should be based on validated statistical mortality models. I strongly advise against the Council arbitrarily deciding on a single direction of abnormality for these laboratory values (i.e. collect only the highest white blood count) , as this approach would severely limit the accuracy of the risk-adjustment.

3. Collection of lab data directly by PHC4. The risk-adjustment capabilities of PHC4 data are of paramount importance in my research, and have led to several recent studies that help improve the quality of care in Pennsylvania hospitals.[3, 4] If PHC4 directly collects lab values from hospitals, they could then make this data directly available to researchers, further improving the quality of the risk-adjustment. As it stands, researchers can only use the summary risk score calculated by the third-party vendor. This score, while useful, is limited in that it only applies to in-hospital mortality. The presence of actual lab values would allow PHC4 and researchers to create customized risk-adjustment models for a wide variety of outcomes. Additionally, this approach would open up exciting new lines of research involving the laboratory values themselves. The marginal cost of collecting and storing these additional values would be minimal compared to the existing data collection and storage costs. Consequently, I urge the Council to directly collect laboratory values from hospitals and make these values available to researchers.

In summary, I urge the Council to collect both the highest and lowest laboratory values within the 24 hour admission period directly from the hospital, and make these values directly available to researchers. This strategy would both maximize the accuracy of the risk-adjustment and facilitate high-quality outcomes research leading to improved health care for the citizens of Pennsylvania. I believe the benefits of this approach outweigh the small marginal costs of collecting a few additional values. This approach also prevents the added costs of contracting with a third-party vendor.

If for some reason it is not possible to collect more than one value for each patient, I suggest that the Council develop an algorithm for determining the “most deranged” value (either highest or lowest) for reporting, based upon a validated statistical model.

Thank you for the opportunity to provide this comment, and please do not hesitate to contact me with any questions.

Sincerely,

Jeremy M. Kahn, MD MSc

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March 26, 2010

Joseph Martin
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Pennsylvania Health Care Cost Containment Council
225 Market Street, Suite 400
Harrisburg, PA 17101

Dear Sir:

I'm writing in response to the call for public comment on the collection of laboratory data by PHC4. I am a critical care physician and health services researcher at the University of Pennsylvania, specializing in the outcomes of patients admitted to the intensive care unit (ICU). My research interests include hospital benchmarking and the outcomes of severely ill hospitalized patients. My comments relate to the choice of laboratory values and the methods of data collection:

1. Use of "first" vs. "worst" laboratory values. The first laboratory value is unlikely to capture necessary detail about the patient's severity of illness. Important laboratory studies such as creatinine, BUN, potassium, troponin and white blood count frequently lag behind true physiological derangements, such that severely ill patients may initially present with normal values. Indeed, nearly all validated in-hospital clinical risk-adjustment schema, such as Acute Physiology and Chronic Health Evaluation (APACHE), Simplified Acute Physiology Score (SAPS) and Mortality Prediction Model (MPM) all use the "worst" value in the first 24 hours of admission, rather than the first.[1, 2] Consequently I urge the Council to collect the "worst" laboratory value during the proscribed admission period.

A recognized limitation of the worst value is that it can be influenced by treatment and therefore will measure both severity of illness on presentation and hospital quality. I feel that this problem is outweighed by the aforementioned benefits, such that overall quality of the risk-adjustment will be superior with the worst value.

2. Limitations of a single "worst" value for select laboratory studies. A major problem with collection only the worst value is that some laboratory studies are deranged in two directions—both low and high values are abnormal and associated with a higher risk of death. This situation is true for base deficit (#1), bicarbonate (#2), arterial pCO2 (#3), arterial pH (#4), calcium (#12), glucose (#16), potassium (#17), neutrophil band count (#27), and white blood count (#29). It is not easily apparent which value is worse: the lowest or the highest. Existing risk-adjustment schemes approach this problem by using statistical models to assign point-values to both the lowest and highest value, and then taking the value that assigns the most points. The Council can later develop risk-adjustment models that account for both abnormally low and abnormally high values. Consequently, I urge the Council to collect both the lowest and highest values of the aforementioned variables.

If only one value can be collected for each lab, I advise the Council to develop an algorithm that allows hospital to determine which value is worst in the case of both low and high derangements. This algorithm

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