**Secondary hospital efficiency analysis in Ethiopia: Technical and scale efficiency applying data envelopment analysis method**

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**Background**: Ethiopia has able to effectively achieve better health gains for the population with a broader vision of seeing health, productive and prosperous citizens. Understanding its relevance efficiency, effectiveness and evidence based decision making are taking the priority objective in the five year strategic objectives of the health sector (FMOH, 2015). The efficiency analysis would be expected to be enhanced across different health tiers: primary, secondary and tertiary level.

**Objective**: This efficiency analysis aims to generate technical and scale efficiency of secondary level hospitals in Ethiopia and assess the possible inputs saving for these inefficiencies.

**Methods**: The costing study was retrospective, facility-based and employed cost accounting techniques to identify and measure the costs incurred in delivery health services at the facility-level. A nationally representative sample of 12 hospitals at the secondary care level was included for the costing analysis. The efficiency analysis computed to the relationship of hospital inputs (human resources, drugs and medical supplies, depreciated equipment and indirect cost at the 2017 costing base year) and outputs measured in the outpatient equivalent visits. Data envelopment analysis (DEA) non-parameter technique was applied to analysis total hospital efficiency and department-level efficiency.

**Findings:** Human resources and medical supplies accounts for more than 50% of the cost across the surveyed secondary hospitals. Of the twelve surveyed secondary hospitals, two hospitals (Bishoftu and Kemise) were technically efficient while the remaining ten hospitals were technically inefficient in 2016/17. The overall average technical efficiency score among the inefficient hospitals is 66%. On average the secondary hospitals could reduce their inputs by 34% without reducing the current output level. Through reducing the inputs, there is a potential to save a total of 192.5 million birr (without any reduction in outputs). The average scale efficiency score among inefficient hospitals is 15%, inferring a potential to increase total outputs by 85% within the existing capacity and size.

**Conclusions:** The majority of secondary hospitals were inefficient and a significant amount of inputs resources could be potentially reduced. There exist a huge potential to increase outputs (almost by 85%) with the current existing capacity and size. But this probably depends on other factors such as: increasing service acceptability, quality and awareness creation.