BOLD THINKERS DRIVING REAL-WORLD IMPACT

ABT WHITE PAPER

A Win/Win: Driving Improved Climate and Health Outcomes Through Mainstreaming of Co-benefits Quantification

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As climate change continues largely unabated, health and climate experts are increasingly concerned over its impacts on human health, which are exacerbated through a range of pathways. According to an Intergovernmental Panel on Climate Change (IPCC) report, diseases that are climate-sensitive were estimated to be responsible for around 39.5 million deaths (almost 70 percent of the total number of deaths) in 2019[1]. As the climate crisis worsens, existing public health vulnerabilities—including food insecurity, access to safe water, sanitation, healthcare, and education—will be exacerbated, and vulnerable populations such as children, the elderly, socioeconomically marginalized communities, people with disabilities, and indigenous peoples will experience disproportionate exposures and vulnerabilities to climate-related hazards. The impacts on women and girls are particularly notable, including increased risks of adverse pregnancy outcomes, malnutrition, and gender-based violence.

These concerns have spurred a commitment by the global health sector to advance mitigation and adaptation efforts, as recently reinforced at COP27[2], however, we need accurate data so we can calibrate efforts and monitor progress. Luckily, the health impacts of climate change can be quantified, although with various degrees of uncertainty, and can be used to justify and rally support for near-term investments by illustrating mid- to long-term benefits to public health. The IPCC estimates, for example, that the net global benefits of climate action to public health that would result in avoided hospitalizations, morbidity, and premature deaths exceed the costs of mitigation efforts.[3] While the broad implications of climate change on health are well documented, policy makers and the private sector lack the data they need to develop cost-effective, actionable ways to invest, and to communicate the complete financial and economic impact of a given deliberate strategy or investment. Decision support tools such as cost-benefit analysis (CBA) play a crucial role in helping policy makers evaluate the net benefits of proposed actions. Co-benefits analysis, or the estimation of benefits resulting from an action that are not related to its primary purpose and can help ensure that key benefits of climate mitigation measures are considered.

Health policymakers and stakeholders can use information generated from CBAs, co-benefits analysis, and general economic analysis to make informed, evidence-based decisions that not only demonstrate the cost-effectiveness of climate interventions but also highlight the multitude of benefits to public health. These benefits can be direct—as in the improvement of localized air quality—or can occur downstream, such as through the decreased spread of infectious diseases that were exacerbated due to climate risks, or through improved nutrition resulting from larger crops with greater micronutrient content (e.g., iron and zinc[4]). Quantifying the public health benefits of climate action can also help contribute to climate and environmental justice by highlighting—and then addressing—inequities within disadvantaged communities that often experience disproportionate harm from climate change impacts.

Challenges and Opportunities

CBA and co-benefit analysis are critical tools for informing decisionmakers, but that doesn't mean they don't have their challenges in their application to climate actions. One challenge is the need to account for the sheer variability of the risks that extreme weather, temperature, and climate change pose to public health. As atmospheric concentrations of greenhouse gases continue to rise, average global surface temperatures increase, which impacts climate exposures, hazards, and vulnerabilities that result in climate risks such as floods, extreme heat, droughts, heavy rainfall, and extreme storms. All of these climate risks impact human health through exposure pathways that are direct (such as through physical injury and deaths) or indirect (through climate sensitive infectious disease, poor nutrition due to impacts to food supplies, and forced migration, to name a few).

To one degree or another, these exposure pathways will affect the future state of the world, which means they'll impact the potential effectiveness and sequencing of mitigation and adaptation actions. Uncertainties around future states can be addressed by modeling a range of scenarios and their financial and economic outcomes, such as possible atmospheric concentrations of greenhouse gases or land use. When coupled with sensitivity analyses, which model the relative influence of various assumptions, scenario modeling makes it possible to evaluate uncertainty on multiple levels.

The lengthy time horizons needed to evaluate the impacts of mitigation or adaption efforts also present challenges for researchers and decisionmakers. CBAs and co-benefits analyses should encompass a time horizon that extends over the lifetime of the activity and that is long enough to capture the resulting costs, benefits, and co-benefits; that may be 50 years or more. Due to these lengthy time periods, the effects of discounting and compounding interest—which are used to quantify costs and benefits that would occur in the future—have a substantial effect on CBA and co-benefits analyses results. For example, large benefits or costs that occur several years in the future have a present value of close to zero, even when using a low discount rate, underscoring the importance of appropriate discount rate selection when evaluating climate impacts.[5]

Another challenge relates to gaps in the data needed to quantify and monetize health outcomes, particularly in low-data contexts where the data needed for quantification and monetization may not exist. Quantification of health outcomes is crucial for developing baseline or status quo scenarios, and for estimating the impacts of proposed actions on different health outcomes. Health data must not only be available in a digitized format but must also be consistent in type and quality in order to standardize approaches and subsequent results. The monetization of these quantified impacts is then a critical step in the ability to estimate benefits. While estimating the costs of proposed actions is often straightforward in terms of expenditures of labor and capital, estimating benefits is often a much more challenging endeavor.

The direct benefits of health outcomes are derived from the avoidance of—or reduction in—mortality and morbidity, while indirect benefits result from environmental improvements that impact health and security, such as strengthened food systems, more resilient natural landscapes, and reductions in climate-related disasters. The value of a statistical life is a commonly used measure to quantify the benefits of avoided mortality, but the valuation of morbidity benefits often must rely on medical treatment costs, which do not account for either the full monetary or non-monetary costs of illness, such as lost productivity or losses associated with the pain and suffering endured by individuals and families.

A key component of CBA and co-benefits analyses is determining the appropriate analytical scale for the participating stakeholders. Analyses can be conducted on a local scale if an action would affect a small geographic area and a limited set of stakeholders. Analyses of climate change, however, often ask for and necessitate differing analytical scales, as the impacts of climate change—and thus the benefits resulting from avoiding or mitigating these damages—may have impacts at a national, regional, or global level.

CBA and co-benefits analysis can be hugely informative but they're also highly dependent on a series of critical modeling assumptions. Abt experts understand these challenges, and have extensive experience helping clients at the local, regional, national, and international scale not only collect the data but use the subsequent analysis to arrive at an informed decision.

Case Studies

A recognized leader in economic, policy, and climate analysis, Abt Associates has conducted CBA and co-benefits analyses aligning climate and health priorities at various scales—including the local level—to evaluate the efficiency and effectiveness of mitigation strategies. Under the USAID-funded Climate Economic Analysis for Development, Investment, and Resilience Activity (CEADIR), Abt prepared CBAs on household cooking fuel production and use, evaluating charcoal fuel sources in Lusaka, Zambia, and wood fuel sources in Lilongwe, Malawi.

Both fuel sources are commonly used for cooking, but they create high levels of household air pollution. We documented the clear health co-benefits associated with reduced exposure to fine particulate matter (PM2.5), such as short-term health outcomes and reductions in mortality and morbidity risks. We used a 50-year time horizon to capture the long-term costs of health risks of PM2.5 and broader social costs of greenhouse gas emissions. The research highlights the long-term, public cost-effectiveness of switching to cleaner combustion technologies—including electric hotplates to reduce the economic costs of GHG emissions—and the resulting positive health impacts from reductions of PM2.5 exposure[6,7]. We've also conducted similar evaluations of the health co-benefits of proposed emissions legislation domestically at both the state and city level for New York[8].

Another example is an intervention analysis by Abt that captured benefits at national and sub-national scales. In the Philippines, Abt conducted an economy-wide CBA of climate mitigation options and a detailed health analysis under the USAID Building Low Emission Alternatives to Develop Economic Resilience and Sustainability (B-LEADERS) project. [9] The analysis covered the six priority sectors of the Philippines National Framework Strategy for Climate Change: Agriculture, Energy, Forestry, Industry, Transportation, and Waste. Although not specifically conducted for the health sector, estimates of improved public health as well as benefits to energy security, gender, and employment were key aspects of the analysis.

The evidence generated was used to inform policymaking in the Philippines and served as a critical data source for target-setting in the Philippines' first Nationally Determined Contribution. The analysis considered non-market co-benefits, such as the value of air quality-related improvements in public health and savings resulting from reduced traffic congestion and improved travel times. The co-benefits for health included monetized public health benefits, reflecting the reduced risk of premature death from exposure to air pollution.

CBAs and co-benefits analyses can also provide information on the impacts of climate mitigation measures on a global scale, such as methane emissions reduction. The global warming potential of methane is roughly 80 times that of carbon dioxide over a 20-year period,[10] and methane has contributed to nearly half of global warming experienced to-date. [11] Given the health and environmental impacts associated with methane emissions, methane mitigation strategies are some of the most effective options available for addressing the adverse health and environmental impacts of climate change.

Expanding the focus of CBAs and co-benefits analyses to methane would help develop national implementation roadmaps that are consistent with Global Methane Pledge commitments. For example, Abt recently analyzed 16 methane abatement solutions in the energy, agriculture, and waste sectors and found that these 16 technologies have the potential to reduce 20 percent of annual methane emissions by 2050 (based on a 2017 baseline). Our findings suggest that the social benefit of reducing 1 ton of methane is more than 60 times that of reducing 1 ton of CO2 by integrating wind and solar power into the grid. [12] This data can be useful to health decisionmakers, and it also can help catalyze climate financing investments for health-specific adaptation and mitigation actions.

Conclusion

The three case studies demonstrate how CBA and co-benefits analysis can be used to illustrate achievable health benefits, provide an economic case for incorporating health co-benefits in climate policies, and encourage more coordinated and ambitious multi-sectoral action. These flexible tools can be used in relatively low-data contexts using information that ministries and statistical agencies already collect.

As such, they are readily available to strengthen the capacity of local, private, and governmental actors to collaborate within and across sectors and make informed decisions on climate actions.

CBAs and co-benefit analyses can also equip decisionmakers to fortify policy objectives by communicating within government and to communities about the benefits of climate actions for the local economy and for health and wellbeing.

Additionally, they can help make the case for health-related climate financing and encourage investment in related objectives.

The impacts of climate change on health are here and are worsening; by conducting—and mainstreaming—CBAs and co-benefits analyses, decisionmakers in and outside of the health sector will be better equipped to take necessary action against climate change impacts while also improving public health.

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