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A First Look at the Efficiency-Quality Nexus in Soum Health Centers in Mongolia: Insights from Two Surveys

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Abstract

This Working Paper explores whether technical efficiency and quality of care are aligned in Mongolia's Soum Health Centers (SHCs), which are central to rural primary health care and universal health coverage (UHC). Using 2018 data from two studies—one assessing SHC efficiency with DEA (Simar & Wilson double bootstrap), the other measuring service perceived quality with SERVQUAL and potential quality with SARA—the authors analyse 31 SHCs across seven regions (aïmags). Average technical efficiency is 0.73, implying that SHCs could, in principle and in average, maintain current output levels with about 27% fewer inputs, freeing resources for other PHC priorities. Perceived quality, however, is modest (mean SERVQUAL 0.49), and the correlation between efficiency and perceived quality is negative, including for most SERVQUAL dimensions. By contrast, efficiency shows only weak and statistically non-significant associations with SARA-based availability, readiness and a composite "Potential Effective Quality" index. The paper discusses behavioural and institutional mechanisms behind this disconnect, stressing that perceived quality is a major driver of demand, while SARA captures capacity rather than actual quality care. It concludes with policy recommendations aimed at enabling authorities to make informed decisions about aligning efficiency and quality of care: updating and expanding sample and metrics, assessing real healthcare quality in high- and low-efficiency SHCs, explicitly integrating efficiency drivers and contextual factors when analysing quality issues, and systematically feeding back findings to managers, frontline team and central decision-making levels.

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Introduction[1]

Since the 1990s, Mongolia has achieved large progress in health outcomes, following the transition of its health system from the former Semashko model. The enactment of the Health Act in 2011 formally prioritized primary health care (PHC) and the advancement of universal health coverage (UHC) as central objectives of the Mongolian health policy.

On August 28, 2020, the Mongolian Parliament passed legislative amendments to the Laws on Health, Health Insurance, and Medical Care and Services. These amendments aimed to establish a legal foundation for reconfiguring health sector financing to improve institutional performance, implement international performance-based financing mechanisms, ensuring the conditions to have problem-free access to essential care services and enhance UHC.[2]

In 2021, the government introduced a comprehensive reform to health insurance financing, establishing a single-purchaser model. Under this framework, the National Council of the Health Insurance Fund consolidated decision-making regarding benefits, contracting, purchasing, and quality control. Consequently, the state budget began transferring funds earmarked for health services under government responsibility to the Health Insurance Fund, with the Health Insurance General Office acting as the purchaser for both state budget allocations and enrollee contributions.

However, despite considerable progress and a coherent, proactive policy framework supported by external partners, particularly the Asian Development Bank and WHO, Mongolia continues to face critical challenges in advancing UHC.

Among these challenges are substantial unmet healthcare needs, persistent financial barriers to accessing care, and marked disparities in care quality, including within primary health care (PHC) services (Batbaatar et al., 2017; Otani et al., 2018; Jigjidsuren et al., 2021). More broadly, quality of care remains a pervasive and deeply rooted challenge across LMICs. Kruk et al. (2018) argue that poor-quality care is a greater obstacle to reducing mortality than lack of access alone.

Additionally, Mongolia confronts severe financial constraints affecting both contributory insurance and budgetary funding. Budgetary limitations stem not only from the underlying macroeconomic and fiscal context, which remains vulnerable to external economic shocks, with the weakening economic outlook calling for greater policy and fiscal prudence that will be essential to restoring external and internal balances, requiring adherence to fiscal rules (IMF, 2024; 2025). The constraints come also from the government's extensive subsidization of "vulnerable groups", comprising approximately 70% of the population.[3] These groups, whose health insurance contributions are fully subsidized by the state, represent a considerable financial burden on the health system.

Morever, as in every country, funding healthcare from public resources competes with other priorities. These include the massive land degradation due the strong livestock growth during

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[2] According to the WHO, UHC is defined as ensuring that all individuals have access to the full range of essential quality health services when they need them, without incurring financial hardship. This includes health promotion, prevention, treatment, rehabilitation, and palliative care.

[3] Children under 16 years old, pensioners, citizens needing social assistance (people with disabilities, orphans, single old people, and others), women taking care of children under 2 years.

the last decade and the growing frequency of extreme climatic phenomena (*dzud*, the one in winter 2023-24 having been particularly severe) boosting migration to cities, increasing the number of urban poor (Sainnemekh et al., 2021).

In this context, optimising the efficiency of health-care facilities has become a critical policy concern. Efficiency, broadly defined as delivering more and better services with the same resources, or achieving the same level of service with fewer resources, is essential in a resource-constrained environment. Failing to address inefficiencies in health service delivery is like turning up the heat in winter while leaving the windows open—*a waste of scarce resources*.

However, the potential impact of efficiency measures on healthcare quality remains a contentious issue. Literature reveals mixed findings, with studies suggesting positive, negative, or negligible correlation or effects of efficiency on care quality. This paper explores the relationship between efficiency and quality of care in the context of sum health centers (SHCs), the cornerstone of rural PHC and UHC in Mongolia. Specifically, it examines whether efficiency and quality of care in SHCs align, diverge, or exhibit no discernible relationship, and discusses the implications for supporting appropriate health policy.

The subsequent sections outline the data sources (§ 2), present the assessment of SHCs efficiency and of quality (§ 3), relationships between efficiency, quality (§ 4) and ability of SHCs to deliver quality care (§ 5). The findings analysis and policy recommendations for supporting policy-makers in designing and implementing relevant measures to align efficiency and healthcare quality are respectively in § 6 and 7.

1. Data Sources

The analysis draws on data from two key studies: one assessing the efficiency of SHCs and another examining the quality and accessibility of PHC services in SHCs and family health centers (FHCs), although the latter are not included in this analysis.[4] Hereafter, these studies are referred to as the Efficiency Study and the Quality Study, respectively.

- Efficiency Study: Guillon M., Mathonnat J., Narantuya B., Dorjmyagmar B., Enkhtsetseg E. (2022) Exploring the efficiency of primary health care provision in rural and sparsely populated areas: a case study from Mongolia. *Health Policy and Planning*, vol. 37(7), August, pp. 822-835. This article is based on Guillon M., Mathonnat J., Narantuya B., Dorjmyagmar B., Enkhtsetseg E. (2020), *Efficiency of Soum Health Centers in 2017 and 2018 - Assessment and Policy Implications*, Report to the Center for Health Development, Mongolia, 69p.
- Quality Study: Daavalkhan D., Lkhagvasuren K., Luvsan M-E. (2020), *The quality and access to primary health care service in Mongolia*, Mongolian National University of Medical Sciences and World Health Organisation, Ulaanbaatar.

[4] For quality in FHCs; see also Jigjidsuren, et al., 2019.

Both studies provide data for 2018.[5] The Quality Study includes 32 SHCs, while the Efficiency Study includes 262, from which efficiency data are extracted for 31 of the 32 SHCs in the Quality Study. They are distributed across 7 regions (aimags). The data used come from the Ministry of Health, the Center for Health Development, and surveys conducted by the Quality Study team for the latter. The distribution of efficiency scores in the sample is close to that of the 262 SHCs in the Efficiency Study.

However, the small sample size significantly limits the use of advanced quantitative methods, including econometric analyses. Consequently, the analysis presented in this document is framed as an initial *exploratory assessment to support the decision-making process of policymakers* towards appropriate initial measures and draw the attention of their external partners and other stakeholders.

2. Assessing SHCs efficiency and quality of care

The analysis focuses on the relationship between SHC efficiency and quality of care, rather than patient satisfaction, which is usually calculated as the gap between patients' perceived quality and their initial expectations regarding service quality. But, from a policy-oriented recommendation perspective, its usefulness is limited. For instance, a patient may anticipate receiving substandard care but, upon receiving treatment, perceive it as slightly better than expected and therefore report being satisfied, despite the objectively low quality of care delivered.

Assessing efficiency of SHCs

In the Efficiency Study the technical efficiency of SHCs has being assessed using DEA Simar and Wilson approach with double bootstraping (Simar and Wilson, 2007). The purpose of the DEA method[6] is to construct a piecewise linear envelopment frontier over the data points such that all observed points lie on or below the production frontier. The efficiency level of each SHC is then measured by calculating the difference between the point representing the observed values of inputs (resources) and outputs of this SHC and the frontier that determines the best observed practices in the whole sample (here, activities)[7]. In DEA, the efficiency frontier is then

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[5] The Efficiency Study covers also 2017.

[6] Using DEA, a non-parametric method, has the great advantage over parametric methods of not having to make any assumptions about the production function of care facilities, which is unknown.

[7] Five models were used, varying the inputs and outputs. The results are very similar. In keeping with the principle of parsimony in econometrics, the preferred model includes as i) inputs: doctors, other healthcare professionals, number of beds [other models include, for example, doctors, nurses, other healthcare professionals, non-healthcare staff] ii) outputs: Inpatients, preventive visits, non-preventive visits [other models incorporate bed days]. Inputs and outputs are combined in 5 models giving very close results as indicated above.

estimated from the data within the sample and SHCs are compared to each other, their efficiency being not assessed by reference to a more or less debatable "standard."

DEA has been widely used in the literature to estimate the technical efficiency of health facilities of various levels of care in high-, middle- and low-income countries (LMICs). We measure SHCs' efficiency with an input orientation, i.e., SHCs aim to minimize inputs used to produce a given volume of outputs. This input orientation was chosen for the following reason. Unlike an output orientation, which implicitly assumes that efficiency gains in SHCs will be spent in SHCs on producing more of the same outputs in a more or less homothetic way or proportion, the input orientation contains no implicit assumptions about what should be achieved with the resources freed up by an efficiency improvement. Those freed-up resources could be used to produce more of the same outputs at the SHC level if demand exists. It could also serve through other channels to reinforce PHC, which is needed in Mongolia, for example by allocating these additional resources to mobile health services more able to reach remote populations, by subsidizing transportation costs to SHCs if such costs constitute barriers to healthcare access or by strengthening arrangements for transferring patients from SHCs to referral facilities when needed to address coming epidemic challenges, boosting the fight against noncommunicable diseases (NCDs) and so on.

The mean efficiency score for the 31 SHCs considered in this study was 0.73 (median = 0.75)[8]; Table 1. This average efficiency level is not atypical, and corresponds to the order of magnitude generally found in the literature for low-, middle- and high-income countries (cf. references in Guillon, Mathonnat et al., 2022; Gok and Sezen, 2013). An OECD study (2017) sounded the alarm on issues of healthcare expenditure efficiency in OECD countries, pointing out that "A significant share of health spending in OECD countries is at best ineffective and at worst, wasteful. (…). Overall, existing estimates suggest that one-fifth of health spending could be channelled towards better use" (p. 11).[9]

The implications of the average efficiency score of 0.75 for SHCs are substantial for health policy. On average, these 31 SHCs could potentially maintain their current level of activity while reducing overall resource utilization by approximately 27%. For the least efficient quartile, the potential reduction is around 34%, while for the most efficient quartile, it is about 20%. This indicates a significant opportunity for savings that could considerably enhance the government's flexibility in shaping health policy and UHC financing in rural areas.

But it is important to emphasize that the efficiency gains achieved should not be used as a justification for reducing the health budget. Instead, they should be reinvested in the health sector to genuinely translate into increased resources for healthcare. This is a critical point of

[8] These results are therefore very similar to those of the aforementioned Efficiency Study, which looked at 262 SHCs and found an average efficiency score of 0.76.

[9] "One in ten patients is adversely affected during treatment by preventable errors, and more than 10% of hospital expenditure is allocated to correcting such harm. Many more patients receive unnecessary or low-value care. A sizable proportion of emergency hospital admissions could have been equally well addressed or better treated in a primary care setting or even managed by patients themselves, with appropriate education. Large cross-country variations in antibiotic prescriptions reveal excessive consumption, leading to wasted financial resources and contributing to the development of antimicrobial resistance. The potential for generic medicines remains underexploited. Finally, a number of administrative processes add no value, and money is lost to fraud and corruption".

vigilance, as evidence from several countries indicates that resources freed up through efficiency gains in the health sector are often reallocated to other sectors (Barroy et al., 2021). The resources freed up through efficiency gains in SHCs could, for instance, be reallocated to address unmet health needs, enhance the quality of primary health care as part of Mongolia's UHC strategy, or incentivize physician placements in under-resourced and remote SHCs, etc.

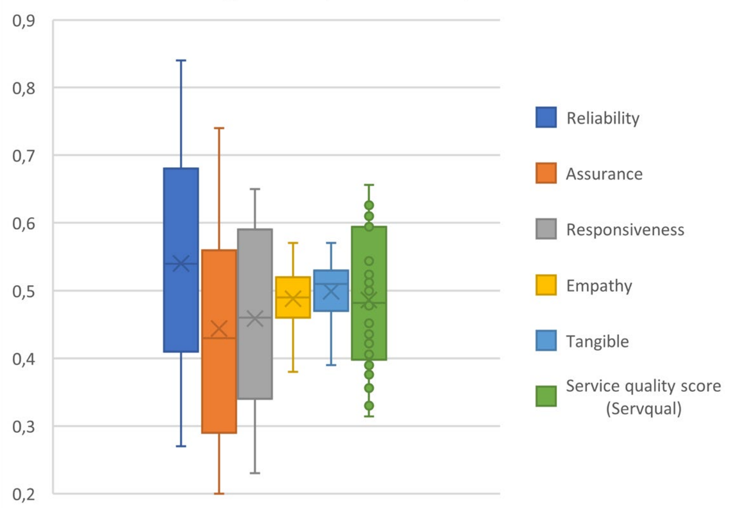
Assessing perceived quality of health care

The Quality Study uses the SERVQUAL model (Parasuraman, Zeitham, and Berry (1985) originally designed to assess consumer (patient) perceptions of the quality of services offered in consumer and retail businesses. It is the most commonly used model to measure health care service quality (Fatima et al., 2019; Jonkiz et al., 2022, 2023; Lu et al., 2020; Technizi zt al., 2018) and is consistent with other approaches, such as Donabedian's (1988) distinction between structure, process and outcome indicators.

Five dimensions are considered (for more details, cf. the Quality Study).

- *Tangibles*: This refers to the physical appearance of healthcare facilities, medical equipment, and staff. It also covers cleanliness, comfort, and the overall aesthetic of the healthcare environment.
- *Reliability*: This dimension aims to assess the ability of healthcare providers to consistently deliver accurate and dependable care. It focuses on whether the services promised are delivered correctly and in a timely manner.
- *Responsiveness*: This is about staff behavior. It captures the willingness and ability of healthcare providers to help patients and respond promptly to their needs.
- *Assurance*: This dimension evaluates the confidence that patients have in their healthcare providers, focusing on the competence, courtesy, and professionalism of the staff, as well as their ability to inspire trust and confidence.
- *Empathy*: It focuses on the individualized care and attention patients receive, ensuring that healthcare providers show genuine concern for their patients and their well-being. The perceived quality indicator is the unweighted arithmetic mean of the five dimensions

Fig. 1. Servqual ad its components



The Service Quality Score (SERVQUAL) measuring the quality of care as perceived by users (cf. above) averages 0.49 (median = 0.48), with 0.40 for the first quartile and 0.57 for the third, the maximum and minimum being 0.66 and 0.31 respectively. Taken together, these results show that, as with efficiency, there is considerable room for improvement. (cf. Table 1 and Figure 1).

3. Relationship between Efficiency and Quality care as perceived by patients

The global picture

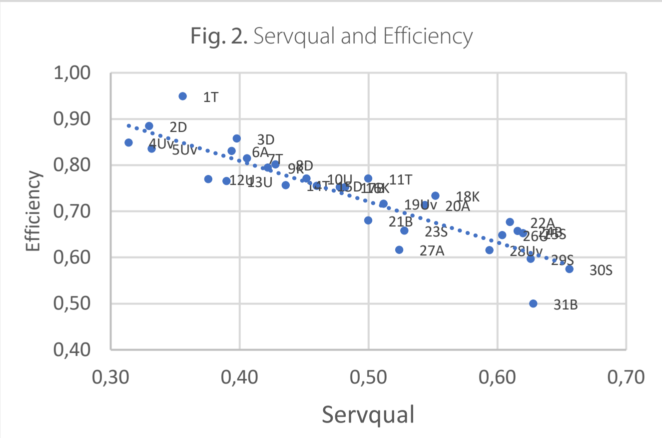


Fig. 2. Servqual and Efficiency

The relationship between efficiency and the global SERVQUAL score is negative, significant and very close, with a correlation coefficient of -0.897 and a Spearman rank correlation coefficient of -0.924. This means that a comparatively high level of efficiency is associated with a comparatively low perceived quality of care. Refer to Table 1 which presents the efficiency scores and the perceived quality index for the 31 SHCs. This is also shown in Figures 2 and 3. Each dot represents a SHC. The number on the label corresponds to the SHC number in Table 1, and the letter to the province identifier in the same table. For example, 21T denotes the SHC of Bayan in the province of Tuv. There is no clear regional (aimag) specificity in either efficiency or quality scores.

This global negative efficiency-perceived quality relationship is also found when considering the five dimensions that make up the SERVQUAL score (Figure 3).

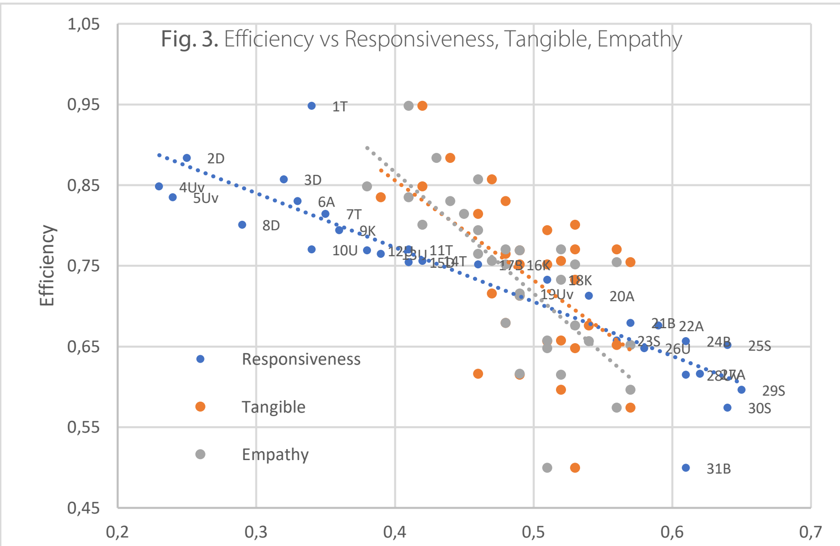


Fig. 3. Efficiency vs Responsiveness, Tangible, Empathy

Responsiveness, r=-0.904; Assurance, r = -0.836; Reliability, r = -0.796; Empathy, r = -0.744, and Tangible, here with a much weaker relationship with efficiency than for the other dimensions, r=-0.554.

This negative and significant relationship between efficiency and perceived quality is the one that dominates the literature (cf. § 6).

Table 1. Technical Efficiency scores et Quality Indexes

Table over two pages

	Province	Soum	Efficiency score	*Rank Efficiency score*	Service Quality score SERVQUAL	*Rank SERVQUAL*	Service Availability index	Rank Service Availability index	Service Readiness index	Rank Service Readiness index	*Potential Effective Quality index*	*Rank Potential Effective Quality index*
1A	Arkhangai	Jargalant	0,830	*6*	0,39	*25*	89,54	*12*	72,91	*18*	0,78	*15*
2A	Arkhangai	Khotont	0,616	*27*	0,52	*12*	90,26	*10*	86,46	*10*	0,76	*20*
3A	Arkhangai	Tsenkher	0,676	*22*	0,61	*6*	76,78	*26*	95,70	*1*	0,69	*26*
4A	Arkhangai	Ugiinuur	0,713	*20*	0,54	*10*	80,18	*23*	95,31	*3*	0,83	*9*
5B	Bayankhongor	Bayan-Ovoo	0,752	*17*	0,48	*17*	87,80	*16*	76,39	*15*	0,84	*3*
6B	Bayankhongor	Bayanlig	0,679	*21*	0,50	*14*	85,08	*21*	95,44	*2*	0,80	*14*
7B	Bayankhongor	Bogd	0,500	*31*	0,63	*2*	85,27	*20*	82,05	*13*	0,81	*12*
8B	Bayankhongor	Ulziit	0,657	*24*	0,62	*5*	76,57	*27*	55,16	*29*	0,76	*19*
9D	Dornogovi	Erdene	0,884	*2*	0,33	*30*	96,17	*1*	66,84	*25*	0,86	*2*
10D	Dornogovi	Altanshiree	0,755	*15*	0,46	*18*	93,01	*4*	42,27	*31*	0,70	*25*
11D	Dornogovi	Dalanjargalan	0,857	*3*	0,40	*24*	89,28	*13*	50,45	*30*	0,6	*27*
12D	Dornogovi	Ulaanbadrakh	0,801	*8*	0,43	*21*	77,46	*25*	68,85	*22*	0,84	*6*
13U	Umnugovi	Manlai	0,765	*13*	0,39	*26*	91,51	*7*	86,72	*9*	0,83	*7*
14U	Umnugovi	Nomgon	0,648	*26*	0,60	*7*	90,31	*9*	66,89	*24*	0,83	*8*
15U	Umnugovi	Sevrei	0,769	*12*	0,38	*27*	91,97	*5*	87,96	*7*	0,65	*29*
16U	Umnugovi	Tsogt-Ovoo	0,770	*10*	0,45	*19*	77,85	*24*	75,32	*16*	0,71	*24*
17S	Sukhbaatar	Asgat	0,657	*23*	0,53	*11*	91,12	*8*	74,11	*17*	0,81	*13*
18S	Sukhbaatar	Naran	0,652	*25*	0,62	*4*	43,41	*31*	94,31	*5*	0,78	*16*
19S	Sukhbaatar	Khalzan	0,574	*30*	0,66	*1*	62,16	*29*	67,15	*23*	0,83	*10*
20S	Sukhbaatar	Erdenetsagaan	0,596	*29*	0,63	*3*	56,73	*30*	65,88	*26*	0,78	*17*
21T	Tuv	Bayan	0,770	*11*	0,50	*14*	69,57	*28*	69,55	*21*	0,88	*1*

22T	Tuv	Bayanchandmani	0,814	*7*	0,41	*23*	89,54	*11*	78,39	*14*	0,84	*5*
23T	Tuv	Mungunmorit	0,756	*14*	0,44	*20*	85,40	*19*	87,14	*8*	0,78	*18*
24T	Tuv	Sergelen	0,948	*1*	0,36	*28*	84,60	*22*	72,49	*19*	0,71	*23*
25Uv	Uvs	Malchin	0,716	*19*	0,51	*13*	94,78	*2*	82,32	*12*	0,65	*28*
26Uv	Uvs	Naranbulag	0,615	*28*	0,59	*8*	86,82	*17*	63,10	*27*	0,76	*21*
27Uv	Uvs	Zavkhan	0,835	*5*	0,33	*29*	91,67	*6*	88,09	*6*	0,84	*4*
28Uv	Uvs	Sagil	0,848	*4*	0,31	*31*	93,59	*3*	83,22	*11*	0,75	*22*
29K	Khovd	Zereg	0,794	*9*	0,42	*22*	85,67	*18*	94,56	*4*	0,61	*30*
30K	Khovd	Myangad	0,752	*16*	0,48	*16*	88,25	*14*	55,66	*28*	0,56	*31*
31K	Khovd	Erdeneburen	0,733	*18*	0,55	*9*	88,01	*15*	71,55	*20*	0,83	*11*
		Average	0,73		0,49		83,56		75,88		0,77	
		Median	0,75		0,48		87,80		75,32		0,78	
		Coef. Var.	0,14		0,21		0,14		0,18		0,10	
		1rst Quart	0,66		0,40		79,01		67,02		0,71	
		3rd Quart.	0,80		0,57		90,71		86,93		0,83	
		Max	0,95		0,66		96,17		95,70		0,88	
		Min	0,50		0,31		43,41		42,27		0,56	

Beyond overall picture, looking at sub-samples

We divided the 31 SHCs into groups based on different criteria to assess whether there were differences between them groups regarding the relationship between efficiency and perceived quality.

First, we considered the SHCs in relation to the median efficiency scores. As shown in Figure 4, the perceived quality level is significantly higher for SHCs with efficiency scores below the median than for those above, whether in terms of the mean, the median, or the distribution. Differences are statistically significant at the 1% level (Wilcoxon-Mann-Whitney test). The same applies to Reliability, Assurance, Responsiveness, and Empathy (but not Tangible), components of the quality score.

We conducted a similar analysis by dividing the sample into three groups: the 10 SHCs with the highest and lowest efficiency scores and the 11 SHCs in between (Fig. 5. From left to right, 10 lowest, 11 average and 10 most efficient SHCs).

The findings are consistent with the above, with statistically significant differences in perceived quality levels between the three sub-samples at the 1% level (Kruskal-Wallis test). The same applies to comparisons of sub-group pairs (p-value adjusted by Bonferroni correction). As above, the same pattern holds for Reliability, Assurance, Responsiveness, and Empathy, but not for Tangible.

Fig. 4. Servqual, below and above the Efficiency median

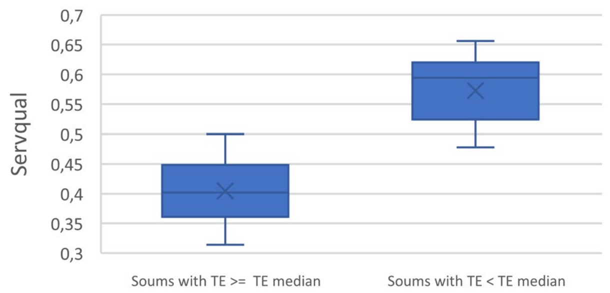
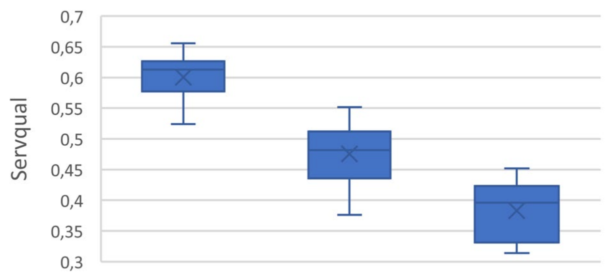


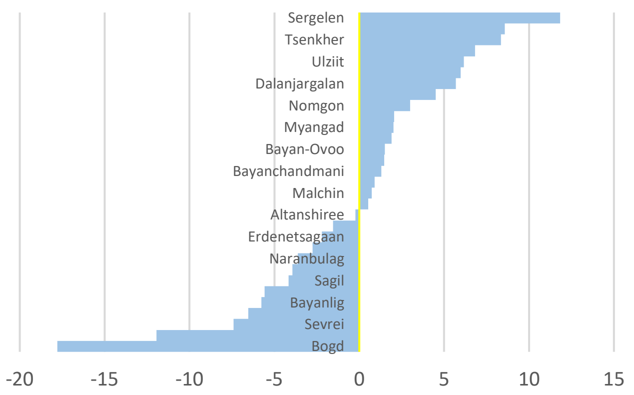
Fig. 5. Servqual according to the Efficiency scores of 3 SHCs groups



Do the SHCs with the highest and lowest efficiency scores relative to their estimated value display different perceived quality scores?

We regressed the global SERVQUAL scores on the technical efficiency scores. We then calculated, for each SHC, the SERVQUAL score minus its estimated value. The estimated value represents the expected SERVQUAL score if the considered SHC was to behave "on trend – on average" like the others, i.e., the value given by the intersection with the fitting line. For instance, CHS 15U, Servei in Umnugovi province, has a SERVQUAL score of 0.38 and an efficiency score of 0.77. If the SERVQUAL-Efficiency relationship mirrored that of the other SHCs, we would expect it to have a SERVQUAL score of 0.45 (intersection with the fitting line). Thus, the more an SHC is positioned below the fitting line (as in the case of 15U), the stronger the negative Efficiency-SERVQUAL relationship is for it, compared to other SHCs. Conversely, the higher an SHC is positioned above the line, the weaker this negative relationship is for it; such is the case for SHC 31K, Erdeneburen in Khov province. The results are displayed in Fig. 6.

Fig. 6. Servqual regressed on Efficiency scores
(Observed value - Fited value) % Obs. value



4. Efficiency and the capacity of SHCs to deliver quality care

We examined the relationship between efficiency and three indicators that are not subjective measures of perceived quality by patients but an assessment of the capacity of SHCs to deliver quality care: Availability, Readiness, and Potential Effective Quality (PEQ) based on SARA (Service Availability and Readiness Assessment model).

Readiness Index. It assesses the preparedness of SHCs to deliver essential healthcare services based on five dimensions:

- *Basic amenities*: including the availability of vaccines and other healthcare commodities.
- *Basic equipment*: Functional medical equipment, electricity, water, and other essential facilities.
- *Essential medicines.*
- *Standard precautions*, including guidelines for infection prevention and emergency management.
- Diagnostic capacity.

Availability Index. It evaluates the availability of items required to provide quality essential health services, plus service utilization. It includes three dimensions:

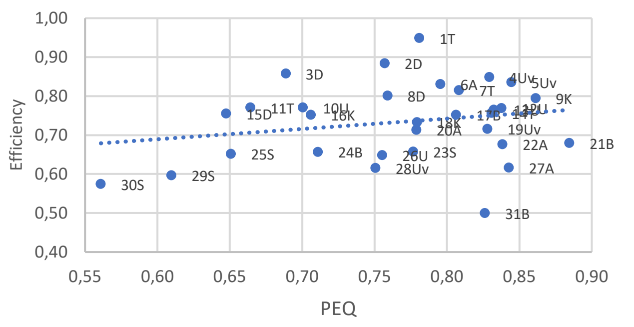
- *Equipment*: The presence of essential infrastructure, medical supplies, and equipment.
- *Health Workforce*: The availability of trained healthcare personnel and their readiness to deliver services.
- *Service Utilization*: The extent to which essential services (e.g., maternal health, immunization) are provided. Outpatient and inpatient service utilization are considered.

The index is calculated as the unweighted average of the three dimensions.

There is no relationship between efficiency and Readiness, a positive, albeit weak, relationship between efficiency scores and the Availability indicator (r=0.402), but it is not statistically significant. This relationship is largely driven by four SHCs: Naran (25S), Erdenetsagaan (29S), Khalzan (30S) in Shurkhbaatar aimag, and Tsogt-Ovoo (10U) in Unmugovi aimag.

Potential Effective Quality (PEQ). To refine the analysis and to better assess the capacity of SHCs to deliver quality care, we developed a PEQ index as the unweighted arithmetic average of the components of the Availability and Readiness indexes, but excluding the Service Utilization index. The rationale for this exclusion is that it is not a capacity index and that utilization may be influenced by patients' perceptions of service quality. Thus, the PEQ index comprises Basic Equipment, Diagnostic Capacity, Essential Medicines, Infrastructure, and Health Workforce scores.

Fig. 7. Efficiency and Potential Effective Quality



The PEQ index is positively but weakly associated with efficiency scores (r=0.264), and the relationship is not statistically significant; Figure 7. When efficiency scores are regressed on the quality perception indicator (SERVQUAL) plus the PEQ indicator, the relationship turns negative, but the coefficient of PEQ is not significant, implying that the results are not interpretable.

5. Unpacking the Meaning of the Results

Efficiency has become one of the central challenges facing health policymakers in Mongolia. This is occurring at a time when substantial unmet health needs persist—most notably for non-communicable diseases—despite the progress achieved over the past twenty years. At the same time, unit costs continue to rise and financial constraints remain tight, as illustrated by the difficulties encountered in financing the Mongolian health system since the summer of 2025.

The relationships highlighted in this study between the efficiency of SHCs, the quality of care perceived by patients (SERVQUAL indexes) and the capacity of SHCs to deliver healthcare quality (SARA indexes, including PEQ) raise important questions that must be addressed with determination. The table 2 below summarizes the associations between SHC efficiency, SERVQUAL, and SARA readiness, availability and Potential Effective Quality indexes: negative correlation with SERVQUAL; non-significant with SARA.

Table 2. Correlations between Efficiency scores with SERVQUAL and SARA indicators.

SERVQUAL (global)	Negative	Significant
Responsiveness		
Tangible		
Empathy		
SARA		
Readiness	No relationship (r=0,081)	Non-significant
Availability	Positive	Non-significant
Potential Effective Quality	Positive	Non-significant

The results obtained are not atypical. The dominant conclusion of the international literature—whether in hospitals or primary health-care facilities—is that the correlation between technical efficiency and perceived quality (measured through SERVQUAL-type instruments) or potential quality (measured through SARA-type readiness and equipment availability indicators, or similar frameworks) is very often negative (see, among others, OECD 2017, 2023; Li et al., 2023; Wang et al., 2022; Bashir and Nasir, 2020; Ferreira and Marques, 2019; Choi et al., 2017; Yang et al., 2014; Gok and Sezen, 2013), weak, or statistically insignificant and very rarely positive (Alhassan, 2019; Kruk et al., 2018; Leslie et al., 2017; Nabilou and Yuzefzadeh, 2018; Mbau et al., 2020; Tadesse et al., 2021), *This is precisely what we observe for SHCs.*

Four sets of factors —stemming from both demand-side and supply-side mechanisms—help unpacking the meaning and the policy implications of these findings.

i. Perceived quality is a major driver of health-service utilization. Perceived quality of care, as measured through SERVQUAL or related approaches, has become a central determinant of health-care utilization in low- and middle-income countries (LMICs). A substantial body of empirical work demonstrates that the way users experience care—interpersonal relations, staff attitude, communication, waiting time, drug availability, cleanliness, and perceived provider competence—*strongly shapes whether, where, and when individuals seek care (*Ali et al., 2018; Antiga et al., 2025; Arval et al., 2024; Conlan et al, 2023; Deger et al, 2024; Doubova, 2024; Hussien et al, 2024; Kamra, et al., 2016; Mali et al., 2025).

From a behavioural economics perspective, individuals assess health services under conditions of bounded rationality and rely on cognitive shortcuts when information is incomplete or complex. These heuristics shape how patients perceive and value care processes. SERVQUAL captures the service attributes that are most salient and emotionally accessible to patients—cleanliness, waiting time, courtesy, empathy, and interpersonal relations. Moreover, patients often infer technical competence from interpersonal warmth and respectful communication, a mechanism sometimes referred to as the "trust heuristic."

The explanatory power of perceived quality for health-care demand is reinforced by behavioural models such as the Health Belief Model (HBM), which posits that care-seeking behaviour depends on perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action. Better interpersonal quality, respectful treatment, and signs of competence increase the perceived benefits of seeking care—that is, patients expect that going to the facility will effectively address their health problem. Good communication and clarity of information enhance self-efficacy. This is particularly true in rural Mongolia, where herders and socially marginalized populations often feel less confident engaging with formal services, especially at SHCs located in very remote areas.

Behavioural theory also emphasizes that patient satisfaction and demand are influenced by deviations from a reference point. When expectations are low, even modest improvements in service quality can generate high satisfaction. Conversely, as expectations rise—typically in better-resourced facilities—patients become more demanding, which may depress SERVQUAL scores even when SARA scores are high.

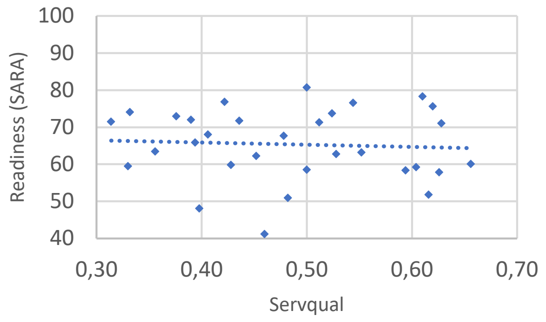
ii. Poor perceived quality leads to bypassing, delayed care, or forgone care. There is extensive evidence in rural Mongolia, well known to the authorities that it is not unusual for patients to bypass SHCs and seek care instead at inter-SHC facilities or, more commonly, at the aimag general hospital in the provincial capital. Others postpone care when they distrust local service quality, even at higher financial and opportunity cost. As a result, these patients tend to seek care when their condition has worsened—sometimes too late—leading to higher costs both for households and for the health system. This pattern was repeatedly highlighted during interviews with health-care teams conducted as part of the SHC efficiency assessment. Conversely, when perceived quality is high—particularly staff courtesy, clear communication, and reliable medicine availability—patients will exhibit, all else equal, a greater propensity to seek care at SHCs, higher willingness to pay for services, and a greater likelihood of returning for follow-up, as has been documented across West Africa, South Asia, and Latin American countries, where patients have been observed to choose more expensive or distant providers because they expect better interpersonal quality or responsiveness. These behaviours are common in all countries, regardless of their per capita income level (examples in Kruk et al., 2009; Hussien et al., 2022; Li et al, 2021; Rao, 2018).

iii. High efficiency can lead to a decline in perceived quality. For all the reasons discussed above, poor perceived quality will—ceteris paribus—negatively affect demand for care and thus efficiency. However, a high efficiency score can also adversely affect the subjective components captured by SERVQUAL, irrespective of SARA scores. Several mechanisms contribute to this: staff overload, longer queues or episodic congestion, insufficient financial and non-financial incentives to sustain staff motivation and engagement, work organisation that progressively diverges from demand, prioritisation of administrative productivity over patient-centred activities, and clinically relevant care protocols that are poorly understood by patients and thus interpreted as evidence of poor-quality care.

Incentives appear to play a particularly important role in shaping both efficiency and the efficiency–quality relationship for SHCs. As behavioural and institutional economics consistently show, health workers respond to their incentive environment, to which they respond provided that incentives, particularly financial ones, are correctly calibrated and adapted to local front-line contexts (Bonfrer et al., 2014; Mathonnat and Pelissier, 2017; Diaconu et al., 2021). When salary/revenue and career prospects are perceived as inadequate or demotivating—which is widely reported among SHC staff—when supervision is infrequent (particularly in remote SHCs located 50–100 km or more from the provincial regulatory centre), and when sanctions for under-performance are rare, the marginal benefit of extra effort becomes minimal. This generates classic moral-hazard behaviour, resulting in effort aversion and shirking. Patients perceive this as indifference or lack of empathy, which directly lowers SERVQUAL scores even when efficiency remains high. If staffing levels and other inputs remain unchanged, this situation is likely to lead, in the medium to long term, to a vicious cycle of declining activity, falling efficiency scores, and a perceived deterioration in quality of care.

iv. Perceived Quality and SARA capacity to deliver quality healthcare do not relate to Efficiency in the same way. This study finds a negative relationship between the main SERVQUAL dimensions and the SARA availability and readiness score. This aligns with several meta-analyses combining SARA assessments with patient-reported experience surveys, which consistently show that facilities scoring highly on SARA are not necessarily perceived more positively by patients. This is unsurprising, as the two tools do not measure the same construct.

Fig. 7. SERVQUAL Index and SARA-Readiness Index



SARA does not measure the quality of care delivered; it measures the facility's **capacity** to deliver quality care. The distinction between capacity to deliver quality care (SARA) and the actual delivery of quality care is well established in the literature (Alhassan et al., 2015; Leslie et al., 2017; Kruk et al., 2018; Macarayan et al., 2018; Maïga et al., 2025). This implies that high readiness and availability rarely translate into high perceived quality or into higher efficiency via increased demand.

Studies on the know–do gap reinforce this conclusion. They show a persistent divergence between providers' knowledge of correct clinical procedures and what they actually do in practice (Das and Hammer, 2014), even when all necessary resources (SARA) are available. Such behavioural slippage reflects low intrinsic motivation, inadequate incentives, supervision, and weak accountability rather than structural deficits.

Moreover, patients are unable to assess objectively the quality of the components included in SARA indicators. Structural readiness includes many elements invisible to them—sterilisation protocols, diagnostic capacity, drug inventories, and other back-office functions. Because patients cannot observe these technical dimensions, they substitute visible and affective cues for latent competence. When technical quality is opaque but provider empathy is concrete and tangible, perceived quality becomes mediated by relational and emotional dimensions (SERVQUAL) rather than by the facility's structural capacity to deliver high-quality care, as captured in SARA. Consequently, high SARA scores can coexist with poor patient experience, low SERVQUAL ratings, and low efficiency, as we observe for SHCs.

6. Recommendations for Supporting Policymakers to Align Efficiency and Healthcare Quality

We propose that the Ministry of Health address the following four interrelated issues.

i. Updating efficiency and quality metrics and broadening the sample. The data used in this study refer to 2018, and the situation may have changed considerably since then, particularly in light of recent government measures to introduce performance incentives and adjust the capitation formula. Updating the data is essential for improving understanding of the issues analysed here and for deriving sharp, operationally relevant policy actions.

In addition, the limited sample of 31 SHCs constitutes a strong constraint for the econometric methods that would be appropriate for this type of analysis. This study has highlighted correlations, or the absence of correlations, between efficiency, SERVQUAL and SARA indices. However, correlation does not imply causality. Conceptually, the relationship between SHC efficiency and quality-of-care indicators can be bidirectional, as discussed above. On the one hand, efforts to increase efficiency may inadvertently reduce perceived quality of care, whether this perception is accurate or not. On the other hand, low efficiency may result from organizational arrangements, practices, or staff behaviours that patients interpret as features of higher-quality care.

Methodologically, this suggests potential endogeneity between efficiency and quality indicators, which would normally call for the use of instrumental variables or mediation model—an approach that was not feasible here due to data limitations and the small sample size. Furthermore, we cannot rule out the possibility that the non-significance of the correlations between efficiency and the SARA indicators is partly driven by the restricted sample. Expanding the sample is therefore indispensable. All of this justifies the exploratory nature and the title of the document.

ii. Answering two critical questions. Answering the following questions is essential for designing measures that effectively align quality of care and efficiency:

- Do SHCs with high SARA indicators actually deliver objectively good-quality care? If not, why?
- What is the actual quality of care provided by SHCs with high efficiency scores, and by those with low efficiency scores?

These questions could, for example, be explored in greater depth by focusing on a small number of facilities, such as the five highest-performing and the five lowest-performing SHCs, and conducting targeted quality-of-care assessments, including focus groups with SHCs managers, provincial and central authorities.

iii. Consider efficiency drivers explicitly when analyzing quality issues and collect additional data. Notwithstanding the fact, noted above, that the data refer to 2018, simply updating them will not be sufficient to adequately inform decision-makers seeking to align efficiency and quality. Additional information on the determinants of efficiency is required.

For instance, the Efficiency Study found no clear relationship between efficiency scores and staffing levels across the 262 SHCs analysed, raising concerns about the criteria used for staff allocation. This finding has direct implications for how efficiency and quality should be considered jointly.

Consider, for example, a SHC with a high efficiency score but low perceived quality due to an inadequate number of medical staff or a high rate of absenteeism. Patients who are dissatisfied with the quality of care may forgo care or bypass the SHC by going directly to the aimag hospital or another provider. This behaviour reduces patient volume and may ultimately lower the SHC's efficiency score. At the same time, the decline in patient numbers may lead to real improvements in several dimensions captured by the SERVQUAL framework (Reliability, Responsiveness, Assurance, Empathy, Tangibles), thereby improving perceived quality. In turn, this perceived improvement may increase patient volume and efficiency, but potentially at the cost of a subsequent deterioration in perceived quality, creating a cyclical pattern. Conversely, having too many staff relative to potential demand may be perceived by patients as a sign of quality, but will undermine efficiency.

Moreover, the Efficiency Study showed that efficiency scores are influenced not only by endogenous factors but also by exogenous factors beyond SHC control, including population density, poverty headcount and the proportion of herders in the catchment population. Such contextual factors must be explicitly taken into account when balancing efficiency and quality and when designing performance frameworks or incentives.

iv. Promote systematic dissemination and use of analytical findings. Finally, broad dissemination of analytical results to all stakeholders—central and local health authorities, SHC managers and staff, and development partners—is essential for fostering better alignment between efficiency and quality in SHCs and other health facilities. Yet, as highlighted by Kumah et al. (2017), there is limited empirical evidence on how patient-experience data are actually used to guide quality-improvement initiatives. Strengthening the institutional mechanisms through which efficiency analyses, patient-reported experience measures (such as SERVQUAL), and readiness assessments (such as SARA) are fed back into decision-making and routine management is therefore a key component of any strategy aiming to reconcile efficiency objectives with quality-of-care goals.

Conclusion: Key Takeaways for Aligning Efficiency and Quality in SHCs

- ***Efficiency and quality do not move in lockstep.*** *Efficiency is often weakly or negatively correlated with both perceived quality (SERVQUAL) and structural readiness (SARA); the relationship can be bidirectional and context-dependent.*
- ***Perceived quality is a major driver of demand.*** *Patients' experience of care (respect, communication, waiting time, drug availability) strongly shapes utilization, bypassing, and forgone care—and therefore SHC efficiency.*
- ***Structural readiness is not actual care.*** *High SARA scores capture capacity, not the quality of care delivered or how it is experienced by patients; readiness does not automatically translate into higher perceived quality or efficiency.*
- ***Data and methods matter.*** *Updated data and a larger SHC sample are needed to move beyond simple correlations and address endogeneity between efficiency and quality (e.g. via instrumental-variable approaches).*
- ***Contextual factors shape efficiency–quality links.*** *Population density, poverty, and the share of herders affect both efficiency and quality and must be explicitly considered when designing performance frameworks and staff allocation.*
- ***Two critical questions remain unanswered.*** *Policymakers need evidence on (i) whether high-SARA SHCs actually deliver good-quality care, and (ii) the true quality of care in SHCs with high versus low efficiency scores.*
- ***Use what we measure.*** *Patient-experience (SERVQUAL), readiness (SARA) and efficiency results should be systematically fed back to SHC managers, frontline teams, planning authorities and used to guide targeted quality-improvement and incentive reforms for better efficiency.*

Appendix 1. Descriptive statistics

	Obs	Mean	Std. dev.	Min	Max	Median	Coef.
Technical efficiency	31	0,7332	0,0996	0,4997	0,9485	0,7517	13,59
SERVQUAL	31	0,4861	0,1011	0,3140	0,6560	0,4820	20,81
Reliability	31	0,5403	0,1743	0,2700	0,8400	0,5400	32,27
Assurance	31	0,4439	0,1661	0,2000	0,7400	0,4300	37,42
Responsiveness	31	0,4587	0,1338	0,2300	0,6500	0,4600	29,17
Empathy	31	0,4884	0,0493	0,3800	0,5700	0,4900	10,10
Tangible	31	0,4990	0,0446	0,3900	0,5700	0,5100	8,94
Service availability index	31	83,5599	11,7930	43,4100	96,1657	87,7996	14,11
Service readiness index	31	65,3624	9,5822	41,2656	80,7693	65,9131	14,66
Basic equipement index	31	59,0037	8,3394	42,0886	75,0000	59,4937	14,13
Diagnostic capacity index	31	61,1940	15,1525	34,3284	88,0597	61,1940	24,76
Essential medicine index	31	75,8895	12,4588	42,0000	96,9697	76,0000	16,42
Overall Outpatient service Utilization index	31	42,4263	17,8892	11,3831	81,1365	41,8571	42,17
Overall Inpatient service Utilization index	31	85,1827	23,8468	7,7882	100,0000	96,6240	27,99

Appendix 2. Correlation matrix

	Technical efficiency	SERVQUAL	Reliability	Assurance	Responsiveness	Empathy	Tangible	Service availability index	Service readiness index	Basic equipement index	Diagnostic capacity index	Essential medicine index	Overall Outpatient service Utilization index	Overall Inpatient service Utilization index
Technical efficiency	1.0000													
SERVQUAL	-0.8967*	1.0000												
reliability	-0.7594*	0.8734*	1.0000											
assurance	-0.8345*	0.9364*	0.7000*	1.0000										
responsiveness	-0.9039*	0.9420*	0.7337*	0.9061*	1.0000									
empathy	-0.7440*	0.8456*	0.6131*	0.7643*	0.8187*	1.0000								
tangible	-0.5543*	0.6740*	0.5068*	0.5918*	0.5310*	0.7810*	1.0000							
Service availability index	0.4020	-0.5763*	-0.4655*	-0.5646*	-0.4824*	-0.5563*	-0.5487*	1.0000						
Service readiness index	-0.0811	-0.0626	-0.0702	-0.0044	0.0577	-0.2841	-0.2770	-0.0225	1.0000					
Basic equipement index	0.1626	-0.1618	-0.1493	-0.1653	-0.1313	-0.1904	-0.0308	-0.1676	0.5608*	1.0000				
Diagnostic capacity index	-0.2012	0.0653	-0.0036	0.1293	0.1730	-0.0918	-0.1450	-0.1052	0.8768*	0.2471	1.0000			
Essential medicine index	-0.0513	-0.1154	-0.0578	-0.0568	0.0105	-0.4164	-0.4420	0.1882	0.8656*	0.3241	0.6415*	1.0000		
Overall Outpatient service Utilization index	0.2039	-0.2792	-0.2225	-0.2469	-0.2561	-0.2332	-0.3498	0.3705	-0.2262	-0.3185	-0.1602	-0.1140	1.0000	
Overall Inpatient service Utilization index	0.1309	-0.2874	-0.3193	-0.2553	-0.2241	-0.1808	-0.1871	0.5264*	0.1799	-0.0261	0.2566	0.1205	0.1513	1.0000

Appendix 3. Data - Group breakdown of SHCs

	Mean for Soums with TE<median	Mean for Soums with TE>=median	Wilcoxon-Mann-Whitney	Signific.
Technical efficiency	0,6565318	0,797309	0,0000	***
SERVQUAL	0,594	0,402	0,0001	***
reliability	0,68	0,415	0,0000	***
assurance	0,56	0,295	0,0000	***
responsiveness	0,59	0,345	0,0000	***
empathy	0,51	0,46	0,0009	***
tangible	0,52	0,485	0,1262	NS
Service availability index	85,27194	89,41028	0,0820	NS
Service readiness index	67,72205	64,70238	0,4768	NS
Basic equipement index	57,27848	60,44304	0,4643	NS
Diagnostic capacity index	67,16418	58,20896	0,1602	NS
Essential medicine index	78,78788	75,87879	0,4281	NS
Overall Outpatient service Utilization index	39,18429	47,11804	0,6073	NS
Overall Inpatient service Utilization index	91,3242	96,79468	0,5476	NS

	Median for the 10 least efficient SHCs	Median for 11 average efficient SHCs	Median for the 10 most efficient SHCs	Kruskal-Wallis test	Signific.
Technical efficiency	0,6320	0,7517	0,8325	0,0001	***
SERVQUAL	0,6130	0,4820	0,3960	0,0001	***
reliability	0,7550	0,4400	0,4500	0,0001	***
assurance	0,6450	0,4300	0,2800	0,0001	***
responsiveness	0,6100	0,4600	0,3250	0,0001	***
empathy	0,5250	0,4900	0,4350	0,0009	***
tangible	0,5250	0,4900	0,4650	0,128	NS
Service availability index	81,0259	88,0086	89,4103	0,082	*
Service readiness index	61,4652	71,3170	64,7024	0,4768	NS
Basic equipement index	56,8038	59,8101	60,2848	0,4646	NS
Diagnostic capacity index	58,9552	65,6716	58,9552	0,1605	NS
Essential medicine index	72,7273	80,3030	78,9091	0,4292	NS
Overall Outpatient service Utilization index	39,1339	39,1843	47,1180	0,6073	NS
Overall Inpatient service Utilization index	87,9107	100,0000	96,4115	0,5665	NS

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