

**Technical efficiency and total factor productivity growth in
Uganda's district referral hospitals
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The study measures the technical efficiency and total factor productivity growth of 25 district referral hospitals from three regions of Uganda over the 1999-2003 period. This study is motivated by a desire to evaluate the ongoing health sector reforms in Uganda which in part are seeking to improve the efficiency of health services. Nonparametric Data Envelopment Analysis (DEA) is used in the measurement of hospital technical efficiency whilst the DEA-Malmquist index is used in the measurement of hospital total factor productivity change. The Hospital Management Information System launched in 1997 is the source of the data for this study. The results indicate the existence of different degrees of technical and scale inefficiency in Uganda's district referral hospitals over the sample period. There were productivity losses for the sample hospitals which are largely due to technological regress rather than technical inefficiency. Thus, changes in technology are needed if the hospitals are to become more productive, for instance through improved diagnosis tests, hospital information management. The findings illustrate one of the advantages of the frontier efficiency technique, namely the ability to identify the degree of emphasis that should be placed on improving technical efficiency vis-a-vis technological change. The study adds to the existing literature on health facility efficiency but additionally incorporates patient deaths in the measurement of hospital technical efficiency. Additionally, heterogeneity in the patient load is controlled for via a length of stay-based case-mix index. Quality of care was incorporated into the analysis by means of patient deaths. Super-efficiency was conducted to further distinguish between the technically efficient hospitals. To construct confidence intervals for individual hospitals technical efficiency scores, nonparametric bootstrapping was conducted. The efficiency vectors yielded have ready uses by policymakers in the hospital sector. Indicators of the relative efficiency of hospitals are needed to gauge whether hospital cost-containment efforts are succeeding, amongst other uses.