of Public Affairs, Baruch College, under contracts with the Department of Public Health, Weill Medical College and Battelle, Inc., has developed a pair of Hospital Quality Model Reports at the request of the Agency for Healthcare Research & Quality (AHRQ). These reports are designed specifically to report comparative information on hospital performance based on the AHRQ Quality Indicators (QIs). The work was done in close collaboration with AHRQ staff and the AHRQ QI team. This memorandum briefly describes the research and development undertaken to develop these Model Report. It then provides guidance to sponsors who wish to utilize one of the Model Reports in crafting public reports to their target audiences that incorporate AHRQ QI information.

A. What informed these Model Reports?

The Model Reports are based on:

- Extensive search and analysis of the literature on hospital quality measurement and reporting, as well as public reporting on health care quality more broadly;
- Interviews with quality measurement and reporting experts, purchasers, staff of purchasing coalitions, and executives of integrated health care delivery systems who are responsible for quality in their facilities;
- Two focus groups with chief medical officers of hospitals and/or systems and two focus groups with quality managers from a broad mix of hospitals;
- Four focus groups with members of the public who had recently experienced a hospital admission; and

- Four rounds of cognitive interviews (a total of 62 interviews) to test draft versions of the two Model Reports with members of the public with recent hospital experience, basic computer literacy but widely varying levels of education.

B. What distinguishes the two Model Reports from each other?

The first Model Report was developed in mid-2006, at a time when the AHRQ QIs existed exclusively in the form of individual indicators. AHRQ's charge to Baruch at that time was to develop a report that would focus on the Inpatient Quality Indicators (IQIs) and the Patient Safety Indicators (PSIs). A set of Pediatric Quality Indicators (PedQIs) was under development at that time, but not sufficiently advanced to be incorporated into the initial report. The PedQIs have since been completed, and have been incorporated into the first Model Report.

Added together, these three sets of indicators are very large. Evidence indicates that a report with dozens of individual indicators, not grouped together in any way, would not be user-friendly for the public and would not help individuals find the information of greatest interest to them. We therefore organized the first Model Report on the basis of *Health Topics*. We will call this first report, from this point on, the *Health Topics Model Report*.

By later in 2006, AHRQ and the AHRQ QI Team had completed work on a set of four composite measures using a substantial portion of the IQIs, the PSIs, and the new PedQIs. These composites were created on the basis of substantial statistical analysis as well as expert review (for more information, see the AHRQ website: www.qualityindicators.ahrq.gov/news/AHRQ_IQI_Composite_Draft.pdf and www.qualityindicators.ahrq.gov/news/AHRQ_PSI_Composite_Draft.pdf). There are two composites drawn from the IQIs, one composite drawn from indicators in the PSIs, and a final composite based on indicators in the PedQIs. AHRQ therefore asked the Baruch team to develop and test a second Model Report based on *composites*. We will call this second report, from this point on, the *Composite Model Report*.

The two Model Reports are complete in terms of their inclusion of all indicators relevant to particular health topics or included in the new composites. A sponsor will be free to choose which of the two Model Reports they will use as the basis for their own public reporting effort. We have not tested, and would not currently recommend, publishing a report that incorporates both health topics and composites. Such a report would be highly redundant, difficult to navigate, and most likely quite daunting to the public.

C. Key features common to both Model Reports

Form of dissemination:

The Model Reports assume that sponsors will use a website to disseminate hospital quality data. We assume the report will be a part of an existing sponsor website and that various aspects of the "look and feel" of the Model Report chosen by the sponsor will reflect that existing website. Though this is a web-based model, a very large proportion of the material in the Model Reports could be adapted to a print report, although this would limit the extent to which readers could select the particular kinds of data they see.

Language and literacy level:

The report is in English, and has been written so it can be read by most people. However, very low literacy individuals will likely not be able to read the report (although they may well be able to understand the graphics).

Language for the Sponsor's Website Home Page:

We have written language for the Home Page of the sponsor to introduce each Report on that Home Page and link users to the actual Report. Research consistently shows that public audiences are appropriately skeptical about health related information. Therefore, this initial language is key since it serves to legitimize the information in the report to public audiences. In our own research, for example, people stressed that they would not trust data that was collected and disseminated by individual hospitals. Major determinants of whether or not a report will be trusted include the sponsorship of a report and the sponsor's willingness to provide details about how data are collected and analyzed -- even though realistically very few members of the public (as compared to hospital staff and physicians) will ever look at those details.

An important feature of the sponsor home page is a suggested link to a mechanism for users to provide feedback on the Report to the sponsor. The Sponsor will need to decide how to structure this mechanism, but we believe it is a good idea to include an opportunity for feedback. Other approaches to evaluation of the report are also advisable, but this one is relatively low cost.

Language for the Report Home Page:

We have also written language for the initial home page of each report. This page introduces the report, provides a basic definition of quality, suggests ways to use the information in the report, and gives reasons why it is important to check on hospital quality. Finally, the home page describes briefly the kind of information available in the

report (this is customized for the two different kinds of reports) and provides a link to the selection of hospitals to compare.

There is always a tension between the desire to provide enough background to orient people to quality information and the desire to let people "get to the data" as soon as possible, which users find highly desirable. This is partially managed by letting people skip certain sections and go right to the section of the report that presents the data.

Hospital selection page:

In both reports, the first step of "getting to the data" is to select hospitals to compare. As noted in the template, this page and its related search functionality has to be created by the sponsor. The sponsor will decide whether the report will cover all of the hospitals in a single state, in part of a state, or across multiple states. In some cases, all hospitals will be included in a report; in other cases, where participation in public reporting is voluntary, not all hospitals will be included. The sponsor must select the hospitals to include and will have to write language to describe which facilities are included and which are not (and perhaps why).

Some things to keep in mind in constructing this page:

- People generally like to have access, somewhere on the site, to a list of all the hospitals included in the report, with location and contact information. Links to the websites of individual hospitals could also be provided and would likely be appreciated by members of the public.

- Creating an easy to use search function for hospitals is important. When there is a relatively small number of facilities included in a report (e.g. fewer than 15), the simplest and most effective approach is to have a list of all the hospitals in the report, with boxes people can check off if they want to see the data for that facility. It is essential that people be able to look at data either for a single hospital, or for a number of selected hospitals, or for all hospitals.

  When there are a larger number of facilities, the approach typically used is to narrow down the options geographically, using either counties or zip codes. More sophisticated systems are sometimes set up so people can choose hospitals within "n" miles of a given zip code. This approach sounds simple and easy but it turns out not to be, because hospital markets do not neatly coincide with either county or zip code boundaries. It may be valuable to develop a search function that allows people to look at more than one zip code or county.

  A final approach to this problem is to let people write in the name of a specific hospital in which they are interested. This works, but only if your search function is

not too exact. The names by which people know local hospitals are often not their exact formal name. If the search function requires the exact formal name, you will frustrate your audience. Explore the possibility of what is called a "fuzzy" search as an alternative. Remember that people are now used to dealing with very sophisticated search engines and will expect this kind of flexibility without even being aware of it. Note that having a complete list of the hospitals in the report can help since you can recommend that people use the name used in that list in their search.

- The hospital selection page ends with a link to the page for selecting the quality information you want to look at. Details on this page are specific to each Model Report and will be discussed later in this memo.

Material after the data:

Both reports have several pages of information **after** the data. The placement of this information after the data is purposeful and based on evidence of previous studies as well as on our own extensive cognitive testing. There is always a temptation to put a lot of this material up front, because it seems so important to us as health professionals. However, keep in mind that the public is looking for the data, and much of this additional materials does not make a lot of sense to them until after they have seen the data. People lose patience having to go through too many "up front" pages. Here are the specific elements included at the back of both the Model Reports.

- *How should you use this report?* This page makes suggestions about how to use the data, including but not limited to making a hospital choice and starting a conversation with one's physician. It also provides information about how people get admitted to hospitals.

- *A few things to keep in mind as you use the Report* This page gives some important caveats about the report and tips on how to interpret the information appropriately. It was probably the hardest page to write, since it deals with fairly sophisticated issues such as small numbers and risk-adjustment. We strongly advise you NOT to "tweak" the language here because small changes, in our experience, can lead to huge misinterpretations.

  This page also includes links to other kinds of hospital quality data as well as information about the services offered by specific hospitals. Our testing made it clear that the public does not see the AHRQ QIs as being comprehensive in terms of presenting all aspects of quality. Acknowledging this, and helping people find other data, is therefore critical. Sponsors may decide to incorporate other forms of data into their public report. If they do, this section will need to be modified.

Finally, this page includes a link to a section of the report on Technical Details about the Quality Information in the Report.

- *Hospital quality: What is it? Where can I learn more about it?* This page provides a fuller definition of quality using the six IOM domains. It also provides descriptions of and links to additional sources of quality information from CMS (Hospital Compare), AHRQ and JCAHO.

- *If you have concerns and complaints about your care:* This brief page tells people what to do if they have a complaint about the quality of medical care received in a hospital. The advice is to begin within the hospital itself, but we also suggest that if that doesn't lead to satisfaction, an individual can contact the State's QIO or its Survey Agency. Links to information on these agencies, as well as the Complaint Hotline at JCAHO, are also provided.

- *Technical details about the quality information in this Report:* This page includes information about how the data are collected and information on how the measures were developed, with links to detailed information about the AHRQ QIs from their website. A final section of this page must be completed by the sponsor: "how we analyzed the data and calculated scores."

  This section is designed primarily for health professionals rather than for the public, although our testing indicates that, with the exception of "all the acronyms" members of the public were able to deal with it. Previous research makes clear that even if people do not look at this kind of material, they want to know that it is there, because it indicates that the sponsor is willing to be "transparent" about their methods.

Sponsors are free to add links to additional resources on quality; we suggest some general resources, but sponsors can certainly add more. We also recommend that sponsors add links to educational resources that are specific to a particular health condition on pages where that condition is addressed. Many people in our tests became very interested in learning more about particular procedures or conditions, and it never hurts to take advantage of the "teachable moment."

D. Distinctive elements of the Health Topics Model Report

Organization by topic:

Given the large number of indicators to report, and the fact that the public does not resonate to terms such as Inpatient Quality Indicators, Patient Safety Indicators or even Pediatric Quality Indicators, we organized the indicators into ten (10) topic areas. Our own and others' research makes it clear that people often think about going to a hospital with respect to a particular disease condition and/or procedure that is immediately

relevant to them or a loved one, and thus want to look at hospital quality information organized in this fashion,.

Sponsors can select the topic areas they want to include. They can also choose not to include all the indicators we have placed within a specific topic. It would not be a good idea, however, to move an indicator from one topic to another.

The report has a page designed to let users choose the topics they will look at. This page has brief definitions of what is included in each topic. Users are able to look at only one topic at a time. They should be able to choose as many hospitals included in the report as they would like with respect to scores on a given topic.

Indicators included:

The Health Topics Model Report includes all indicators that are part of the current set of Inpatient Quality Indicators (IQIs), the Patient Safety Indicators (PSIs) and the Pediatric Quality Indicators (PedQIs). It does not include Prevention Quality Indicators, since these are not viewed as reflecting hospital quality. This does not mean that some sponsors will not want to report them, simply that since this is a report on comparative hospital quality, it made sense to focus on the IQIs, PSIs and PedQIs.

Four of the indicators included are not labeled as "quality indicators." These are the four utilization rates for Caesarean sections and Vaginal Birth After Caesareans (VBAC). After extensive discussion with AHRQ staff and the AHRQ QI team, we decided that since current evidence is not clear about the "right" utilization rate for these procedures, we cannot say whether a given rate is too high, too low, or just about right. We don't even know the general directionality people should look for. Therefore, there is a separate section of the report, in the childbirth topic, which includes these utilization rates, explaining that they are not quality indicators but rather information that may be of interest to some. Hospitals are not identified as doing "better" or "worse" on these indicators.

A similar issue arises with volume indicators included in the IQIs. Once again, there is not clear evidence of what the "correct" volume is for many procedures, so we cannot say what is a "better" or a "worse" score on a volume indicator. This being the case, we have structured the Health Topics Model Report so that volume indicators are on the same page as mortality indicators for a given procedure. The volume indicators are considered "additional information" rather than a quality indicator per se. This is explained with respect to each health topic where the issues arises.

Note that the inclusion of all indicators in the Health Topics Model Report does not imply that we expect or recommend that all sponsors include all indicators in their public reports. Indeed, we assume that sponsors will use their own judgment in selecting those

indicators that they feel are most important to share with the public in their area. In some cases, when slightly different indicators (i.e. indicators with slightly different denominators) are available, the sponsor would be well advised to choose only one, since providing multiple highly similar indicators will likely confuse the public.

The QI Team has already done work to place the indicators into "tiers" in terms of their validity, reliability and thus appropriateness for public reporting. The most recent information on these tiers can be found at the AHRQ website, http://www.qualityindicators.ahrq.gov. Over time, AHRQ expects to strengthen these indicators so that they become more appropriate for public reporting. They can be used as is, or sponsors can wait until they have been revised. In either case, the language for them is available now.

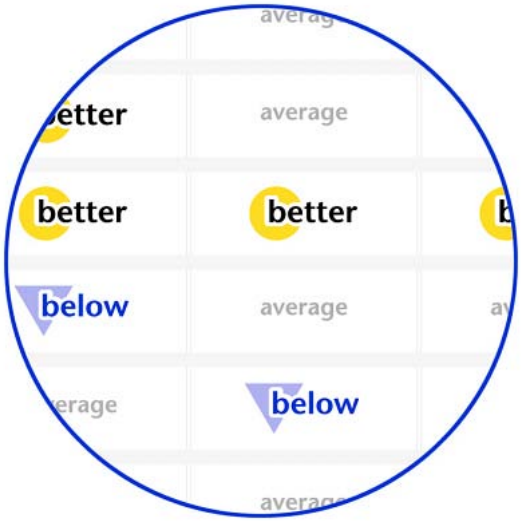
Selection of indicators within a topic:

The presentation of each health topic begins with a page on which people get brief definitions of each indicator within that topic. People can then pick the indicators they want to see by checking the corresponding boxes. Alternatively, they can also choose to select all indicators by clicking on the "select all" box. The volume indicators are not available to be "selected" and are placed at the bottom of the list under the header "additional information."

Comparison chart across indicators within a topic:

Once an individual selects the indicator(s) s/he wants to see and clicks on "compare hospital scores", they get to view the resulting comparison chart. We are assuming that sponsors have the ability to let users choose only certain indicators for inclusion in the comparison chart. Our test subjects strongly preferred a website with this function, so if sponsors have the technical capability, we strongly recommend they do this, rather than force users to look at all the indicators under a topic even if they are only interested in a small sub-set. This is particularly important for topics with a relatively larger number of indicators.

The comparison chart is based on a format extensively tested in recent laboratory studies conducted as part of the CAHPS II project by the American Institutes for Research and their collaborators, Dr. Judith Hibbard and Dr. Jeanne McGee. Their research demonstrated that this kind of presentation of comparative data, called a "word icon" presentation, is far superior to other approaches (such as star charts) that are commonly used to compare entities to each other or to an average. Specifically, people are much more likely to be able to identify high and low performers accurately and much more likely to use the information in making a decision (in the case of the lab studies, a hypothetical decision). The chart identifies hospitals as "Better than average" (bright green), "Worse than average" (bright blue) or "Average" (purposely faded grey).



If the sponsor has the technical capacity, they may also want to include additional symbols to visually indicate "better than average" and "worse than average" as seen to the left (for additional information, see the work of Dr. Jeanne McGee).

On the left side of the comparison chart, under the indicator name, we provide the average for each indicator. This information was included so that people can have a better understanding of just how "good" "average" was, and thus what it means when a hospital is "better" or "worse" than average. Participants in our cognitive testing responded very positively to this information. In addition, some of our testing respondents found it easier to understand what the rate was when it was written out in sentence form, such as "The average rate for hospitals across the state is **2** for every **1,000** patients." It also increased respondents' interest in the indicators because it allowed them to get a sense of what the actual data results were before looking at the bar graph for an individual indicator.

Individual indicator graphs:

The comparison chart is constructed so that people can select indicators to examine in detail. Making this selection takes the user to a horizontal bar graph which shows absolute scores for each of the hospitals selected, on a given indicator. The state average (or the regional or multi-state average if that is the breadth of hospitals included) is included as an anchor. This graphic design is fairly standard, but has some features that are special.

First, the graph is structured so that hospitals are ordered by performance rather than some other characteristics. This approach is, again, strongly evidence based. Such reports are considered more "evaluable" and appear to have a positive effect not only on public comprehension but on the level and intensity of quality improvement activities undertaken by facilities.

Second, we designed the bar graph to maximize comprehension of the bar showing the state (or other) average. In doing so, we built on parallel research for CMS on their

Hospital Compare website, in which we learned that many people are confused by the state and national average bars in their graphs. Our "fix" was: (1) to avoid using a different color for this bar, and instead use the same color in a pattern and (2) to provide specific language about why the state average is there and how to use it.

Third, we structured the graphs to ensure that the numbers were always whole integers (i.e. at least 1). Members of the public have great difficulty dealing with numbers like .35, and even more .035. This requires changing the denominator for the rate, so that in many cases it goes from 100 to 1000, or even 1,000,000. To ensure that people do not overestimate the numbers, we highlight situations in which events are extremely rare.

E. Distinctive elements of the Composites Model Report

Organization of indicators:

This report is built around the four composites developed by AHRQ, and the indicators included in those composites. Sponsors are free to choose which composites they will present. However, we do not recommend that they drop or change indicators within the composites, since they are based on extensive statistical testing and expert review.

Indicators included:

The indicators included in each composite were determined, again, through a process of statistical analysis and expert review. Some QIs are not included in any composites. Volume and utilization indicators are also excluded.

Selecting Overall Scores

Rather than selecting health topics, users of the Composites Model Report will begin by selecting what we are calling "overall scores." This term is used because the term "composite" would not be meaningful to members of the public. Four overall scores are available, one for each composite. Individuals can select as many overall scores as they want to see for the hospitals they have selected.

Overall Score Comparison Chart

Users are taken to a comparison chart for the overall scores they are chosen. This is the same kind of chart as the comparison chart described above for the Health Topics Model Report. However, since an "average" is not as meaningful for a composite score, they are not provided. The score is organized so the user can click on an individual overall score to get additional detailed results.

Overall Score Bar Graph

They next level of detail is a bar graph with the overall scores for a particular composite, for selected hospitals. This is the same information as the comparison chart, but in "absolute" rather than "relative" terms. Note that scores on composites are structured to reflect the observed v. the expected. Each graph has below it an important paragraph labeled "What do these scores mean" that presents this information in user friendly language. More technical information can be included in the back of the report in the discussion of scoring that the sponsor must develop.

Selection of specific topics (indicators) within an overall score (composite)

Users are shown the indicators that are included in each composite, and are given the opportunity to select those for which they would like to see scores. This is done in the same way as specific indicators are selected within a health topic, through a page on which user-friendly labels and definitions are presented.

Comparison charts and bar graphs for indicators within each composite

Once a user has selected the indicators of interest, the first presentation they see is a comparison chart like those described earlier. They can click on the name of each indicator to get to the next level of detail, which is a bar graph on each of the individual indicators. Again, this is the same kind of bar graph described above.

What Sponsors Have to Do

Sponsors will have to make many additional decisions and do additional development work to have an operational website. Specifically, they will need to:

- Select which of the two Model Reports they want to use as the basis for their report.
- Select which composites or health topics to include in the report.
- In the case of the health topics report, select which specific indicators to include in the report.
- Identify the hospitals whose data will be included in the report.
- Build the actual website or incorporate the report into an existing website.
- Program the site to enable both internal and external linkages.

- Create and test a "hospital search" function that permits users to choose one or more hospitals who scores they want to see, to limit their exposure to information which is, to them, extraneous.
- Create a set of "tabs" for the website to facilitate navigation (see page 2 of the composite template for an example). Ideally these tabs would be on the left hand side of the "page" but you might also want to look at the tabs used in Hospital Compare at the top of the page. We recommend in particular the following:
    - A tab on the Sponsor Home Page leading to the Report Home Page
    - The following tabs on the Report Home Page, and ideally visible wherever anyone is within the report website:
        - Compare Hospital Scores
        - What is Hospital Quality?
        - How should you use this report?
        - Things to Keep in Mind about Hospital Scores
        - Technical Details about Hospital Scores
        - Other Resources about Hospital Quality
- Make and implement decisions about the methods to be used in calculating the scores of individual hospitals, including whether "smoothing" or other statistical techniques will be used.
- Make decisions about methods and conventions to use in identifying statistically significant differences between scores.
- Develop language to be added to the website that describes these methodological decisions (the Model Reports include a place in the Technical Details page for such language to be inserted).
- If at all possible, conduct formal "usability" testing on their own adaptation of the Model Report, to make sure, in particular, that it is easy to navigate even for people who are not qualified for employment at Google.

Please consider these Model Reports as tools and resources. We expect and hope that sponsors will adapt it and improve upon it. We would welcome your feedback on your experiences working with it.