

Reviewer's report

Title: Measuring the impact of waste management on health: the case of Campania.

Version: 1 **Date:** 10 February 2009

Reviewer: Stacy E Sneeringer

Reviewer's report:

Reviewer's Report

Title: Measuring the impact of waste management on health: the case of Campania

Version: 1 Date: 11 February 2009

Reviewer: Stacy Sneeringer

In this article the authors attempt to put an economic value on the morbidity and mortality reductions brought about by potential remediation of toxic waste sites. The authors perform a straightforward accounting procedure in which the number of avoided deaths and cases of cancer are multiplied by a dollar amount representing the value of life. This amount is then scaled to account for the fact that benefits from exposure reduction would not be realized until a later date. The value of this estimate may be pertinent to government agencies wishing to compare the costs of future land remediation with the potential benefits.

Overall I found the article interesting, educational, succinct, and relatively well-written. I appreciate the authors' attempt to write in a cross-disciplinary fashion, which can be a struggle when journals and colleagues are often strict adherents to disciplinary boundaries. While the paper does not make a particularly large contribution, I think that it is basically sound and would be useful in a local public policy arena.

Major Essential Revisions:

Comment 1: The authors state that they are using the "willingness-to-pay" (WTP) approach to assign dollar values. From an economist's perspective, I expected a completely different type of analysis based on this statement. What the authors do is not what economists would call a WTP approach. What the authors do assign monetary values according to the value of a statistical life (VSL).

A standard WTP study estimates the dollar value per unit of risk reduction. Thus, if someone were willing to pay \$1,000 to move from a state of having a .002 chance of getting cancer to a state of having a .001 change of getting cancer, we would say that their willingness to pay for a .001 reduction in cancer risk is \$1,000. The VSL is then a multiple of the WTP and results from moving from a state of zero risk to "full" risk (death with probability of one). In this example the

VSL would be \$1,000,000.

One could use someone else's estimate from a WTP study to assign monetary values per unit of risk reduction, but again this is not what the authors do. Rather, they apply a VSL to estimates of lives lost. Application of the WTP would involve multiplying the stated VSL (ie., 1.4 million Euros) by one minus the relative risk ratio, and then multiplying this by the entire population at risk. In the end this comment doesn't change the authors' findings. Certainly the VSL is derived from some WTP estimates, and the authors understand some of the challenges in appropriate use of WTP. I recommend that they change the language with regards to WTP.

Comment 2: The authors state that benefits would be realized after the latency period. However, during the latency period, we are left to assume that there are excess deaths due to toxic waste exposure. Because these deaths can conceivably not be avoided, in this schema they are valueless. Further, the lives that have already been lost are also not a "sunk cost", so to speak. How would one go about considering the lives already lost? In a sense, this raises the question of what the counterfactual is. Is the counterfactual a world in which there never were any toxic waste sites, so that no one would have died from them, so that the benefits of cleaning up the waste can be measured in the number of people who have already died from it? Or is the counterfactual a world in which the sites are cleaned up in the future, versus one where they are not? This has bearing on the question that the authors bring up concerning site remediation (where the site has already led to increased mortality) versus avoiding new dumping sites (where avoiding new sites saves lives). It might be beneficial to extend the analysis by estimating the past cost of lives lost, taking into consideration when the sites were created and estimating the number of lives already lost (with the accordant dollar amount).

Comment 3: The authors conclude that there is a strong economic argument for site reclamation. However, this would only be the case if the benefits were larger than the cost. Now that the authors have a sense of the benefits, the authors could provide some sense of cost. What have other, similar projects cost? I would not expect the authors to provide an engineering study, but some estimates that provide an order of magnitude of the costs would strengthen their argument that there are economic incentives to waste disposal site remediation.

Minor Essential Revisions:

Comment 4: From the beginning of the article the authors need to make clear the type of "waste" to which they are referring. There are many types of waste (livestock waste being an example) that would be considered differently in terms of management and health effects.

Comment 5: The final amount of benefits to be gained from land reclamation is based on having the correct estimate of the relative risk. While the authors state several of their assumptions, one they forget is the assumption that the relative risks are correct and not overstated due to some unobserved confounding.

Without knowing how the original study was done and without expecting the authors to re-write the full results of the prior study, I recommend stating this as an assumption. Additionally, the authors assume that the VSL used is accurate.

Comment 6: It would be beneficial to a reader's understanding if the column headings in the table make explicit that the observed cases and the PAP are for an eight-year period. Either do that or show two rows for the number of total cases: one for the eight-year period and one for the cases per year.

Comment 7: If a policy-maker is considering funding a project to clean up the toxic waste sites, should s/he consider paying up to €9.400 million, the stated benefits from avoiding premature deaths, or up to €16.100 million, which is the cost of both the cancer and the mortality. Are the fatal causes of cancer subsumed in the mortality? If so, why present both estimates? Would a policy maker only want to avoid fatal cancers, not the other causes of death associated with the toxic waste sites?

Comment 8: The abstract states that the benefits total "€9.400 million" (in the case of premature death), but Table 3 suggests that the benefits total €9,400 million, which is equivalent to €9.4 billion. By my calculations, €9.4 billion is correct. If that is the case, why are the authors phrasing estimates as €9,400 million, rather than €9.4 billion?

Comment 9: The title is misleading. The article does not measure the impact of waste management on health. To do this would require health impact estimates before and after remediation. It estimates the potential economic benefits in terms of health of remediation.

Comment 10: The idea of what the authors mean by a latency period is not well-explained (p.7). The authors bring up cancer cases, so I began to think the latency period was the time between exposure and development of the disease. A different word (other than "latency") would help clarify the point.

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

Declaration of competing interests:

I declare that I have no competing interests.