Evaluating the Productivity of Faith based Hospitals in Tanzania: Application of Malmquist Productivity Index (MPI) Approach

Kembo M. Bwana¹

Abstract
In this study we estimate the productivity of Not For Profit (NFP) hospitals in Tanzania over sampled period from 2001/2002 - 2011/2012, of which most of them belongs to faith based organisations. Faith based organisations in Tanzania are categorized into Volunteering Agency Hospitals (VAHs) and Councils Designated Hospitals (CDHs) our focus in this paper premised on Volunteering Agency Hospitals (VAHs). We employ a DEA based Malmquist Productivity Index (MPI) in the data set of 15 faith based hospitals. Objective of this study is to determine the total factor productivity (TFP) and its components over the period under the study as well as establishing the sources of productivity change. Contribution of our study stems in the following ways: firstly, examine the productivity change of the hospitals under the study and hence be able to provide generalization about the productivity of faith based hospitals in Tanzania (particularly volunteering agency hospitals), this will give hospitals’ administrators, owners and policy makers a clear picture with regards to productivity performance. Secondly, the study will contribute to the existing literatures on hospital productivity (particularly faith based hospitals in developing countries such as Tanzania). The results of our study revealed that the Volunteering Agency Hospitals (VAH) in Tanzania experienced 1.6 per cent deterioration rate per year during the period under the study (2001/2002 – 2011/2012). This deterioration of 1.6 per cent per year is largely due to a decline (worsening) in technical progress (2.6 per cent per year) which counterbalanced the improvement in technical efficiency change which is very small (1 per cent per year).

Keywords: Productivity, Faith based Hospitals, Malmquist Productivity Index (MPI), Tanzania

1. Introduction
Total factor productivity (TFP) change is the measurement of the changes in outputs controlling for the inputs used, and it can be divided into different components. By comparing the annual changes in the productivity of individual hospitals it is possible to identify general trends in the productivity of the hospitals industry as whole and helps in identifying individual hospital exhibiting pattern of changes in the productivity that differ from the rest of the industry.

The focus of our study is to measure productivity change in the hospitals (particularly faith based) sector in Tanzanian. Taking its components into consideration that is efficiency change (assessing whether the hospitals is becoming closer to the production frontier or not) and technological change (whether there is a shift in production frontier or not). We employ DEA-based Malmquist Productivity Index (MPI) as the estimating technique. Several studies have employed the use of MPI to measure the efficiency and technological changes in hospitals sector.

The concept was originally advocated by Sten Malmquist (Malmquist, 1953) who used it in the analysis of consumer theory. It was later advanced for the use in productivity measures in the work of Caves et al (1982) followed by its application in many other studies. The major attributes of MPI in productivity analysis

¹Accounting School, Dongbei University of Finance and Economics, No. 217, Jianshang Street, Dalian, China, Lecturer, Department of Accounting, College of Business Education, Tanzania
is that it can handle \textit{multi-outputs, multi-inputs} set up even in the presence of only quantity information (in other words it doesn’t need the relative price information or the restrictive behavior assumptions in its formation.

Building on argument of Fare et al (1994) the MPI application allows for the estimation of changes in overall productivity and then for decomposition into efficiency changes (ECH) and technological change (TCH) for each decision making unit (DMUs) over time. In order to estimate the MPI and its components we employ a non parametric estimator known as DEA. Given its attributes (ie it doesn’t requires the neither imposing functional for technology nor distributional assumptions about variables or error terms), DEA is widely used to estimates the MPI and technical efficiency in an environment with multiples inputs and outputs (Emrouznejad, et al 2008; Gattoufi et al, 2004b; Gattoufi et al, 2004c; Seiford, 1997) and in particular in health sector ( Grosskopf et al, 2004; Hollingsworth, 2003; Ozcan, 1995; Wang et al, 1999; Ferrier and Valdamanis, 2008)

\textbf{Objectives of the Study}

General objective of this study is to examine the factor productivity of volunteering Agency hospitals (VAHs) in Tanzania. Specifically the assessment includes:

i. Determine the total factor productivity change and its components in volunteering Agency hospitals (VAHs) hospitals in Tanzania

ii. To establish the sources of total factor productivity change of volunteering Agency hospitals (VAHs) in Tanzania

\textbf{Significance of the Study}

Management of any organization always considers the effectiveness, productivity and efficiency as the sound performance indicators which in most cases indicate the realization of the management objectives and goal of the firm (Pharm, 2010). In the same line of argument performance of any sector/industry depends upon the efficacy, efficiency and productivity of individual units/firms in the sector over a period of time.

The need for quality health care in Tanzania (like in any other country) is large and increasing over time while the government has inadequate resources to finance the rising demand therefore private hospitals (particularly faith based) are playing a very important role to cover the gap. Although there are existence of extensive literatures on efficiency and productivity in health care provision, a few empirical analysis on productivity of faith based private (not for profit) hospitals in developing countries particularly in Tanzania have been conducted.

This study therefore aims at measuring productivity change of the private hospitals (not for profit) for the period of eleven years. One of novelties of our study is that we use the data set of 15 faith based (Private Not for Profit) hospitals to analyze the productivity change over the period of ten years (2001/2002 – 2011/2012). By employing the DEA based Malmquist Productivity Index (MPI). Most of literatures on hospitals productivity focus on the public hospitals, and for short period in which it is difficult to thoroughly assess the change of productivity and its components.

Different systematic reviews of literatures on hospitals efficiency and productivity have been conducted by Hollingsworth et al (1999), Hollingsworth (2003) and Worthington (2004). However, most of the literatures reviewed were emanating from the hospitals in developed countries. This study again is expected to contribute on the few literatures on the hospitals productivity in developing countries (particularly Tanzania).

The outcome of the study can help the decision makers, policy makers and hospitals administrators to understand what actually derive the productivity change of faith based hospitals and helps in resources allocation process. The policy makers may also use the information from this study to revisit policies on healthcare delivery to ensure improvement in the health sector.
The rest of this paper is as follows; Section two gives the review of existing literatures on the current study. Methodology (that is data set descriptions, estimation techniques and model as well as variables selection are presented in section three. Section four provides the estimation results, discussion of the findings and its implications. Section five gives concluding remarks and recommendations.

2. Literature Review

There has been substantial coverage of literatures on evaluating the performance hospitals and health care sector particularly in developed countries. However, literatures on hospitals productivity is still lagging behind in developing countries. Several studies which have been conducted on hospitals productivity in both developed and developing countries have employed the Malmquist Productivity Index (MPI). The approach has been widely used in measuring the efficiency and technological change, change in pure technical efficiency and change in scale efficiency as well as total productivity change of hospitals services.

Literatures record that using an input based MPI, Pharm (2010) studied changes in productivity of hospitals in Vietnam between 1998 and 2006 with data from 101 hospitals; and the author found that hospitals productivity progressed around 1.4 percent per year which was mainly due to the technical efficiency improvement. Furthermore, the author found that provincial hospitals were more technical efficient than their counter hospitals, and hospitals located in different regions performed differently. Using Malmquist Productivity Index (MPI) Zere (2008) studied the hospital efficiency and productivity in South Africa using data which covers 1992/1993 – 1997/1998, the author found that over the sample period total factor productivity dropped by 12.1 percent, this was largely due to decline in the technical progress over the years 1992/1993– 1997/1998. Technical efficiency dropped by the average of 2.1 percent as opposed to a 16.5 decrease in technological growth. The efficiency change and technological change were observed to move in opposite direction.

Sahin et al (2009) found that technological progress was the main driver of the improvement in productivity in 2007 due to ministry of health (MoH) investments in general hospitals in Turkey, but rather there was a decline in technological progress in the subsequent years which left overall productivity unchanged. In the study conducted by Maniadakis et al (1999) the author found that productivity changes are dominated by technological changes with a little change in hospital efficiency.

Fare et al (1994a) investigated 17 Swedish hospitals and found a wide variation in performance during the period of 1970-1985. They found that long term average annual productivity growth was negative for about 13 out of 17 hospitals. Authors concluded that 13 out of 17 hospitals were experiencing technological regress and only five out of 17 experience average annual gains in efficiency. Ozcan and Ozgen (2008) conducted similar study and found that there was improvement in technical efficiency along with regress in technologies causing major source of negative movements in productivity.

Therefore, from the literatures we noted that productivity changes can occur by either change in efficiency or technological changes or change in both.

3. Methodology

DEA-based Malmquist total factors productivity (TFP) index approach (Fare et al, 1994) is used to measure the productivity changes of DMUs at different points in time identifying the source of productivity changes and decompose total productivity changes into technical efficiency change (the catch up effect) and technological change (the frontier shift effect). The TFP change index between periods (t) and (t+1) is given by:

\[
M_1(x', y', x'^{t+1}, y'^{t+1}) = \frac{D_1^{t+1}(x'^{t+1}, y'^{t+1})}{D_1^{t}(x', y')} \left[ \frac{D_1^{t+1}(x'^{t+1}, y'^{t+1})}{D_1^{t}(x'^{t+1}, y'^{t+1})} \frac{D_1^{t+1}(x', y')}{D_1^{t}(x', y')} \right]^{1/2} = ECH \times TCH
\]
Where the notion $D_t^1$ denotes the input based distance function and $M^1_t$ is the product of technical efficiency change (EFC) and technological change (TCH). The efficiency change term (ECH) is equivalent to the ratio of Farrell technical efficiency in period $t+1$ divided by Farrell technical efficiency in period $t$. The technological change (TCH) term is the geometric mean of the shift in technology as observed at $(x^{t+1}, y^{t+1})$ (the first ratio inside the bracket) and shift in technology observed at $(x^t, y^t)$ (the second ratio inside bracket), it signifies whether the production frontier has shifted between the two periods (t) and (t+1) (Pharm, 2010). The ECH component may be greater than, equal to, or less than unity depending on whether efficiency of the evaluated DMUs (hospital in our study) improves (catching the frontier effect), stagnates, or declines. This will depend on the case. However, the TCH may also take a value greater than, equal to or less than unity in order to make the technological change be positive, zero, or negative respectively. A Malmquist Index greater than one indicate growth in productivity, where as the value less than one indicate a decline. MPI is widely used and more suitable in measuring the productivity in public sector since it doesn’t requires the prior behavioral assumptions about production technology nor inputs or outputs prices.

Malmquist Productivity Index (MPI) was proposed by Caves et al (1982), the estimation technique that measure Total Factor Productivity (TFP) change between the two data points in terms of ratios of distance functions (Zere, 2000) – it should be noted that total factor productivity measures the average products of all inputs (the opposite, partial factor productivity measure the average product of a single inputs).

**Data Sources and Descriptions**

Data used in this study are relating to hospitals inputs and outputs from 15 faith based (private not for profit) hospitals in Tanzania for the period from 2001 to 2012. These data were extracted from annual reports of the hospitals under study. Choice of the study period (2001-2012) was decided based on the availability and completeness of data required. Before 2002 most of the data/ annual reports from which the data could be extracted were missing in many hospitals under the study. Furthermore, the data set employed in the study was panel data; this also signifies the use of DEA based MPI approach since the technique is much suitable for panel data. To have representation of all VAHs, selection of hospitals was according to the Christian Social Service Commission (CSSC) zones which classifies faith based hospitals in Tanzania into five zones (i.e Lake zone, Northern zone, Western zone, Eastern zone and Southern zone) the aim was to have atleast representative of each zone in our study. The hospitals considered under the study was Volunteering Agency Hospitals (VAH)

**Variables and Model Selection**

DEA and DEA-based Malmquist Productivity Index (MPI) as the techniques for estimating frontier requires that unit of measurement of outputs to be homogeneous, unit dimensional and the output is measured cardinally (Coelli et al, 2005. However due to the heterogeneity and joint production nature of the hospitals service sector the most commonly used measure of the hospitals output is the number of inpatient days produced, since it is considered uni-dimensional and medically homogenous (Chowdhury et al, 2011).

Following the hospitals efficiency studies by Hu and Huang (2004); chang et al (2004); Pharm, (2011) hospitals outputs used in this study are proxied by outpatient visits, inaptnet days and surgical operation performed. The outpatient visits including scheduled visits to physicians and unscheduled visits to the emergency room of hospitals (Pharm, 2011). We follow Granneman et al (1986) with argument that inpatient days are homogeneous unit than the inpatient factor.

On the other hand inputs used to assess hospitals efficiency and productivity often classified into: recurrent resources (which is represented by labour and capital resources (represented by hospitals beds), therefore we follow previous hospitals studies by Pharm (2011); Chen (2006); Ferrari (2006) where such inputs were used in measuring hospitals performance.
4. Analysis of Findings and Discussion

Building on Zere (2000) we employed the DEAP 2.1 program developed by Coelli (1996b) to run and estimates DEA based Malmquist Productivity Indices. Input oriented and variables return to scale models is used in this study to compute a DEA- based Malmquist productivity index. An input oriented model is preferred in this study because unlike the outputs hospitals managers have more control over the hospital inputs (Zere, 2000; Ozcan, 2008). Pharm (2010) added that input oriented DEA framework has been widely applied in the literature on hospitals efficiency. Variable return to scale (VRS) were used because hospitals differ in sizes (Ozcan, 1998)-particularly number of beds.

Descriptive statistics for the output (outpatient’s visits, inpatient days and surgical operation performed) and inputs (which is represented by labour and capital resources) is represented in table 1 below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>totalinpat-s</td>
<td>180</td>
<td>39575.85</td>
<td>33600.17</td>
<td>1494</td>
<td>189432.6</td>
</tr>
<tr>
<td>totaloutpa-t</td>
<td>180</td>
<td>18382.21</td>
<td>14452.22</td>
<td>1359</td>
<td>63806</td>
</tr>
<tr>
<td>totalsurgi-n</td>
<td>180</td>
<td>1787.89</td>
<td>1189.029</td>
<td>77</td>
<td>6732</td>
</tr>
<tr>
<td>numberofbeds</td>
<td>180</td>
<td>191.3111</td>
<td>81.43142</td>
<td>60</td>
<td>320</td>
</tr>
<tr>
<td>fulltimest-s</td>
<td>180</td>
<td>1357.389</td>
<td>1028.916</td>
<td>20</td>
<td>2329</td>
</tr>
</tbody>
</table>

The MPI summary for the annual means is presented in Table 2. Over the years 2001/2002 – 2011/2012 The maximum and minimum total factor productivity index were 1.036 and 0.885 respectively. Decomposition of which gives the Efficiency change (EFFCH), Technological Change (TECHCH), Change in pure technical efficiency (PECH) and change in Scale efficiency (SECH) where their maximum and minimum indices are 1.140; 1.088; 1.061; 1.089  and 0.948; 0.814; 0.983; 0.958 respectively.

The result of the Malmquist productivity indices and all its components (presented in table 2) shows the geometric mean of all indices during entire period of 2001/2001 -2011/2012. The results indicates that the technical efficiency progressed (in the initial years) the first four years (2001/2002 -2004/2005) signifying the increase of 2 percent, 1 percent, 7.4 percent and 14 percent respectively. The trend reversed in the subsequent pairs of years (2005/2006 and 2006/2007) as well as in the year 2008/2009, 2010/2011 and 2011/2012. Due to improvement in the technical efficiency change in the first four years (2001/2002 - 2004/2005) as well as improvement in the years 2007/2008 and 2009/2010 the hospitals under the study have experienced an overall net efficiency progress with the value of 1.010, implying an increase of 1.0 per cent in technical efficiency per year. Furthermore, the results records that improvement in technical efficiency change is the determined by the simultaneous increase of 0.3 per cent in pure technical efficiency and 0.6 per cent in scale efficiency per year.

Meanwhile, the study revealed that technological change are regarded as mixed, that is regressing in the first four years (2001/2002 -2004/2005) before experiencing progression in the subsequent four years (2005/2006- 2008/2009) signifying the increase of 0.8 per cent, 0.08 per cent, 0.2 per cent and 0.4 per cent respectively. However, the observed increase (2005/2006- 2008/2009) was followed by a negative increased of 3.5 per cent in the year 2009/2010 before experiencing another positive increase of 0.7 per cent and 0.61 per cent in the year 2010/2011 and 2011/2012 respectively. The combined results give a net negative of 2.6 per cent per year in technological change.
Table 2: Malmquist Index Summary of Annual Means

<table>
<thead>
<tr>
<th>year</th>
<th>Technical Efficiency Change (EFFCH)</th>
<th>Technological Change (TECHCH)</th>
<th>Change in Pure-Technical Efficiency (PECH)</th>
<th>Change in Scale-Efficiency (SECH)</th>
<th>Total-Factor Productivity Change (TFPCH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001/2002</td>
<td>1.020</td>
<td>0.989</td>
<td>1.061</td>
<td>0.961</td>
<td>1.009</td>
</tr>
<tr>
<td>2002/2003</td>
<td>1.010</td>
<td>0.994</td>
<td>0.983</td>
<td>1.028</td>
<td>1.004</td>
</tr>
<tr>
<td>2003/2004</td>
<td>1.074</td>
<td>0.824</td>
<td>0.996</td>
<td>1.078</td>
<td>0.885</td>
</tr>
<tr>
<td>2004/2005</td>
<td>1.140</td>
<td>0.814</td>
<td>1.047</td>
<td>1.089</td>
<td>0.928</td>
</tr>
<tr>
<td>2005/2006</td>
<td>0.969</td>
<td>1.008</td>
<td>0.986</td>
<td>0.983</td>
<td>0.977</td>
</tr>
<tr>
<td>2006/2007</td>
<td>0.952</td>
<td>1.088</td>
<td>0.988</td>
<td>0.964</td>
<td>1.036</td>
</tr>
<tr>
<td>2007/2008</td>
<td>1.025</td>
<td>1.002</td>
<td>1.014</td>
<td>1.011</td>
<td>1.026</td>
</tr>
<tr>
<td>2008/2009</td>
<td>0.982</td>
<td>1.004</td>
<td>0.980</td>
<td>1.002</td>
<td>0.987</td>
</tr>
<tr>
<td>2009/2010</td>
<td>1.009</td>
<td>0.965</td>
<td>1.006</td>
<td>1.003</td>
<td>0.973</td>
</tr>
<tr>
<td>2010/2011</td>
<td>0.992</td>
<td>1.007</td>
<td>0.988</td>
<td>1.005</td>
<td>0.999</td>
</tr>
<tr>
<td>2011/2012</td>
<td>0.948</td>
<td>1.061</td>
<td>0.989</td>
<td>0.958</td>
<td>1.006</td>
</tr>
<tr>
<td>mean</td>
<td>1.010</td>
<td>0.974</td>
<td>1.003</td>
<td>1.006</td>
<td>0.984</td>
</tr>
</tbody>
</table>

Total factor productivity (TFP) which is the product of technical efficiency change and technological change also provides the mixed results during the period under the study. Overall productivity progressed in the first two years (2001/2002 and 2002/2003) before experiencing a reverse in the trend in the next subsequent three years (2003/2004 – 2005/2006) as well as the year 2008/2009, 2009/2010 and 2010/2011. The progression in total factor productivity was again experienced in the year 2006/2007, 2007/2008 and 2011/2012 where there was positive increase of 3.6 per cent, 2.6 per cent and 0.6 per cent respectively. Overall, the Volunteering Agency Hospitals (VAH) in Tanzania experienced a 1.6 per cent deterioration rate per year during the period under the study (2001/2002 – 2011/2012). This deterioration of 1.6 per cent per year is largely due to a decline (worsening) in technical progress (2.6 per cent per year) which counterbalanced the improvement in technical efficiency change which was very marginal (1 per cent per year).

General observation suggests that although the Volunteering Agency Hospitals (VAH) in Tanzania faced decline in overall productivity which is largely caused by worsening in technological progress, there is a slight improvement in technical efficiency change implying that the hospitals are getting closer to the production frontier (experiencing improvement in efficiency). However, worsening in the technological change has offset the improvement in efficiency change and lead to the deterioration of the total factor productivity.

Generally, values of Malmquist index or its components greater than one indicate progress or improvement in performance, while indices less than one shows the regress or deterioration of performance of the firm (Pharm, 2010) - in our case, Malmquist productivity index greater than or less than one implies progress or deterioration of hospitals performance respectively. The indices equals to one indicate that there is no change in performance. Fig1 indicate the movement of total factor productivity and its components during the period under the study.
The results found in our study to some extent are similar to those found in study of hospitals productivity in Vietnam conducted by Pharm (2010), in both studies there were technical efficiency improvement and worsening of the technological change. It was also observed that technological worsening was the main driver of the total factor productivity change. However, the two studies differ in the aspects of movement of total factor productivity change (TFP) where in Vietnam the overall productivity was improving (1.4 per cent per year) in Tanzania it was deteriorating (negative improvement 1.6 per cent per year). Results of the two studies conform to another study conducted in South Africa by Zere (2000). In the study conducted in South Africa it was observed that decline in technological progress was the main driver of the change in the total factor productivity. However, as it was in the case of Tanzania deterioration (1.6 per cent per year) of total factor productivity, in South Africa the total factor productivity dropped by 12.1 per cent per year.

Observation in other studies conducted by the Sahin et al (2009) in Turkey and Maniadakis et al (1999) revealed that technological progress was the main driver of the improvement in total factor productivity. Sahin et al pointed that investment by Turkish Ministry of Health in 2007 in general hospitals caused a slight improvement, but rather than there was a decline in technological progress in the subsequent years which left overall productivity unchanged. In the study conducted by Maniadakis et al (1999) the author found that productivity changes are dominated by technological changes with a little change in hospital efficiency.

5. Conclusion and Recommendations

This study evaluated the total factor productivity (TFP) and its components of 15 Volunteering Agency Hospitals (VAHs) in Tanzania using MPI. The findings lend support to the already existing literatures on hospitals productivity in developing countries. The results from our study throw lights on empirical evidence on the performance (productivity measurements) of Volunteering Agency Hospitals (VAH) in Tanzania. Literatures document that in some studies technological change was found to be the dominant factor while in other it was the change in technical efficiency that played the influencing role to the change in overall productivity change.

Our study records that overall productivity change was largely dominated by improvement in technical efficiency change and positive change in technical efficiency seems to outweigh the impact on overall productivity (which seems to deteriorate) due to technological regress. The decline in overall productivity of
Volunteering agency hospital in Tanzania is an issue to both the government and faith based organizations whose hospitals are regarded as units of study in this paper. To the government it is the set back to the government’s efforts to improving delivery of health care in Tanzania. As the regulator, supervisor and policy maker, in the past two decades the government through the Ministry of Health and Social Welfare (MoHSW) has been undertaking several measures including health policy reforms and subsidizing the private hospitals particularly private not for profit hospitals with the aim of improving among other things the efficiency and productivity of hospitals.

Generally, this study suggests that the government should increase its investment and support to these hospitals in order to realize the technological progress as well as the overall productivity. As it was observed in the study by Sahin et al (2009) improvement in technological progress and overall productivity was the results of increase in investment by Turkish government in public health. However, faith based organization are urged to adopt new strategies that would enhance productivity performance of these hospitals. Our study suggests that future studies and natural extension of this work would be to determine the causes of decline in the technological change which led to the deterioration of the overall productivity of the volunteering agency hospitals in Tanzania.

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## Appendix 1: Malmquist Index Summary of Hospitals’ Means

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Technical Efficiency Change (EFFCH)</th>
<th>Technological Change (TECHCH)</th>
<th>Change in Pure-Technical Efficiency (PECH)</th>
<th>Change in Scale-Efficiency (SECH)</th>
<th>Total Productivity Change (TFPCH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bukumbi Hosp</td>
<td>1.014</td>
<td>0.986</td>
<td>1.004</td>
<td>1.010</td>
<td>1.000</td>
</tr>
<tr>
<td>2 Iambi Hosp</td>
<td>0.992</td>
<td>0.959</td>
<td>1.000</td>
<td>0.992</td>
<td>0.952</td>
</tr>
<tr>
<td>3 Igongwe Hosp</td>
<td>1.052</td>
<td>0.965</td>
<td>1.051</td>
<td>1.002</td>
<td>1.015</td>
</tr>
<tr>
<td>4 Ilembula Hosp</td>
<td>0.997</td>
<td>0.995</td>
<td>1.000</td>
<td>0.997</td>
<td>0.952</td>
</tr>
<tr>
<td>5 Lugalawa Hosp</td>
<td>1.000</td>
<td>0.976</td>
<td>1.000</td>
<td>1.000</td>
<td>0.976</td>
</tr>
<tr>
<td>6 Lutembo Hosp</td>
<td>1.000</td>
<td>0.987</td>
<td>1.000</td>
<td>1.000</td>
<td>0.987</td>
</tr>
<tr>
<td>7 Marangu Hosp</td>
<td>1.027</td>
<td>0.966</td>
<td>1.000</td>
<td>1.027</td>
<td>0.993</td>
</tr>
<tr>
<td>8 Mbesa Mission</td>
<td>0.994</td>
<td>0.978</td>
<td>0.995</td>
<td>0.999</td>
<td>0.973</td>
</tr>
<tr>
<td>9 Mbozi Mission</td>
<td>1.006</td>
<td>0.982</td>
<td>1.000</td>
<td>1.006</td>
<td>0.989</td>
</tr>
<tr>
<td>10 Mkula Hosp</td>
<td>0.984</td>
<td>1.008</td>
<td>0.980</td>
<td>1.005</td>
<td>0.992</td>
</tr>
<tr>
<td>11 Ndalage Hosp</td>
<td>1.051</td>
<td>0.964</td>
<td>1.010</td>
<td>1.041</td>
<td>1.013</td>
</tr>
<tr>
<td>12 Nkinga Hosp</td>
<td>0.996</td>
<td>0.973</td>
<td>1.009</td>
<td>0.987</td>
<td>0.969</td>
</tr>
<tr>
<td>13 Nkoaranga Hosp</td>
<td>0.993</td>
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<td>1.007</td>
<td>0.987</td>
<td>0.952</td>
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<td>14 ST.Bernedict</td>
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<td>0.990</td>
<td>1.014</td>
<td>1.081</td>
<td>1.085</td>
</tr>
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<td>15 Uhai Baptist</td>
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<tr>
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<td><strong>0.984</strong></td>
</tr>
</tbody>
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- EffCH<1=07
- EffCH=1=02
- EffCH>1=06
- TechCH<1=14
- TechCH=1=00
- TechCH<1=01
- PeffCH<1=03
- PeffCH=1=06
- PeffCH>1=06
- SeffCH<1=06
- SeffCH=1=02
- SeffCH>1=07
- TfpCH<1=11
- TfpCH=1=01
- TfpCH>1=03