

Costs of Schizophrenia at Psychiatric Hospital of Bingerville (Ivory Coast)

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Abstract

Schizophrenia is classified as a priority mental disorder by the World Health Organization (WHO) and accounts for around 35% of diagnoses at the Bingerville Psychiatric Hospital (HPB). The aims of the study were to identify the cost drivers for hospitalization and to calculate the costs of managing schizophrenia in hospital, with a view to planning household expenditure on care. This pilot cross-sectional study involved 31 patients with schizophrenia who had been hospitalized in the various third-category wards at the HPB between 1st January 2019 and 31st May 2020. Sampling was accidental. The methods used to estimate costs were based on the actual costs of drugs, hospitalization and additional examinations which prices were known, and on patients' estimations for certain expenses such as food and transport. Results: The sex ratio was 3.42, the mean age was 29.52 years. The mean length of stay was 46.19 days, and the most frequent clinical forms were paranoid schizophrenia (41.9%) and schizoaffective disorder (29%). The combination of haloperidol and chlorpromazine was the most common medications for initial treatment (67.8%) and maintenance treatment (41.9%). The average cost of hospitalization at HPB for schizophrenia was XOF 164,412 (€249.90). The average direct medical cost was XOF 105,412 (€160.226) and the average direct non-medical cost was XOF 59,000 (€89.68). The average daily cost of antipsychotic treatment was XOF 795/day (€1.2084). The high cost of drugs as a proportion of hospitalization costs suggested the need of a reflection on the simplification of prescribing practices, assistance in psychiatric emergencies and the development of other alternatives to psychiatric hospitalization in Côte d'Ivoire.

Keywords

Schizophrenia, Cost, Hospitalization, HPB, Côte d'Ivoire

1. Introduction

Health is a fundamental good for people in all countries and at all levels of society. The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [1]. Physical health and mental health are therefore two essential aspects of life that are intimately linked and closely interdependent. Unfortunately, in most parts of the world, mental health is not considered as important as physical health. According to the WHO, around 450 million people suffer from a mental illness or behavioral disorder, but only a small minority receives even the most basic care [1].

The economic consequences of mental disorders are profound, multiple, and long-lasting. These disorders entail a whole range of costs for the individual, his or her family and the community. Some of these costs are obvious and quantifiable, while others are almost impossible to measure. The former include the cost of health and social services, job loss and reduced productivity, the impact on the family, crime and insecurity, and premature death.

The total economic cost of mental disorders has been calculated, mainly in industrialized countries. It has been estimated that the cumulative annual cost in the United States represents around 2.5% of the gross national product. Several studies have been carried out in Europe to determine the share of expenditure devoted to mental disorders in the total cost of health services. The estimated figure was 23.2% in the Netherlands and 22% in the UK, only based on hospitalization costs [2]. No estimations are available for other regions of the world, but it is likely that mental disorders also constitute a substantial proportion of the overall economic cost.

Among the mental disorders that the WHO considers a priority is schizophrenia, with an estimated prevalence rate of 1% in the general population, regardless of race. There are no national figures for schizophrenia in Côte d’Ivoire, but it represents around 35% of diagnosis at the Bingerville Psychiatric Hospital (HPB), the main psychiatric inpatient establishment [3]. This chronic illness, which has major social consequences for patients, their families and society, is therefore one of the most frequently reported diagnoses. Treatment is regularly hampered by families’ difficulties in dealing with the expenses incurred by the hospitalization of their family member. The difficulty in honoring this care lies in the fact that it is not covered by public insurance. Currently, free healthcare in Côte d’Ivoire is targeted at children, pregnant women, and the treatment of certain diseases (tuberculosis, simple malaria, HIV infection). This study is therefore concerned with estimating the costs of hospitalization for schizophrenia at HPB. It fills a gap in documentation on the cost of psychiatric illnesses, both nationally and internationally, and could be a considerable contribution to the care and psychosocial support of people suffering from schizophrenia in Côte d’Ivoire.

The aim of the study was to provide objective information for advocacy with a view to promoting mental health, on the one hand, and planning care expendi-

ture by the households concerned, on the other. The general objective was to identify the factors contributing to the management of schizophrenia in hospitals.

The specific objectives were to:

- Identify the sociodemographic, clinical, and therapeutic characteristics of patients:
- Identify the factors that lead to the cost of hospitalizing schizophrenic patients
- Determine the total cost of care, including direct medical and non-medical costs.

2. Methods

This was a cross-sectional pilot study carried out at HPB. The point of view adopted for the cost study was that of the patients.

The survey was conducted over two months, with patients and their carers being interviewed individually on Mondays and Wednesdays

The sample consisted of 31 patients who had been hospitalized in the various third-category wards of the HPB between 1 January 2019 and 31 May 2020 and whose diagnosis was Schizophrenia according to DSM-IV criteria [4]. Subjects with a comorbid somatic pathology were not included. Sampling was accidental: patients were recruited when they came for their follow-up consultations after hospitalization. The information on the survey form was collected during an interview, based on responses from patients and their guardians, and from medical records. It provided information on the socio-demographic and economic characteristics of patients and their families, clinical and therapeutic characteristics, and cost indicators during hospitalization.

Direct costs correspond to medical and non-medical expenses incurred as a result of the illness. In general, they are estimated by multiplying the volume of resources consumed by the associated unit price. The methods used to estimate costs were based on the actual cost of drugs, hospitalization and complementary examinations, which prices were known, and on patients' estimates of certain expenses such as food and transport.

In our study, direct medical costs were the costs of evacuation + the costs of hospitalization + the costs of initial treatment + the costs of maintenance treatment during hospitalization + the costs of complementary examinations and associated treatments. Direct non-medical costs included the cost of transport for accompanying persons and/or visitors and the cost of a supplementary meal multiplied by the average length of hospitalization. The total cost is made up of the sum of the direct medical cost and the direct non-medical cost during the period of hospitalization.

The data was processed using Sphinx plus V5, SPSS and Excell softwares.

3. Results

3.1. Socio-Demographic Characteristics

The sex ratio was 3.42 with a sample of 7 females and 24 males; most of them

were single without children (87.1%).

The mean age was 29.52 with a minimum of 17 and a maximum of 47.

90.3% of patients had attended school, most of them at primary (29%) or secondary (35.5%) level. Only 13% of patients had a job; 68% had no income-generating activity. Most of the patients (96.75%) were dependent on their family, especially parents (80.6%) but also children or siblings.

3.2. Clinical Characteristics

Hospitalization was generally at the request of the family (97%).

61.3% of patients were hospitalized for the first time. The disease was progressing over a period of between 3 and 5 years (in 67.7% of cases), while the first hospitalization was less than a year ago (67.8%).

The different forms of schizophrenia have been found (**Table 1**).

The average length of stay was 46.19 days, with a minimum of 14 days and a maximum of 110 days.

3.3. Therapeutic Characteristics

The most ordered tests were the usual biological tests: CBC, urea, blood glycaemia, creatinine, transaminases, HIV, TPHA-VDRL, gamma-GT. Radiological investigations (EEG, brain scan and MRI) were rarely requested, and more than a third of patients did not make investigations.

Treatment generally started by injection for about three days (**Table 2**), followed by oral or delayed-release treatment for maintenance (**Table 3**).

Dosages varied from 200 to 400 mg/day for chlorpromazin, 100 to 300 mg/day for levomepromazine and 5 to 10 mg/day for haloperidol. Fluphenazine decanoate was used at a dose of 100 mg/month, while haloperidol decanoate was injected at 150 mg/month - 200 mg/month.

3.4. Direct Medical and Non-Medical Costs

The main direct medical costs associated with schizophrenia include hospitalization and consultations' fees, drug treatments (antipsychotics, but also, when applicable, treatment of adverse effects,) and laboratory and radiology tests (**Table 4**). Direct non-medical costs correspond to support expenses such as transport costs and those linked to the presence of a carer (**Table 5**).

Table 1. Distribution of patients by diagnosis.

Diagnosis	n	%
Paranoid schizophrenia	13	41.9
Undifferentiated schizophrenia	1	3.2
Catatonic schizophrenia	3	9.7
Residual schizophrenia	5	16.1
Schizoaffective disorder	9	29.0
Disorganized schizophrenia	0	0
Total	31	100.0

Table 2. Distribution of patients according to the antipsychotics used for the initial treatment (first three days of hospitalization).

Products used for maintenance treatment	N	%
Haloperidol 5 mg oral + chlorpromazin oral	13	41.9%
Haloperidol 5 mg oral + Levomepromazine oral	6	19.4%
Fluphenazine decanoate + chlorpromazin oral	1	3.2%
Haloperidol decanoate 50 mg inj + Levomepromazine oral	2	6.5%
Haloperidol decanoate 50 mg inj + chlorpromazin oral	3	9.7%
Levomepromazine oral	1	3.2%
Chlorpromazin oral	2	6.5%
Haloperidol decanoate 50 mg inj	1	3.2%
Fluphenazine decanoate	1	3.2%
Sulpiride oral	1	3.2%
Total	31	100%

Table 3. Distribution of patients according to the products used for maintenance treatment.

Products used for initial treatment	N	%
Haloperidol 5 mg inj		
Levopromazine inj	21	67.8
Chlorpromazin inj	7	22.6
Chlorpromazin inj	1	3.2
Fluphenazine inj	1	3.2
Sulpiride inj	1	3.2
Total	31	100

Table 4. Direct medical costs.

	Minimum cost XOF	Average cost XOF	Maximum cost XOF
Evacuation (transport fees)	5000 (7.62 €)	7483 (11.40 €)	25,000 (38.11 €)
Hospitalization fees	13,000 (19.82 €)	20,290 (30.93 €)	23,000 (35.06 €)
Consultation fees	Consultations are not billed during hospitalization.		
Initial treatment	155 × 3 = 465 (0.71 €)	2370 × 3 = 7110 (10.84 €)	3450 × 3 = 10,350 (15.78 €)
Maintenance treatment	223 × 43 = 9589 (14.62 €)	685 × 43 = 2945 (44.90 €)	1708 × 43 = 73 444 (111.97 €)
SUB-TOTAL 1	28,054 (42.77 €)	64,338 (98.08 €)	131,794 (200.92 €)
Other treatments	1500 (2.29 €)	4036 (6.15 €)	8590 (13.10 €)
Laboratory tests	7000 (10.67 €)	13,205 (20.13 €)	19,000 (28.97 €)
Radiological examinations	5000 (7.62 €)	23,833 (36.33 €)	70,000 (106.71 €)
SUB-TOTAL 2	14,500 (22.10 €)	41,074 (62.62 €)	97,590 (148.78 €)
Total direct medical costs (S/T1 + S/T2)	42,554 (64.87 €)	105,412 (160.70 €)	229,384 (349.70 €)

The daily direct cost averaged XOF 2291.56 (€3.49) with a minimum of XOF 925.06 (€1.41) and a maximum of XOF 4986.60 (€7.60).

The daily cost of antipsychotic treatment ranged from XOF 218.565 (€0.33) to XOF 1821 (€2.77) with an average of XOF 795/day (€1.21/day).

The average daily non-medical direct cost was XOF 1282.60 (€1.95) ranging from XOF 1021.73 (€1.56) to XOF 1543.47 (€2.35).

3.5. Total Direct Cost of Care

Direct costs correspond to medical and non-medical expenses incurred because of the illness (Table 6 and Figure 1).

The average daily cost was XOF 3574.173/day (€5.45/D) with a minimum of XOF 1946.82/day (€2.97/D) and a maximum of XOF 6530.086/day (€9.95/D).

4. Comments and Discussion

Schizophrenia is a disease of young people, with negative symptoms such as apragmatism and abulia. It is often complicated by a lack of financial and material autonomy, leading to patients becoming dependent on their families, with whom they generally live and on whom the burden of care falls. In Abidjan, Yavo

Table 5. Non-medical direct costs.

	Minimum cost	Average cost	Maximum cost
Cost of daily meal	1000 (1.52 €)	1250 (1.90 €)	1500 (2.28 €)
Cost of transport for accompanying person	1000 (1.52 €)	1500 (2.28 €)	2000 (3.05 €)
Total Direct non-medical costs for the duration of the stay	47,000 (71.65 €)	59,000 (89.94 €)	71,000 (108.24 €)

Table 6. Total direct costs of inpatient care.

	Minimum cost	Average cost	Maximum cost
Total direct medical costs	42,554 (64.87 €)	105,412 (160.70 €)	229,384 (349.70 €)
Total direct non-medical costs	47,000 (71.65 €)	59,000 (89.94 €)	71,000 (108.24 €)
Total Cost of inpatient care	89,554 (136.52 €)	164,412 (250.64 €)	300,384 (457.93 €)

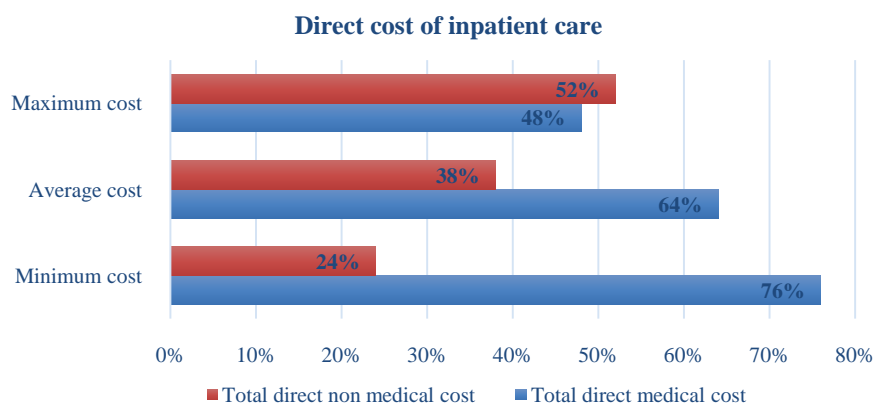


Figure 1. Distribution of the direct cost of inpatient care.

[5] found that 45.5% of schizophrenia cases occurred in the 16 - 25 age group and 50% in the 26 - 45 age group.

The most frequently observed disorders were paranoid schizophrenia (41.9%) and schizoaffective disorders (29.0%).

Management of schizophrenia is based on neuroleptic treatment, as well as care and support. At the HPB, it is recommended that a guardian stayed with the patient throughout hospitalization [6]. In this study, we set out to assess the different costs of care. The costs of caring for patients hospitalized for schizophrenia are made up of direct medical costs, including evacuation, hospitalization, initial and maintenance treatment, adjuvant treatments and paraclinical examinations, and direct non-medical costs, including those incurred by the guardian.

The most prescribed drugs are chlorpromazine (22.6%) and levomepromazine (67.8%), all first-generation antipsychotics with well-known side effects. In Uganda, haloperidol is the first-line treatment [7].

We found a high proportion of drug combinations combining incisive antipsychotics and sedative antipsychotics, justifying their use as first-line treatment for patients with high levels of agitation and aggression. Levomepromazine is also more widely used, as it is more sedating. In maintenance treatment, these associations can only be explained either by prescribing habits or by the need to manage sleep disorders. This practice also increases the risk of side effects.

2nd generation antipsychotics were rarely prescribed at HPB at the time of the study. This practice, which is at odds with current recommendations that 2nd-generation antipsychotics (e.g. Olanzapine) should be the first-line treatment [8], can be explained by their high cost and the difficulty of access to these products in the study setting. According to the Vidal dictionary [9], the daily cost of treatment with olanzapine at doses ranging from 5 to 20 mg/day was XOF 1429.98 (€2.18) to XOF 5472.24 (€8.34), while that of haloperidol at doses ranging from 1 to 20 mg/day varied from XOF 32.797 (€0.05) to XOF 662.516 (€1.01). The daily cost of antipsychotic treatment in our study is close to these rates, with an average of XOF 795/day (€1.21/day), while haloperidol was generally combined with another molecule.

The total cost of medicines ranged from XOF 10,054 (€15.33) to XOF 83,794 (€127.75) with an average of XOF 36,565 (€55.74), representing 35% of direct medical costs. These significant variations in drug prices depended on where the products were purchased. Those sold by the public health pharmacy (PSP), a public establishment, costed less. However, due to frequent stock-outs at the PSP, which often last for extended periods (one to three months or even longer), medicines were often purchased from city pharmacies.

Direct medical costs thus represent between 48% and 76.3% of the total cost of hospitalization, with an average of 64%. This significant variation in costs should not be observed in a public hospital. But the difficulties of a psychiatric hospital, with its lack of basic technical facilities such as a biology laboratory, an electroencephalograph, a radiology department, and a pharmacy well-stocked with

reference products, means that patients and their families must use external services whose prices are often variable and higher than in public services.

The high cost of certain examinations, such as the Electroencephalogram (XOF 25,000 and the Cranioencephalic Scan (XOF 50,000), limits access for most patients, and only those with enough financial resources undergo the additional examinations prescribed.

The presence of a guardian with the hospitalized patient was a response to the desire of the nursing staff to fight against the stigmatization and rejection of hospitalized patients, to educate and explain the disease, to prepare relatives for proper compliance and continuity of treatment after hospitalization, and to facilitate family reintegration [6]. However, this presence generated additional costs for the family, accounting for a significant proportion of hospitalization-related expenses ranging from 24% to 52%, with an average of 36%. As these elements were essentially made up of the cost of the daily meal for the patient and his/her companion, it was important to consider the conditions of hospitalization at HPB.

The total cost of hospitalization at the HPB for schizophrenia, with an average of XOF 164,412 (€250.64) and an average daily cost of XOF 3574.173/day (€5.45/D), remained high in relation to the income of most people caring for patients hospitalized at HPB. For many of them (67%), the monthly income level does not reach or exceed XOF 200,000 (€304.9). In France, Raymond found a daily cost of €288.30 [10]. In 1975, in the United States, the average cost per day of hospitalization was estimated at USD 74 (XOF 37413.89) for the first 10 days, and USD 61 (XOF 30841.20) for subsequent days [11]

In 2020, the average basic monthly salary in Côte d'Ivoire was XOF 112,981 (191 USD or €172.23) [12] and the poverty rate was about 35% [13]. This total cost was equivalent to 2.7 time of the Minimum interprofessional guaranteed salary at the time of the survey (XOF 60,000 (€91) [14]. Yavo pointed out that this could be a bad factor in patient care, as parents would be unable to meet the demands of practitioners [5]. The cost of schizophrenia hospitalization at HPB in 2020 remains lower than that of inpatient care in the USA, although this must be qualified by the evolution of psychiatric practices since 1975. In Kenya, the cost is Int\$594 per person in the first year and Int\$876 over 2 years [15].

As Barbosa [16] pointed out, atypical antipsychotics were responsible for most schizophrenia treatment costs, and psychiatric hospitalization costs were the highest average annual cost per patient.

In view of the data in this study, it is undeniable that the cost of hospitalization at HPB for schizophrenia placed a heavy burden on family incomes. The results call for antipsychotics to be included on the list of essential medicines in Côte d'Ivoire to reduce costs of mental diseases.

The limitations of the study are the memory bias associated with information forgotten by the interviewees and the impossibility of verifying certain information, particularly that concerning income level. This information is confidential

in our environment, especially as the guardians are not generally those who pay for the care. Moreover, this information is also hidden in the hope of benefiting from assistance with care. The low number of patients was due to the large number who dropped out of post-hospital follow-up. Like the delay in medical treatment, the premature cessation of medication can be explained by the cultural interpretation of mental illness, which, combined with religious practices, often leads to wandering in the pursuit of recovery.

5. Conclusions

Schizophrenia is a serious condition because of its early onset and its impact on the individual's social and professional development, but it also has an impact on the income of sufferers and their families. The wide variation in the cost of medication, and the fact that it accounts for a significant proportion of hospitalization costs, means that thought needs to be given to changing prescribing practices, with a view to simplifying prescribing and reducing costs, thereby improving compliance with treatment.

Similarly, it is important to consider the question of assistance in psychiatric emergencies in our country.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] Organisation Mondiale de la Santé (OMS) (2001) Rapport sur la santé dans le monde 2001. La santé mentale: Nouvelle conception, nouveaux espoirs, Genève.
- [2] Launois, R., Toumi, M., Créneau, S. and Lançon, C. (1998) Le coût de la schizophrénie: un labyrinthe inextricable ou une aide à la décision? *Encephale*, **24**, 83-99.
- [3] Hôpital Psychiatrique de Bingerville (2020) Rapport-Bilan de gestion 2019 et Projet de budget exercice. Bingerville.
- [4] American Psychiatric Association (1995) DSM-IV Manuel Diagnostique et Statistique des troubles Mentaux. 4ème édition, MASSON, Paris, 321-372.
- [5] Yavo, P.Y., Yeo-Tenena, Y.J.-M., Assi-Sedji, C., Tetchi, E.O., Ngongi, K.P.P. and Delafosse, R.C.J. (2009) Itinéraires thérapeutiques des schizophrènes à Abidjan. *L'Information Psychiatrique*, **85**, 461-469. <https://doi.org/10.1684/ipe.2009.0491>
- [6] Kouadio, Y.C. (2010) Admission d'un accompagnant de malade à l'Hôpital Psychiatrique de Bingerville: Pratiques et attentes du personnel soignant. Thèse Med, Université Nationale de Côte d'Ivoire, Abidjan, 96.
- [7] Lubinga, S.J., Mutamba, B.B., Nganizi, A. and Babigumira, J.B. (2015) A Cost-Effectiveness Analysis of Antipsychotics for Treatment of Schizophrenia in Uganda. *Applied Health Economics and Health Policy*, **13**, 493-506. <https://doi.org/10.1007/s40258-015-0176-3>
- [8] Perlemeuter, L. and Perlemeuter, G. (2006) Guide de thérapeutique. Nouvelle édition actualisée, Masson, Paris 2001, 2002, 2003, 2006, 4e édition, 1608-1618.

- [9] http://forum.doctissimo.fr/psychologie/schizophrenie/vidal-haldol-sujet_148840_1.html
- [10] Raymond, S., Martin, M., Christian Netillard, C., Mejat-Alder, E., Woronoff-Lemsi, M.C. and Tissot, E. (2009) Schizophrénie: évaluation du coût de la prise en charge. *Journal d'économie Médicale*, **27**, 421-433. <https://doi.org/10.3917/jgem.097.0421>
- [11] Rupp, A. and Keith, S.J. (1993) The Cost of Schizophrenia—Assessing the Burden. *Psychiatric Clinics of North America*, **16**, 413-423. <https://www.sciencedirect.com/science/article/abs/pii/S0193953X18301825>
- [12] Salaire moyen en Côte d'Ivoire. <https://www.journaldunet.com/business/salaire/cote-d-ivoire/pays-civ>
- [13] Côte d'Ivoire: Rapport économique 2020. https://www.gouv.ci/_actualite-article.php?recordID=14163
- [14] Conseil des ministres: le SMIG revalorisé à 60 000fcfa. <https://www.gouv.ci/Main.php>
- [15] Menil, V., Knapp, M., McDaid, D., Raja, S., Kingori, J., Waruguru, M., Wood, S.K., Mannarath, S. and Lund, C. (2015) Cost-Effectiveness of the Mental Health and Development Model for Schizophrenia-Spectrum and Bipolar Disorders in Rural Kenya. *Psychological Medicine*, **45**, 2747-2756. <https://doi.org/10.1017/S0033291715000719>
- [16] Barbosa, W.B., Costa, J.O., de Lemos, L.L.P., *et al.* (2018) Costs in the Treatment of Schizophrenia in Adults Receiving Atypical Antipsychotics: An 11-Year Cohort in Brazil. *Applied Health Economics and Health Policy*, **16**, 697-709. <https://doi.org/10.1007/s40258-018-0408-4>