

Systemic factors affecting the technical quality of healthcare in results-based financing in Burkina Faso.

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Abstract

Background:

In the implementation of the results-based financing (PBF) strategy in Burkina Faso, there is heterogeneity in the performance of technical quality of healthcare in basic healthcare facilities. This study aims to identify the factors that may explain this heterogeneity.

Methods:

We carried out a quantitative study in 30 basic public health facilities, thirteen of which have a quality score greater than or equal to 50% and 17 of which have a quality score less than 50%. Data from their profiles were collected using a direct observation grid. A total of 94 health professionals answered a series of semi-structured questions.

A bivariate analysis using the Chi-square test and a multivariate analysis using the multiple regression model were used.

Results:

The difference is statistically significant in favour of health facilities with good performance in technical quality in terms of health infrastructure (p=0.020), health equipment (p=0.004) and compliance with norms and standards in terms of health personnel (p=0.004).

The variables used in the multiple regression model are ongoing training (p=0.000), internal communication (p=0.000) and financial motivation (p=0.003) of health professionals.

Conclusion:

These results suggest that the effectiveness of the technical quality of healthcare in implementing the PBF depends on certain basic conditions in the health facilities, such as the presence of infrastructures, equipment and human resources that meet established norms and standards and the managerial dynamics of healthcare workers.

Background

Maternal, infant and child mortality remain major public healthcare problems in numerous developing countries, particularly those located in Sub-Saharan Africa. In fact, according to Gaimard. M. (1), 162,000 women die in the region annually due to pregnancy-related causes, following childbirth and in the post-partum period. In this region, the risk of maternal death is 1 in 16 compared with 1 in 3800 in the world's developed countries.

According to Unicef (2), the region is also home to the highest infant mortality rate in the world for children under five with one child out of 12 dying before his or her fifth birthday, which is 12 times higher than the

average of 1 out of 147 in the highest income countries.

According to Hat et al (3) this situation is down to women's limited access to maternal and infant health services given their high costs as well as an inadequate quality of care. RBF were adopted in 1990 with a view to reducing this high mortality rate. Goals 4 and 5 targeted the reduction of infant mortality and the improvement of maternal healthcare, respectively.

The introduction of international strategies and initiatives brought about a 41% reduction in maternal mortality in Sub-Saharan Africa (4) and a 45% drop in the infant mortality rate between 1990 and 2012, (5).

Notwithstanding these encouraging results, there are numerous countries in Sub-Saharan Africa at risk of failing to meet the MDGs. To achieve these goals, these countries must increase the accessibility and quality of maternal and infant health services.

For Kathleen N (6), a promising means of improving the access to and quality of maternal and infant health services is by making performance-based payments to healthcare suppliers. For Basinga P (7), these programmes provide healthcare service providers with financial incentives in order to improve the use and quality of specific healthcare indicators.

Known as Performance-Based Financing (PBF) or Results-Based Financing (RBF), they have thus been developed throughout several African countries with compelling results where improvements to the quality of maternal and infant healthcare are concerned. Basinga P et al (7) reported that in Rwanda, the introduction of RBF led to a significant upturn in the quality of antenatal consultations for pregnant women and the administering of the tetanus vaccination at intervention sites in comparison with control sites.

The noteworthy example of Rwanda paved the way for other countries to trial the use of performance-based financing with equally compelling outcomes.

Soeters R et al (8) reported that in the RBF there was an improvement in the perceived quality of care among patients attending health facilities which had adopted RBF versus those with access to control health facilities.

Huntington D et al (9) showed that in Egypt, the quality of family planning and antenatal consultations was better in facilities which had been subject to performance-based incentives when compared with control facilities where fixed salary bonuses had been provided.

In Burkina Faso, the results of the demographic health survey carried out by the National Institute of Statistics and Demography (NISD) indicated that in 2010 (11) there was an infant and child mortality rate of 129 per 1000 and a maternal mortality rate of 341 per hundred thousand. This meant that in 2015 the country risked failing to achieve the MDGs.

Furthermore, with the benefit of the African trials concerning the implementation of performance-based financing, with the technical and financial support of the World Bank (WB), the country introduced results-based financing (RBF) in order to improve the use and above all the quality of maternal and infant healthcare. One year after this introduction, the report analysing the results of a RBF evaluation of healthcare quality (11) showed widely varying performances with regards to the technical quality of healthcare within basic health facilities. The lowest healthcare technical quality score was 13.84% whereas the highest was 94.82%. Also, out of the 568 basic health facilities evaluated, 15% gained a technical quality score below the minimum of 50% required to quality for a quality bonus.

Addressing the root causes of such a situation is essential if the aims of RBF are to be realised.

The majority of studies are focussed on evaluating the effects that introducing financial incentive programmes has on improving the quality of health services, and not the factors which enable or hinder health facilities from achieving these quality results.

This study therefore aims to plug that gap by determining the systemic factors which enable the delivery of quality healthcare within basic health facilities in a context of the implementation of results-based financing.

Methods

Burkina Faso is a country located in Western Africa within the Bend of the Niger, it has geographic coordinates of 9° 20′ and 15° 5′ north latitude, 2° 20′ east longitude and 5° 30′ west longitude. The healthcare system is organised around health districts. There is a total of 70 health districts spread across 13 health regions.

The provision of healthcare is organised around the district hospital which represents the reference point for health and social promotion facilities. According to the health statistical yearbook (12), in 2013 healthcare was provided in 2371 health facilities 84% of which were public health facilities. Among these public facilities, 95% were basic health facilities, among which there figured 1606 health and social promotion facilities (CSPS).

The results obtained by these health facilities show a low uptake of maternal health services. In fact, only 28.5% of pregnant women had been to at least 4 antenatal health appointments, 80.5% of births were in the presence of a qualified healthcare professional and 35% of women who had given birth received postnatal care. The use of modern contraception was 32.4%.

The country opted to introduce RBF in order to improve these indicators.

Results-Based Financing (RBF)

According to the national guide on the implementation of results-based financing in the health sector (13), RBF is defined as a results-oriented approach to the health system aiming to quantitatively and

qualitatively improve the provision of care via contractual methods. This is done by means of a performance contract stipulating that financial resources will be distributed to service providers as a reflection of the quantity of services delivered which adhere to previously defined indicators as well as rules and quality standards for services and care. It was first introduced in 2011 in three pilot health districts (Boulsa, Léo and Titao) with a view to improving the use and quality of care and maternal and infant health services. Following the success of this test phase, and with the technical and financial support of the World Bank, this pilot project was then expanded to twelve other health districts in 2013, carrying the number to fifteen health districts spread across six health regions. This then meant it covered 4,447,113 inhabitants (25.7% of the country). There were 644 first level health facilities, 13 district and 4 regional hospitals involved (ibid.)

The payment of financial resources to health facilities was based on the quantity and quality of care and services provided. This also followed verification of the results achieved. The quantity was verified every month by RBF a process which involved ensuring the accuracy of the quantity of services declared by the health facilities.

The technical quality of services within basic health facilities was verified by members of the Health District's Management Team. This involved the use of sample groups and direct observation to ensure that delivered services satisfied governing quality norms and standards. A pre-established quality checklist was adopted in this respect. This process was complete once the quantity had been verified. Verification was based on an evaluation of working conditions, the availability of resources and materials, the upkeep of data collection tools, financial management, health facility hygiene and sanitation and adherence to quality norms and standards regarding the healthcare services provided by health professionals (Annex 1).

At the conclusion of this verification process, a technical quality score ranging from 0 to 1 depending on the quality delivered by the health facility team is determined. The bonus to be granted to the health facility can then be calculated in addition to the quantities produced, when the score is at least 50%.

These financial resources are provided to health facility teams in order to improve facilities and equipment, to motivate personnel and to finance all operational activity aimed at bringing about quantitative and especially qualitative performance gains. To do so, each health facility is required to draft a quarterly RBF with a view to addressing the shortfalls identified during the various verification processes and improving the quality of care, services and their use.

Study design

Quality of care is a multi-dimensional concept. According to Avedis Donabedian (14), it can be evaluated on two levels. At a structural level, where the aim is to determine whether or not there are sufficient means, be they human or physical resources, and then on a procedural level where practices are assessed and are compared to recommended standards, those being both professional as well as organisational practices.

Addressing the causes of any failure for the technical quality of care to improve comes down to determining the factors linked to the health facilities and the health professionals that can influence the improvement of the technical quality of care. This assumes that there are factors connected to the health facilities and health professionals involved in the implementation of RBF which influence the improvement of the technical quality of health care. (Fig. 1).

For the purposes of verifying these hypotheses a study was carried out in the Burkina Faso health districts implementing RBF. This study was performed on a quantitative, cross-sectional basis. It was undertaken in health districts which were selected using purposive sampling. These health districts began RBF in December 2013 and are home to health facilities with either a technical quality of care score of under 50% or a score equal to or greater than 50%. The health facilities in question were public health facilities where there was a dispensary and a maternity unit. They were divided into two strata reflecting the two aforementioned score levels. Their number within each of the strata was determined by means of Neyman optimal allocation via the formula: $nh = k*n*\sigma h$, where

- nh is the sample size within a stratum;
- n = the sample size;
- $\sigma h = the stratum variance standard deviation$
- $k = the Neyman coefficient and <math>k = n / (n * \sigma 1 + n * \sigma 2)$.

In each stratum, a random sample with equal probabilities was used to select the health facilities where data was to be collected. In these facilities, non-trainee health professionals who had been working in health facilities since RBF was initially implemented were selected for interview, either specifically or at random.

Data collection.

Data used in this study come from the health facilities visited and from the health professionals interviewed during the survey. They were collected by five investigators external to the health services recruited and trained.

We used two tools to collect data. Firstly, an observation grid was used to do a direct observation enabling an evaluation of the extent to which Burkina Faso Ministry of Health norms and standards for health and social promotion facilities were adhered to concerning facilities, equipment and health personnel.

Secondly an oral questionnaire was used to collect data on the managerial dynamics of health professionals working in health facilities since the start of RBF, present on the day of the interview and who agreed to participate in the study.

A preliminary test of these tools was done by the Judges' method and in Solenzo Health District which is involved in RBF implementation but was not part of the sample

Statistical analysis

The dependent variable is the improvement to the health facility's technical quality of care score. Health facilities with a technical quality of care score below 50% are considered to have a "low performance" and those with a technical quality of care score equal to or greater than 50% a "good performance".

This dependent variable was coded according to a system where health facilities performing poorly in terms of the technical quality score were given "0" and those performing well where the technical quality score is concerned received a "1".

The independent variables which would influence this variable concerning basic health facilities were the availability of infrastructures, equipment and the presence of personnel in compliance with required norms and standards of Ministry of health.

With regards to health professionals, the independent variables used were those of ongoing training, the organisation of services, activity planning, internal communication, workplace motivation and financial motivation.

As independent variables were qualitative variables, they were transformed into quantitative variables. So, the rating of different responses to the questionnaire and outcomes of the direct observations where was be made. This was done by giving every positive response (Yes) a score of 5 points and every negative response (No or Don't know) 0 points. For questions with more than two categories of answer, the first positive category was scored to 5 points, the second to 3 points, the third to 1 point and the final category to 0 points.

Points were then totalled for each independent variable and each health facility, irrespective of its group (good or poor performer). The maximum possible number of points per independent variable was also calculated. On the basis of the number of points gained per independent variable, health facilities were placed into two categories, those having a "good level" for health facilities which gained an above average number of points out of those on offer, or a "low level", when the number of points for the facility's independent variable was below the average number of total points on offer.

Bivariate analysis was done as a means of identifying the link between the presence of resources satisfying the norms and standards and the technical quality of care score level. The Chi-squared test was used to evaluate the statistical significance of the observed difference.

Multivariate analysis using multiple regression models was used to evaluate the effect of variables connected to health professionals on the improvement of the technical quality of care score. The threshold for statistical significance was set at 0.05. SPSS software, version 20 was used for the analysis.

Ethical considerations

Throughout this study, the anonymity of all respondents and the confidentiality of their answers was carefully assured. Prior to the collection of data in selected health facilities, the written authorisation of the concerned regional health directors was obtained. Involvement in the study was voluntary and respondents provided their clear verbal consent before each interview.

Results

Sample's description

Under the terms of the study, five health districts were visited (Nouna, Koudougou, Ouahigouya, Kongoussi and Tenkodogo) out of the fifteen where RBF was introduced. In these health districts, effective data collection was carried out in thirty (30) basic public health facilities due to 6 per health district. The majority (90%) of them were in rural settings. Having regard to technical score ,17 had a technical quality score below 50% and 13 facilities had on equal to or greater than 50%.

In total, (Table 1) 94 health professionals were interviewed, in other words 64% of all staff in the visited health facilities. There was an equal distribution of these individuals throughout the two groups of health facility. The individual characteristics (annexe 2) show that male individuals (53.2%), those aged 35-40 (29.8%) and married people (55,3%) were in the majority. In terms of the level of training and professional qualifications, we saw that those who had completed the second cycle of secondary education (56.4%) and assistant midwives (27.7) followed by State nurses (23.4%) were in the majority. The majority (69%) had over 4 years professional experience.

Results of the bivariate analysis.

The results of the bivariate analysis show that health facilities with good performances possessed more infrastructures, equipment and personnel than required under governing norms and standards. Where infrastructures were concerned, there was a statistically significant difference (p= 0.020) between health facilities with good performance (60%) and those with low performance (40%). With regards to health equipment, the difference between health facilities with good performance (69%) and those with low performance (31%) is statistically significant (p=0.004). Lastly, concerning the presence of sufficient personnel to meet governing norms, the difference is statistically significant (p= 0.004) between the health facilities with good performance (80%) and those with low performance (20%).

Results of the multivariate analysis.

The employed linear regression model focussed on identifying variables associated with improving the technical quality of care score. The independent variables tested in this model were ongoing training (ONG_TRAINING), the organisation of services (SERVICE_ORG), activity planning (PLANIF), internal communication (COMMUNIC), workplace motivation (WORK_MOT) and financial motivation (FINAN_MOT) The entry method was adopted.

The results (table2) show that there was a heightened level of variance explained by the model (R^2 =0.639). The related test F showed that the model was generally significant, F = 27.272 with a critical probability (p-value) significantly below the threshold of 1%.

The variables with a significant bearing on any improvement to the technical quality of care score retained by the model (table 3) were ongoing training (p=0.000), internal communication (p=0.000) and

the financial motivation of health professionals (p=0.003).

Discussion

The results of the study have shown that the health facilities with good performances had more facilities and health equipment in comparison with governing norms and standards. The facilities in these facilities consisted of a dispensary with a head nurse's office, a waiting room and others for consultations, care and minor surgery, hospitalization as well as separate toilets. The maternity unit consisted of a waiting room, a consultation room, a 2-bed ward, a 5-bed delivery and post-natal care ward and separate toilets. There were at least 3 accommodation units for personnel, a medication outlet, a vaccination room and a shop. These premises were in a good condition, equipped with running water and lighting. They were equipped with office furniture as well as the medical and technical material required to provide good-quality care. The same observation was made by Mosadeghrad (15), when he stated in his study that "High-quality results require high-quality input". Bertrand D (16), confirmed this by stating that "the second dimension of the quality of care is represented by the quality of facilities used in the health system".

This illustrates the need for these facilities to have high-quality health facilities and equipment in order to be able to offer high-quality care. The results of the study have also shown that health facilities with good performances had more personnel, compliance with governing norms. Within their dispensary, these facilities had at least one State nurse, a junior nurse and a community health agent. In the maternity unit, there was at least one State midwife and an auxiliary midwife. In addition to these health professionals, there was a medication outlet manager, a security guard to safeguard material assets and a cleaner. All of which corroborates the results gained by Mosadeghrad (15), who believed that "The quantity and quality of healthcare staff affects the quality of services. High-quality carers are essential if high-quality results are to be achieved". This shows that the quantitative and qualitative presence of human resources is critical for the provision of quality care.

However, the sole availability of adequate resources does not guarantee high-quality care. High-quality care can be provided even in environments with very limited resources. For Supratikto (17), in Indonesia, 60% of all perinatal deaths were attributed to substandard procedures and only 37% to economic constraints. In other words, health facilities with good performances had the necessary but inadequate conditions for the provision of high-quality care.

The study results showed that there were factors connected to health professionals which influenced the improvement of the quality of care. Among which, featured the ongoing training of health professionals. Health professionals in health facilities with good performances benefited from more ongoing training, enabling them to offer care which satisfied governing norms and quality protocols. They received ongoing training on RBF, the use of the diagnosis and treatment guide (DTG) and common illnesses. They have also been trained in the use of a partograph for assisted deliveries, the integrated management of childhood illness (IMCI) strategy, prenatal care (PC) and family planning (FP).

This supports the results obtained by Mosadeghrad (15) according to which "Training professionals has a very powerful and positive effect on social capital.[...] The quality of health services primarily depends on the knowledge of practitioners and their technical skills"

The effects of training on the improvement of the quality of care have been reported elsewhere. For Bitwe R. et al (18), training professionals brought about improved diagnoses and prescription leading to an overall reduction to mortality from 15.9%, prior to intervention to 4.6%, following the intervention. Pour Molyneux E et al. (19), training allowed for the delivery of care to be streamlined and hospital mortality to be reduced from a level of 10–18% prior to training to 6–8% following the intervention in Malawi. Lastly, Ashworth A et al., (20), showed that in South Africa, training enabled a reduction to the mortality of children suffering from malnutrition from 46% prior to the intervention to 21% after the training.

All of which goes to show that training health professionals is a fundamental part of improving the quality of care, making it vital to improving the technical quality of care.

The study also showed that internal communication was linked to improving the quality score. Professionals in health facilities with good performances shared more information about developments and the results of the health facility service quality evaluation during ordinary and extraordinary meetings. This enabled them to share information on progress made and the challenges that lay ahead in terms of the technical quality of care within the health facility. This supports the results obtained by Mosadeghrad (15), according to which "The capacity of practitioners to communicate and collaborate effectively with other health professionals or institutions was also seen as essential [...] Good communication, cooperation and collaboration between health care providers enabled effective and efficient health services and promoted shared responsibility for patient care". Bertrand (16) considered it to be the "decisive factor for the successful improvement of the quality of care".

The study lastly revealed that the financial motivation of health professionals was also linked to the improvement of care quality. Carers in health facilities with good performances were most likely to receive performance bonuses, to recognise that these bonuses reflected their achievements and expectations and to have invested these bonuses. For professionals, receiving bonuses contributed to the improvement of the quality of care as it encouraged them to offer more quality services in order to maximise their own economic capital. Which supports Mosadeghrad's results, (15) according to which "Employees achieved the best results when they reaped the rewards of their efforts". The same is true for Minvielle (21), who stated that "In the United Kingdom in 2004, a 75% target for care quality and safety drawn up by the National health service (NHS) for family doctors received wholehearted support, even among doctors who had achieved 97% of the stipulated quality targets, when a financial incentive in the form of bonuses and rewards was suggested". This is corroborated by Richard A (22), who pointed out that, "in the USA in hospitals where a bonus of 1 to 2% was offered to achieve higher performance levels in relation to one's peers, greater quality improvements were identified over a two-year period in comparison to hospitals without any financial incentive". All of which confirms that financially motivating health facility workers influences improvements in care quality.

Several specific lessons can be taken from this study. The introduction of an RBF programme to a context of a predominantly public provision of care means health facilities require structural resources (facilities, equipment and health personnel) which meet governing norms and standards. In truth, providing resources to health facilities only enabled repairs to existing resources and not the acquisition of new ones where necessary. Regarding health professionals, their knowledge and skills must be reinforced with regards to governing norms and health protocols, effective internal communication and the provision of performance-based bonuses are also required.

Our study was subject to certain limits. Despite the small number of facilities included in the study we have brought to light factors which affect the improvement of the quality of care within the context of an introduction of RBF. Recall errors among the respondents and the fact that interviews took place in health facilities could have undermined the accuracy of the provided answers. Nevertheless, we believe that such errors would have affected both groups of health facilities equally.

Conclusion

This study enabled illustration of the fact that improving the quality of care is a multi-faceted undertaking. On the one hand, it is ultimately affected by factors linked to health facilities such as the availability of facilities and health equipment which meet governing norms and standards as well as the presence of personnel in accordance with required norms. On the other hand, it is dependent on factors linked to health professionals such as ongoing training, communication and financial motivation, which suggests that at the point RBF is introduced there is a need for basic investment where health care is predominantly provided by the public sector, for the technical quality improvement of health care.

Abbreviations

PBF

Performance-Based Financing

RBF

Results-Based Financing

IMCI

Integrated Management of Childhood Illness

PC

Prenatal Care

FP

Family Planning

NISD

National Institute of Statistics and Demography

Declarations

Ethics approval and consent to participate

The study has been approved by the Ministry of Health and received the approval of the Ethics Committee for Health Research. All study participants received written and oral informed consent

Consent for publication

Not applicable. Information within this manuscript does not contain personal identifiers

Availability of data and materiel

The dataset supporting the findings of this study is available on request from the Corresponding author.

Competing interests

The authors declare that they have no competing interests. All authors listed on the

manuscript contributed to the study design, data collection, data analysis and interpretation of the findings, and drafting and reviewing the final manuscript.

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Authors' contributions

All authors participated in the study design. ZZ and AB collected and analyzed the data and AS and SS participated in the writing of the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1: Individual Characteristics of Surveyed Health Professionals

Individual characteristics	Low performance health facility	High performance health facility	Together
Sex			
Female	25.5%	21.3%	46.8%
Male	24.5%	28.7%	53.2%
Age group			
20-25 years of age 25-30 years of age 30-35 years of age 35-40 years of age 40-45 years of age 45-50 years of age 50-55 years of age Marital status	3.2% 9.6% 10.6% 19.1% 6.4% 0.0% 1.1%	1.1% 9.6% 17.0% 10.6% 6.4% 4.3% 1.1%	4.3% 19.1% 27.7% 29.8% 12.8% 4.3% 2.1%
Single Married Education level	19.1% 30.9%	25.5% 24.5%	44.7% 55.3%
Lower secondary education Upper secondary education Superior Occupational Category	23.4% 24.5% 2.1%	13.8% 31.9% 4.3%	37.2% 56.4% 6.4%
State Nurse Midwife/State Clerk Licensed Nurse Patented Birth Attendant Itinerant Health Worker Auxiliary Birth Attendant	10.6% 2.1% 8.5% 1.1% 9.6% 18.1%	12.8% 9.6% 5.3% 1.1% 11.7% 9.6%	23.4% 11.7% 13.8% 2.1% 21.3% 27.7%
Seniority in the			
profession			
1-4years	14.9%	16.8%	30.9%
4 years and over	35.1%	34.0%	69.1%

Table2: Template Summary

Model	R	R-two	R-two	Standard	Change in the statistics				
			adjusted	error of	Variation in	Variation	ddl1	ddl2	Sig.
				estimate	R-2	of F			Variation
									of F
1	,808a	,653	,629	306	,653	27.272	6	87	,000

a. Predicted values: (constants), ONG_TRAINING, WORK_MOT, PLANIF, COMMUNIC, ORG_SERV, FINAN_ MOT_

Table 3: Coefficients

M	odel	Non-sta	ndardised	Standardized	t	Sig.	95.0% %	% confidence
coefficients		coefficients			intervals for B			
		A	Standard	Beta			Lower	Upper limit
			error				terminal	
1	(Constant)	1,490	153		9.757	,000	1,187	1.794
	PLANIF	012,012	,049	,017	,255	,799	-,085	110
	SERVOORG_	,189	111	119,119	1,699	,093	-,032	410
	COMMUNIC	-,280	,052	-,372	-5.404	,000	-,383	-,177
	WORKIMOT	-,005	,052	-,006	-,097	,923	-,109	,099
	FINAN MOT_	-,138	,046	-,230	-3.019	003	-,229	-,047
	ONGITRAINIG	-,278	,045	-,477	-6.166	,000	-,368	-,189

a. Dependent variable: performance level

Figures

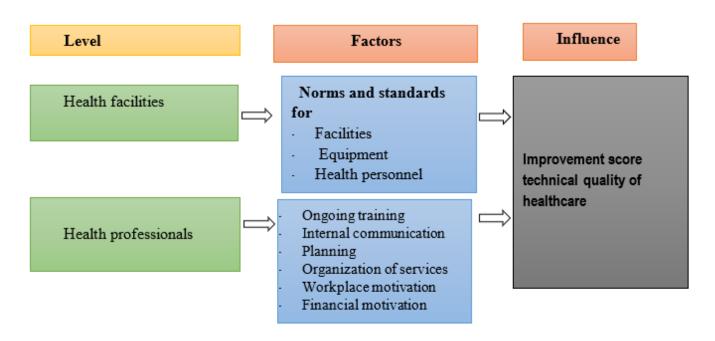


Figure 1

Conceptual framework of factors connected to the improvement of the technical quality of care.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- grilleobservation.docx
- QuestionnaireECDtraduit.docx
- QuestionnaireCOGES.docx
- Questionindividuel.docx