Distributional cost-effectiveness analysis in low- and middle-income countries: a case study of Rotavirus vaccination in Ethiopia

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Abstract: Reducing health inequality is a major policy concern for low- and middle-income countries (LMICs) on the path to universal health coverage. However, health inequality impacts are rarely quantified in cost-effectiveness analyses of health programmes. Distributional cost-effectiveness analysis (DCEA) is a method developed to analyse the expected social distributions of costs and health benefits, and the potential trade-offs that may exist between maximising total health and reducing health inequality. This study shows how DCEA can be applied in LMICs using the introduction of rotavirus vaccination in Ethiopia as an illustrative example. We analyse a hypothetical re-designed vaccination programme which invests additional resources into vaccine delivery in rural areas, and compare this with the standard programme currently implemented in Ethiopia. We show that although the re-designed programme is potentially cost-ineffective when compared with current estimates of opportunity cost in Ethiopia, it may also be considered more equitable. We analyse the trade-off between cost-effectiveness and equity using the Atkinson inequality aversion parameter, $\varepsilon$, representing the decision maker’s strength of concern for reducing health inequality. We find that the more equitable programme would be considered worthwhile by a decision maker whose inequality concern is greater than $\varepsilon = 5.66$, which at current levels of health inequality in Ethiopia implies that health gains are weighted at least 3.86 times more highly in the poorest compared with the richest quintile group.