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AIR POLLUTION

VIEWPOINT PAPER

Benefits and Costs of the Air Pollution Targets for the Post-2015 Development Agenda

Clean Air Asia

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Post-2015 Consensus

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INTRODUCTION

Although one of the seven Millennium Development Goals is to "ensure environmental sustainability," there are no explicit goals on pollutant concentration reduction. Larsen's paper is commendable, providing data to support the inclusion of improving air quality, specifically $PM_{2.5}$ reduction, to the post-2015 development agenda. It proposes the use of WHO Air Quality Guidelines as the final global target which has not yet been adopted as a guideline in existing international agreements regarding air quality. The higher benefit-cost ratios calculated for measures addressing indoor air pollution compared to those computed for several selected measures mitigating ambient air pollution suggest that it may be more economically efficient to focus on indoor air. However, it may be noted that the study assessed only a limited set of measures for abating ambient air pollution. It is worthwhile to look at other options (e.g. transportation-related control measures) which may yield lower benefit-cost ratios or even negative costs, particularly if effects other than health impacts such as fuel and time savings are valuated. Moreover a simple cost-benefit analysis may not present a holistic picture. It is suggested that for decision-makers to be well-informed in prioritizing policies or measures, more information such as 'do-nothing' versus 'intervention' scenarios and co-benefits (e.g. climate change mitigation, agricultural effects) are factored in. In terms of communicating the results of the cost-benefit analysis, it is suggested that the message be clarified so developing countries are encouraged to consider abatement options for both ambient and indoor air pollution as they progress, instead of choosing only one. As the paper shows that ambient and indoor air pollution are interrelated, maximum health impacts can then be achieved by addressing both.

AP FOR INCLUSION IN POST-2015 DEVELOPMENT AGENDA

Citing air pollution as the cause of 7M deaths worldwide in 2012, Larsen argues that it is a critical health and environmental issue to be considered as the Millennium Development Goals are coming to a close in 2015. This has been recognized by WHO Director-General Margaret Chan as well. At the 67th World Health Assembly held in May 2014, the Director-General included air pollution as one of the major health challenges that need to be part of the post-2015 agenda, alongside the renewed spread of polio virus and increasing incidence of obesity.[1]

USE OF WHO AQG AS GLOBAL TARGETS

In setting targets, Larsen is proposing the use of WHO Interim Values for $PM_{2.5}$ and then working towards the WHO Air Quality Guideline of 10 $\mu g/m^3$. Other international agreements on atmospheric issues impose percentage emission reduction (Kyoto and Gothenburg Protocols) or national emission ceilings (EU directives).Larsen is advocating for more stringent standards, stating that "moderate improvements in $PM_{2.5}$ air quality will only give quite small health benefits," owing to the highly non-linear exposure-response relationship for $PM_{2.5}$based on ambient concentrations in low to middle-income Asian cities. Though this is the first time that the WHO Air Quality Guideline has been recommended to be set as a global target (given that one-third of the world does not even

[1]http://unfccc.int/kyoto_protocol/doha_amendment/items/7362.php, Accessed 28 January 2015.

meet WHO's Level 1 Interim Target of 35 μg/m^3 [2]), it is sensible that it is established as our long-term goal as the concentration of 10 μg/m^3 represents the lower end of the range over which significant effects on survival were observed in the American Cancer Society's (ACS) study.[3]

SUGGESTIONS FOR IMPROVING COST-BENEFIT ANALYSIS

To fortify the case for improving air quality as part of the global agenda, a cost-benefit analysis was conducted by Larsen. This paper presents several comments on Larsen's analysis.

Firstly, it may useful for a cost-benefit analysis to look at the opportunity cost (on health effects) if no interventions to improve air quality are made. In the paper, benefit-cost ratios were computed using data obtained from the base year of 2012. However, the dynamism of the impacts, particularly in the long-term, should have been discussed given that it was not possible to do such an analysis during the study period. Thus, interventions to improve air quality (assuming they were carried out during the base year), may have compounding effects and may possibly lead to greater health benefits than shown in the paper. Given this situation, it may also have been useful to perform forecasting and show projections for 'do-nothing' versus 'intervention' scenarios.

Secondly, in order to provide a more accurate analysis, co-benefits need to be factored in the equation. The term 'co-benefits' has been defined in a number of ways including "benefits that accrue as a side effect of a targeted policy.[4]" For example, reducing sulfur in diesel fuel would lead not only to reducing particulate matter emissions but also ambient sulfur dioxide (SO_2). SO_2 is another criteria pollutant and high concentrations of this compound are linked to respiratory illness, alterations in pulmonary defences, and aggravation of existing cardiovascular disease.[5] SO_2 as a precursor to sulphates is also associated with acidification of lakes and streams, accelerated corrosion of buildings and monuments and reduced visibility[6]. The reduction of the negative effects of SO_2 has not been captured into the cost-benefit analysis for lowering sulfur content of fuel.

CONCLUSION

A more accurate cost-benefit analysis would include a consideration of co-benefits with respect to climate change mitigation, black carbon reduction and other development aspects to provide a more complete picture for decision-makers. It was observed in Larsen's paper that non-health benefits were discussed for mitigating indoor air pollution but not for ambient air pollution. Extending the discussion of non-health benefits and the previously mentioned co-benefits for reducing ambient air pollution may further enrich the analysis, or at least it should have been discussed that the other measures for reducing

[2]Brauer M., et al. 2012. Exposure assessment for estimation of the global burden of disease attributable to outdoor air pollution. Environ SciTechnol, 46(2):652L60.
[3]http://whqlibdoc.who.int/hq/2006/WHO_SDE_PHE_OEH_06.02_eng.pdf?ua=1. Accessed 28 January 2015.
[4]Pearce, D. (2000). Policy Frameworks for the Ancillary Benefits of Climate Change Policies. CSERGE Working Paper GEC 2000-1. http://www.uea.ac.uk/env/cserge/pub/wp/gec. p. 1.
[5]http://www.epa.gov/airtrends/aqtrnd95/so2.html. Accessed 28 January 2015.
[6]Ibid

ambient air pollution would have significant co-benefits that can be monetized in subsequent analyses. Likewise, the benefits of improving indoor air pollution based on health effects can be merged to include mortality and morbidity data for indoor air pollution in isolation and indoor air pollution as a contributing factor to ambient air pollution. In Larsen's paper, separate cost-benefit ratios were generated for improving household cooking under indoor air pollution and ambient air pollution.

It is recognized that Larsen's paper or any single paper may not be able to fully cover all costs and corresponding benefits associated with reducing $PM_{2.5}$ levels. The points discussed above are put forward for consideration during subsequent cost-benefit analyses which would build upon works such as Larsen's.

This paper was written by Maria Katherina Patdu, Alvin Mejia, Preciosa Benjamin and Glynda Bathan-Baterina on behalf of Clean Air Asia. The project brings together more than 60 teams of economists with NGOs, international agencies and businesses to identify the goals with the greatest benefit-to-cost ratio for the next set of UN development goals.

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