Reviewer's report

Title: Effects of Ambient Air Pollution on Functional Status in Patients with Chronic Congestive Heart Failure: A Repeated-Measures Study.

Version: 1 Date: 26 June 2007

Reviewer: Stephanie von Klot

Reviewer's report:

General
This paper addresses the question whether the levels of a novel biomarker for heart failure (HF) severity (BNP, B-type natriuretic peptide) are associated with short term changes in ambient air pollution. This study is a retrospective analysis of a clinical study with a sample size of 28 patients with 3 repeated measurements. No association between pollutants and BNP levels was found. The authors argue that this may be due to the high within subject variation in comparison to the low expected effect size of air pollution. They conclude that BNP is not a suitable marker for the analysis of air pollution effects on HF.

1. Is the question posed by the authors new and well defined? Yes
2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work? Yes
3. Are the data sound and well controlled? Yes
4. Does the manuscript adhere to the relevant standards for reporting and data deposition? Yes
5. Are the discussion and conclusions well balanced and adequately supported by the data? Yes
6. Do the title and abstract accurately convey what has been found? Yes
7. Is the writing acceptable? Yes

Minor Essential Revisions
1. Table 2: It is not clear whether the it is the distribution over the study period or the distribution of the exposure assigned to the observations. The time period and location, as well as the number of observations should be presented.

Discretionary Revisions
1. Table 2: It may be helpful to also show how the air pollution concentrations varied within the individual. Since each subject was only observed over 3 months, air pollution contrasts may have been comparably low.
2. Discussion: The analyses controlled for weather, measurement occasion, and treatment group but not for potential individual confounders that may have changed over time and coincided with air pollution changes. Wouldn't it be possible that controlling for individual characteristics that changed over time may
have helped to explain the variation of the BNP measurements and thereby improved the estimation of the air pollution effect?

**What next?:** Accept after minor essential revisions

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.