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(Research Article)

Evaluation of pricing methods and its impact on accessibility to care in public hospitals: Cases of the Makiso and Mangobo General Reference Hospitals from 2019 to 2021

Gabriel Omari Asaka *, Obed Kasereka Kaniki and Raymond Assani Ramazani

Department of Health Organization Management at the Higher Institute of Medical Techniques of Kisangani, DR Congo.

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Abstract

Introduction: In the Democratic Republic of Congo, there are two types of pricing for medical care in hospitals: Flat Rate Pricing and Pricing per Act. This study focuses on the evaluation of pricing methods and its impact on accessibility to care in public hospitals. This study specifically aims to determine the pricing method that allows the GRH/Makiso and the GRH/Mangobo to maximize revenue.

Methodology: This is a retrospective analytical study, conducted over a period of three years, i.e. from 2019 to 2021, and which concerned the maximization of revenues in the General Reference Hospitals of Makiso and Mangobo. The documentary analysis allowed us to collect the data and the use of average and percentage calculations made it possible to analyze the data. The comparison of the results was certified by the Chi2 test at the threshold of 0.05.

Results: The annual revenues produced by the Pricing per Act at the GRH/Mangobo from 2019 to 2021 are relatively lower than the annual revenues generated by the Flat Rate Pricing at the GRH/Makiso, i.e. respectively, 129,013,100.00 FC, compared to 706,501,460.00 FC. Finally, it is the Flat Rate Pricing which is advantageous for the hospital in being able to maximize revenue.

Conclusion: The Congolese State is obliged to finance the health system accordingly to allow public hospitals to operate efficiently. It is therefore up to hospitals to choose the type of pricing that allows them to generate revenue.

Keywords: Evaluation; Flat rate pricing; Per procedure; Maximization; Revenue; Public hospitals

1. Introduction

The hospital sector is in constant motion. Techniques evolve, care improves, the hospital structure adapts to new health care requirements and patient expectations. The notable developments in recent years are the mergers which have led to an increase in scale, the reorientation of hospital financing, the structuring of hospital activity through care programs, the reduction in the length of stay at the patient hospital [1].

To function better, the company is made up of a certain number of functions, in particular: the supply function, the production function, the technical function, the administrative function, the financial function, etc. The main role recognized for the latter is the search for the necessary funds and the optimal allocation of these, with a view to better profitability, both economic and social [2].

* Corresponding author: Gabriel Omari Asaka

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It is the same for a hospital which, to function better it needs the necessary financial resources which must be used rationally in order to achieve the objectives previously assigned, not to maximize a profit, but to provide quality care to the patients.

From colonial times until recent times, the health systems of most developing countries were characterized by being completely free for users. Despite the increase in health needs, there is a decline in health spending due to the economic crisis and pressures on public spending [3].

Faced with the difficulties of financing health services and in particular that of meeting operating costs, free health services are gradually being called into question. Already before the 1980s, countries such as Ivory Coast or Senegal had adopted official texts on the pricing of care. Initially, the establishment of payment for care by users corresponds more to a disengagement of the State rather than 'to the introduction of policy changes aimed at a more rational use of resources [4].

This is how, on the one hand, healthcare establishments have a continual tendency to raise prices in order to optimize as much as possible of the revenue necessary for their operation. On the other hand, this price increase only favors the exclusion of the population from accessing care. Ultimately the financial profitability of revenues in health institutions becomes [5].

In any organized country, the health system is governed by regulatory texts which establish the organizational, structural and practical provisions. In recent years, the health system of the Democratic Republic of Congo has suffered the consequences of the relaxation of state authority, anarchy and non-compliance with established rules. In order to rebuild the health system of this country, the Ministry of Health developed the health system strengthening strategy [6].

The Democratic Republic of Congo has not escaped this reality. This is how in the health system strengthening strategy (SRSS) adopted in 2006, flat rate pricing per episode of illness was recommended at the Makiso/Kisangani General Reference Hospital [7].

The literature on hospital economics identifies numerous factors that can generate differences in costs between establishments at the same level of efficiency. The size of the establishment and its range of activities, the quality of care, the difference in the characteristics of the patients treated and in the production factors are recognized as factors contributing to explaining variations in costs between establishments [8]. It should also be noted that prices (pricing per procedure and flat rate) must be adjusted as best as possible to take into account these factors, which are not always controllable by public establishments but which still have a direct impact on costs [9].

All these problems linked to the pricing of health care in DR Congo are characterized by the disengagement of the government, the insufficiency of budgetary resources allocated to health by the State, the insufficiency of funding granted by communities to health, the weak mobilization of internal and external resources, the delay in the disbursement of financial resources, the poverty of the population (low membership of the population in mutual health insurance, etc.), and in health insurance, the slowness in the implementation place of a social health fund, the weak development of mutual health insurance, etc. [10].

Africa is particularly concerned by this situation but very quickly faced with rapid demographic growth and a weak operating purchasing power, the determination of the prices of medical procedures constitutes a big problem in the financial management of hospitals. because of the tools to be implemented and the amount of work it involves. Thus, poorly adjusted payment policies negatively affect accessibility to hospital care or compromise the quality of medical service or even lead to unnecessary care to the detriment of the community. This seems to be even more essential in the context of the Congolese hospital system in general and in the public hospitals of Kisangani, in particular [11].

Generally speaking, this study aims to analyze the type of pricing that makes it possible to maximize revenue in public health establishments, in this case the Makiso General Referral Hospital (GRH) and the Mangobo General Referral Hospital.

Specifically, we set ourselves the objective of determining the pricing method that allows the GRH/Makiso and the GRH/Mangobo to maximize revenue.

2. Material and method

2.1. Materials

The General Reference Hospitals of Makiso and Mangobo in the city of Kisangani constitute our field of investigation. As part of this study, we were interested in these two hospitals since they served as an internship location for us during our training in Health Institution Management.

2.1.1. The Mangobo General Reference Hospital

This health establishment is located in Kisangani, capital of the Tshopo Province, located in the Limanga District, Block Mituku, n°8, in the Mangobo commune.

From a geographical point of view, the GRH/Mangobo is limited to the East by the Tshopo Commune, to the West by the Marie-Antoinette National Orphanage, to the North by the Methodist Protestant Church and to the South by the Church Protestant 5th CELPA. The Mangobo General Reference Hospital is located in the Mangobo Health Zone which covers an area of 306 km² with an average demographic density estimated at 539,158 inhabitants.

2.1.2. The General Reference Hospital Makiso/Kisangani

It is located in Kisangani, capital of the Tshopo Province, located in the Medical Plateau district, located on avenue Abbé Munyororo, No. 245/15 in the Makiso commune.

From a geographical point of view, the General Reference Hospital of Makiso is limited to the East by the Higher Institute of Commerce of Kisangani, to the West by the Prince Alwaleed Ben Saoud Reference Health Center, to the North by the Cemetery of victims of the six-day war and to the South by the Provincial Health Division and a little further, the University Clinics of Kisangani.

Located in the Makiso Health Zone, the Makiso General Reference Hospital covers an area of 624 km² with an estimated population density of 1,617,474 inhabitants.

2.2. Population and sample

The study population consisted of all revenues maximized by the two hospitals under examination, i.e. GRH/Makiso and GRH/Mangobo during the study period and according to the type of pricing used. .

We thus selected an exhaustive sample based on the numerical data recorded in the two General Reference Hospitals subject to this study over the course of three years, i.e. from 2019 to 2021.

2.3. Methods and techniques

2.3.1. Type of study

This is a retrospective analytical study, conducted over a period of three years, i.e. from 2019 to 2021, and which concerned the maximization of revenues in the General Reference Hospitals of Makiso and Mangobo.

2.3.2. Data collection technique

The documentary technique allowed us to collect data, guided by a pre-established data collection sheet. This involves consulting the financial situation sheets, the financial reports for a period of three years, i.e. 2019 to 2021, in each of these two institutions under study.

2.3.3. Data processing technique

The numerical data that we collected were grouped in the tables for analysis and the processing of these data was made possible thanks to the Pearson Chi-square test with a significance threshold of $P<0.05$. We also used the percentage calculation in determining the differences.

3. Results

The results concern the revenue generated by Pricing per Act and Flat Rate Pricing. It should be noted that the two health establishments each use their own pricing method, that is to say flat rate pricing at the GRH/Makiso and pricing by procedure at the GRH/Mangobo.

3.1. Evolution of annual revenues (in Congolese Francs) produced by Flat Rate Pricing at the GRH/Makiso and the Pricing per Act at the GRH/Mangobo

Table 1 Revenues generated by the GRH/Makiso and the GRH/Mangobo from 2019 to 2021

Periods	GRH-Makiso/Flat Rate Pricing		GRH-Mangobo/Pricing per Act		Annual Deviations
	Amount	Deviations	Amount	Deviations	
2019	209,085,870	-	33,656,050	-	175,429,820
2020	215,650,490	6,564,620	45,370,550	11,714,500	170,279,940
2021	281,765,100	66,014,630	49,986,500	4,615,950	231,778,600
Total	**706,501,460**	**72,579,200**	**129,013,100**	**16,330,450**	**577,488,360**
Average	**235,500,486.66**	**-**	**43,004,366.66**	**-**	**-**

Looking at this table, we note that the annual revenues produced by the Flat Rate Pricing at the GRH/Makiso have evolved upwards with a high amount of revenues estimated at 281,765,100.00 FC in 2021 out of a total of 706,501,460.00 FC with an annual average estimated at 235,500,486.66 FC. On the other hand, the annual revenues generated by the Pricing per Act at the GRH/Mangobo had also increased with a higher amount in 2021, i.e. 49,986,500.00 FC out of a total of 129,013,100.00 FC with an annual average of 43,004,366.66 FC.

We illustrate in graph no. 1 the evolution of annual revenues generated by the GRH/Makiso and the GRH/Mangobo from 2019 to 2021.

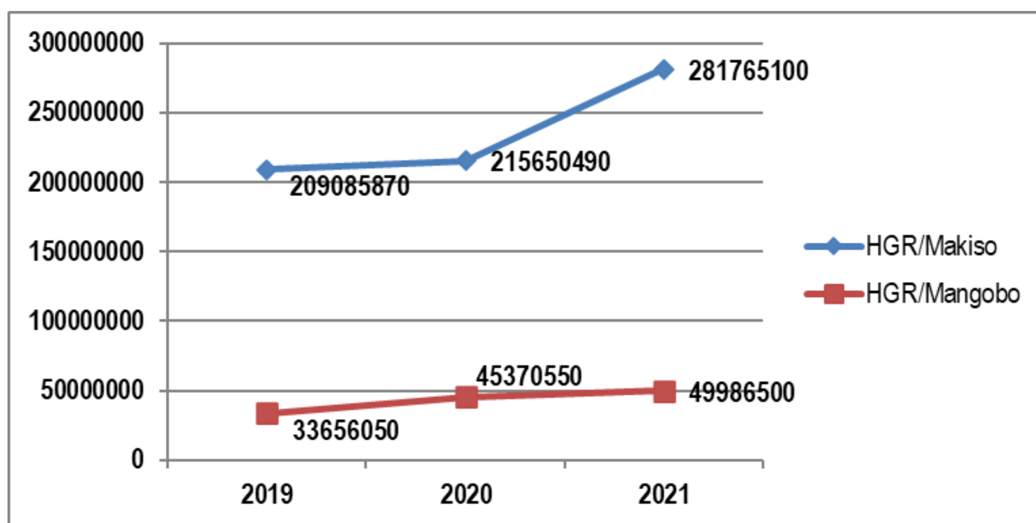

Figure 1 Evolution of revenues generated by the GRH/Makiso and the GRH/Mangobo.

As it can be seen in this graph, the revenues generated by Flat Rate Pricing at the GRH/Makiso are much higher than those generated by Pricing per Act at the GRH/Mangobo during the study period.

3.2. Comparison of revenue volume between the GRH/Makiso and the GRH/Mangobo

Table 2 Comparison of the volume of revenue between the GRH/Makiso and the GRH/Mangobo

Periodes	**GRH-Makiso/Flat rate pricing**		**GRH-Mangobo/Pricing per act**	
	Amount	**%**	**Amount**	**%**
2019	209,085,870	29.6	33,656,050	26.1
2020	215,650,490	30.5	45,370,550	35.2
2021	281,765,100	39.9	49,986,500	38.7
Total	**706,501,460**	**100**	**129,013,100**	**100**

In percentage terms, it appears over the entire study period (2019-2021) that the year 2021 maximized more revenues of around 39.9% for the GRH/Makiso applying Flat Rate Pricing, compared to 38.7% of revenue maximized for the GRH/Mangobo applying Pricing per Act. Which clearly indicates that Flat Rate Pricing produces more revenues than Pricing per Act.

3.3. Estimation as a percentage of annual revenue generated by Flat-rate Pricing and Pricing per Act

Table 3 Percentage of annual revenue generated by Flat-rate Pricing and Pricing per Act

Health Establishment	**Pricing type**	**Amount**	**%**
GRH/Makiso	Flat rate Pricing	706,501,460.00	86.6
GRH/Mangobo	Pricing per Act	129,013,100.00	13.4
Total		**835,514,560.00**	**100**

By comparing the amounts of revenue generated by the two public health establishments under examination, we easily note that the annual revenue produced by the Pricing per Act at the GRH/Mangobo from 2019 to 2021 is relatively lower than the annual revenue generated by the Flat-rate Pricing to the GRH/Makiso, respectively, 129,013,100.00 FC, against 706,501,460.00 FC.

We illustrate in the graph below the differences (in %) of Flat-rate pricing compared to Pricing per Act.

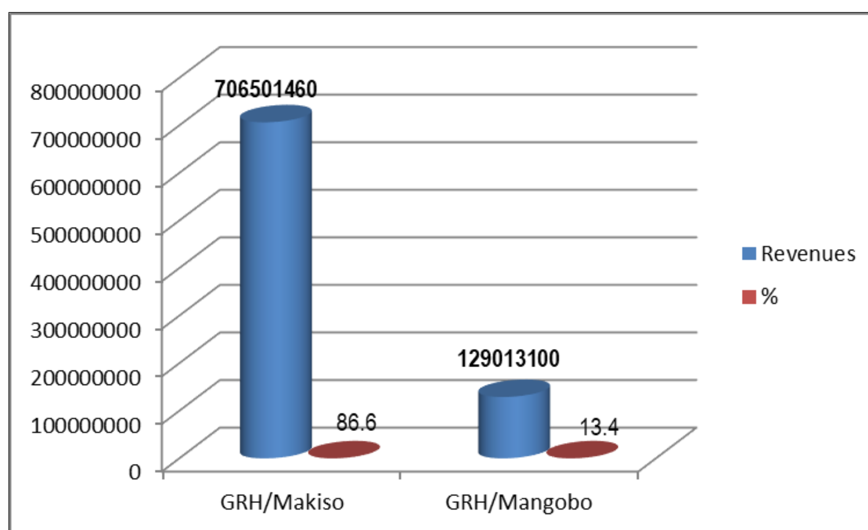

Figure 2 Estimation as a percentage of annual revenue generated by Flat-rate Pricing and Pricing per Act

Clearly shows that Flat Rate Pricing represents a high percentage of revenue generated compared to Pricing per Act.

3.4. Certification of results according to the Chi-square test

Given that our study concerns two different types of pricing applicable in 2 different health establishments, that is to say the GRH/Makiso and the GRH/Mangobo, we used the Chi-square test at the threshold of p=0.05 in order to compare the production of revenues generated by Flat Rate Pricing at the GRH/Makiso and Pricing per Act at the GRH/Mangobo.

After various calculations, it appears that for the GRH/Makiso the χ^2cal = 946576818.40 and for the GRH/Mangobo, the χ^2cal = 173,116,113.16. By comparing the two results, we notice that the χ^2cal= 946,576,818.40 for the GRH/Makiso is much greater than the χ^2cal= 173,116113.16 for the GRH/Mangobo. The difference being largely significant; df = 2 at the threshold of 0.05.

4. Discussion

4.1. Evolution of annual revenues generated by the GRH/Makiso and the GRH/Mangobo from 2019 to 2021

It emerged from our analyzes that the revenue generated by the Flat Rate Pricing at GRH/Makiso was of the order of 209,085,870.00 FC in 2019, or 29.6%; 215,650,490.00 FC in 2020 or 30.5% and 281,765,100.00 FC in 2021 or 39.9%, with a total amount amounting to 706,501,460.00 FC. By analyzing the trend of these revenues, we notice that last had evolved upwards, we recorded an increase in revenues each year. In a study carried out at GRH/Makiso from 2011 to 2015, Latshikali [7] found an overall amount of maximized revenue estimated at 697,150,000.00 FC.

By comparing the result of Latshikali over a period of 5 years with ours, it clearly appears that the annual revenues produced during 3 years of our study are relatively higher than those produced in 5 years, i.e. 706,501,460.00 FC > 697,150,000.00 FC. Several factors can validly explain this difference; in particular the high frequency of patients treated in this hospital, but also the financing of the Belgian NGO Enabel, a privileged partner of the Congolese State in primary health care.

The hospital, like any other social enterprise, can use several types of financing including internal and external financing, but with the current economic troubles, it is internal financing that allows the hospital to maximize revenues, because the public authorities are no longer able to subsidize health establishments for the health well-being of populations [12].

The strategies put in place by the GRH/Makiso management committee to maximize revenues through Flat Rate Pricing can be multiple, in particular having a large number of subscribers, the opening of a one-stop shop to be able to channel all recipes, etc.

4.2. Evolution of revenue produced by Pricing per Act at GRH/Mangobo

By analyzing the results relating to the evolution of revenues generated by the Pricing per Act at the GRH/Mangobo, it appears that they have also evolved proportionally to the increase including 33,656,050.00 FC or 26.1% in 2019; 45,370,550.00 FC or 35.2% in 2020 and 49,986,500.00 FC or 38.7% in 2021. We note that each year, these revenues have increased.

Paluku [8] found in his study that the revenues generated during a period of 3 years (2011-2013) amounted to 378,680,000.00 FC at the GRH/Mangobo. The result of our study is significantly lower than that of Paluku in 2016. This situation would be linked to the financial crisis which affects not only international or national institutions, but also local ones in general and public hospitals in particular. In addition, this crisis is characterized even within the population which is the main partner of the hospital, apart from some external financing.

This is how, on the one hand, healthcare establishments have a continual tendency to raise prices in order to optimize as much as possible of the revenue necessary for their operation. On the other hand, this price increase only favors the exclusion of the population from accessing care. Finally, the financial profitability of revenues in health institutions becomes hypothetical.

The financing of the health system in the DRC thus suffers from a great paradox, while patients are required to bear almost all of the financial costs of their health care and the operation of the medical training facilities which welcome them, their income far from enable them to meet such a challenge.

All these problems linked to the pricing of health care in the DRC are characterized by the disengagement of the government, the insufficiency of budgetary resources allocated to health by the State, the insufficiency of funding granted by communities to health, the poor mobilization of internal and external resources, delay in the disbursement of financial resources, poverty of the population (low support of the population for mutual health insurance, etc.), and health insurance, poor development of mutual health insurance , etc. [17].

4.3. Comparison between Flat Rate Pricing (GRH/Makiso) and Pricing per Act (GRH/Mangobo)

We noted that the revenues generated by the Flat Rate Pricing at the GRH/Makiso were much higher than those produced by the Pricing per Act at the GRH/Mangobo, i.e. 706,501,460.00 FC for the GRH/Makiso compared to 129,013,000.00 FC for the GRH/Mangobo. The Pearson Chi-square test confirms our result with a largely significant difference.

In terms of percentage, the amounts of revenues maximized by the GRH/Makiso and the GRH/Mangobo, we note that the revenues produced by the Flat Rate Pricing at the GRH/Makiso from 2019 to 2021 are greater than those produced by the Pricing per Act at the GRH/Mangobo, i.e. 84.6% compared to 15.4%. There is reason to say that fixed pricing is advantageous for the proper functioning of the hospital than pricing per procedure. From where we can say that Flat Rate Pricing allowed the GRH/Makiso to generate a lot of revenues.

4.4. Economic criticisms

The realities of maximizing revenue over a given period appear diametrically opposed from one hospital to another. The explanation that can be given for this opposition is due to the fact that the GRH/Makiso is a provincial health establishment based in Kisangani. It has several contracts concluded with subscribers and with certain national and international organizations, thus benefiting from funding from partners and subsidies. As a logical consequence, several medical procedures in this institution are billed according to the flat rate set by partners.

On the other hand, the GRH/Mangobo does not benefit from any state subsidy, any funding from health partners, nor payment of care bills by subscribers. Furthermore, in its structural organization, there is a lack of many revenue-generating services such as: the morgue, the ophthalmology department, the emergency department, the ENT department, etc. like the GRH/Makiso which works in full force. This is why it must apply pricing per act which follows the seriousness of the act performed by a healthcare provider before being billed for its operation.

In our opinion, flat rate pricing is all the more desirable, but also favorable for maximizing revenue in a hospital, because in their contracts signed with the Congolese government, partners and other donors bear part of the care bills. provided to patients and this can increase the salary envelope of the staff, because the flat rate increases the attendance of patients in care who, on their part, pay the medical costs without taking into account the action taken by the nursing staff; which exponentially increases the volume of hospital revenue.

On the other hand, Pricing per procedure weighs heavily on patients who are very often characterized by very low purchasing power; and this will result in a reduction in hospital revenues which are ultimately proportional to the number of patients and the procedures carried out.

Levraut [13] emphasizes that public funding should constitute the main source of financing for the public health sector both in terms of investment and operation. The long situation of state disengagement has shifted the burden of major investments to external financing and the current operating burden to the household. Recovery of care from households makes it possible to cover operating needs. Likewise, Silem, et al. [14] point out that there is a glaring absence of external financing oriented towards health. Due to their underfunding, public health institutions do not have the resources necessary to fully fulfill their mission and correctly play their role as a pivot for the development of the health zone.

In the Democratic Republic of Congo, state funding for the public health sector is characterized by the absence of sufficient, regular and adequate subsidies to cover the operating and investment costs of hospitals. The burden of financing health is essentially borne by the community, the vast majority of which is initially poor. The payment method applied in our health services which consists of direct payment poses enormous problems for the population and contributes to accentuating their state of poverty [15].

Health costs are the main factors that push people below the poverty line. Lack of money to buy medicines and to go to the hospital often forces people into debt that they have to repay for a long time or those forces them to sell their last possessions. There is growing dissatisfaction among stakeholders with standard solutions such as contribution financing, free care and dependence on external support [16].

5. Conclusion

Financing hospitals in the Democratic Republic of Congo constitutes a heavy burden on the government, which only grants a small percentage to access universal health coverage.

To ensure proper functioning, Flat Rate Pricing would be beneficial and desirable to allow revenue maximization in public health establishments. Hence, any health establishment that wants to boost its emergence will have to practice Flat Rate Pricing which, in our opinion, appears advantageous for managers.

Ultimately, the Congolese State should in principle provide substantial funding for health to enable the maximization of necessary revenue by implementing prevention and medical care measures meeting the needs of the population through health establishment public which do not benefit from any subsidy subscriber contract or partner financing.

Compliance with ethical standards

Disclosure of conflict of interest

The authors believe that there are no conflicts of interest in the conduct of this study.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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