

# Out-of-pocket and catastrophic expenses in households of patients with schizophrenia lacking social security

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## Abstract

**Objective.** To estimate the magnitude of out-of-pocket (OOP) and catastrophic health expenses as well as impoverishment experienced by households of schizophrenia patients lacking social security coverage. **Materials and methods.** We conducted a cross-sectional study of 96 individuals treated outpatient consultation between February and December 2018, in a psychiatric hospital. **Results.** All households sustained OOP health expenses; the median was 510 USD (95%CI: 456-628). The OOP expenses represented 28 and 4% of the capacity to pay of poor and rich households, respectively. The 16% of households incurred catastrophic expenses and 6.6% have impoverishment for health reasons. **Conclusions.** Our results illustrate that pocket expenses and catastrophic expenses in patients with schizophrenia are higher than those reported for the general population. Therefore, it is necessary to rethink the financial protection policies aimed at patients with schizophrenia and their households.

**Keywords:** Out-of-pocket expenses; catastrophic expenses; impoverishment; schizophrenia

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## Resumen

**Objetivo.** Estimar la magnitud del gasto de bolsillo y catastrófico en salud, así como el empobrecimiento experimentado por hogares de pacientes con esquizofrenia que carecen de cobertura en seguridad social. **Material y métodos.** Se hizo un estudio transversal de 96 pacientes tratados en consulta externa entre febrero y diciembre de 2018, en un hospital psiquiátrico. **Resultados.** Todos los hogares soportaron gastos de bolsillo (GB), la mediana fue 510 USD (IC95%: 456-628). Los GB representan 28 y 4% de la capacidad de pago de los hogares pobres y ricos respectivamente. El 16% de los hogares incurrió en gastos catastróficos y 6.6% tiene empobrecimiento por motivos de salud. **Conclusiones.** Los resultados muestran que los gastos de bolsillo y gastos catastróficos en pacientes con esquizofrenia son mayores que los reportados para población general, por lo que es necesario repensar las políticas de protección financiera dirigidas a pacientes con esquizofrenia y sus hogares.

**Palabras clave:** Gasto de bolsillo; gastos catastróficos; empobrecimiento; esquizofrenia

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Schizophrenia, a clinical syndrome with variable psychopathology, affects cognition, emotions, perception and other aspects of behavior, they are invariably severe and usually prolonged; which translates into health expenses. The onset of schizophrenia commonly occurs at the ages of 18-25 years in men and 21-30 years in women.<sup>1</sup> The prevalence of schizophrenia has been estimated at 0.48 % (IQR: 0.34%-0.85%).<sup>2</sup>

According to the World Bank, out-of-pocket (OOP) health expenses affect 44.7% of the Mexican population, well above the average for Organization for Economic Cooperation and Development (OECD) member states which is 13.7%, while the Latin American average and upper-middle-income countries are 30.0% and 28.3% respectively.<sup>3</sup>

According to data from the Health Information General Direction (DGIS by its Spanish initials), OOP health expenses represented 52.2% of health spending in the year 2000 and for year 2018 it was 42.1%. In addition to the majority of OOP spending is concentrated in the population without social security.<sup>4</sup>

In Mexico, OOP health expenses has represented a high percentage of total health spending. In 2003, one of the strategies to reduce it was to establish the Social Health Protection System (SPSS by its Spanish initials), whose main objective was to reduce catastrophic and impoverished expenses, that is, to give financial protection to the population without social security.<sup>5</sup> The first SPSS impact simulations (considering that each household will contribute 5% of available spending) was expected to reduce the percentage of households with catastrophic expenses from 3.4 to 1.6%.<sup>6</sup>

The SPSS was executed by the *Seguro Popular* (SP by its Spanish initials) and included mental disorders in the Universal Catalog of Health Services. In the case of schizophrenia and other psychotic disorders, patients could access two annual hospitalizations of less than 20 days each one, auxiliary studies diagnostic, outpatient consultation and antipsychotic medication.<sup>5</sup>

The inclusion of interventions to care for patients with schizophrenia was important since specifically for schizophrenia; the demand for health care among patients without social security coverage increased by 33% between 2005 and 2013, with the annual cost per case for the Mexican health system estimated at USD 2 216 during that period.<sup>7</sup> Studies of other vulnerable groups such as the elderly have documented that the implementation of the SPSS program in Mexico outcomes limited.<sup>8,9</sup> However, no reports were found regarding financial protection in patients suffering from schizophrenia during the period that SPSS operated.

Assessing the health-related OOP expenses, catastrophic expenses (CE) and impoverishment of

households of schizophrenia patients is crucial given the dearth of studies on the subject in Mexico and other Latin American countries. The consequences of these events for patients with mental disorders –particularly schizophrenia– and their families can be devastating; because the direct payments for health services can push households into or deepen their poverty. The households facing health expenditures are often compelled to interrupt meeting other essential needs and the households might decide to postpone seeking care for their health needs in order to avoid a financial catastrophe caused by paying for health services, thus creating a vicious circle of illness, disability, and poverty.<sup>10</sup>

We therefore undertook this study in order to estimate the magnitude of OOP health expenses, CE and impoverishment caused by medical care expenditures incurred by patients with schizophrenia and their families in the Mexican public-health system.

## Materials and methods

### Design

We conducted a cross-sectional study of schizophrenia patients without social security coverage, of a public psychiatric hospital of Mexico City. We determined sample size according to the formula for estimating proportions of populations with absolute precision: 50% anticipated probable OOP expenses, with a 95% confidence level.

We designed an *ad hoc* income and expenses questionnaire including the following variables: 1) socio-demographics (sex, age, education and occupation), 2) household income, 3) household expenses, 4) food expenses and 5) OOP expenses for health care.

Our sample was composed of individuals with diagnosed schizophrenia using the outpatient consultation; after obtaining informed consent, we administered the questionnaire in a face-to-face interview to clinically stable patients and / or to the responsible family member (mother, father, brother, partner). In most cases, the responsible family member answered the questions. The diagnosis was confirmed in the clinical record. We excluded criteria referred to patients with comorbidity, unwilling to answer the questionnaire, or unable to recall the income and expenses of their households in the previous month.

Recruiting was carried out between February and December 2018. To avoid memory bias, information on all variables related to income and OOP health expenses was based on figures from the previous month, as it has been shown that short recall periods increase the estimates for the annual average of health expenses.<sup>11</sup>

In all possible cases, the OOP health expenses were corroborated with the payment tickets.

### Definition of variables<sup>12,13</sup>

#### *OOP health expenses*

The OOP health expenses were defined as the direct payment made by individuals at the time of use of the service; this includes payments for formal, informal, traditional medicine, medical services, hospitals, clinics, pharmacological products, diagnostic and treatment medicines. Prepayment of health services or any reimbursement was excluded.

#### *Food expenditure*

This variable concerned the amount spent by households on all food products consumed plus the value of food prepared by the families themselves. Food expenditure excluded tobacco, alcoholic beverages and meals for leisure outside the home.

#### *Household expenses*

This variable included cash and in-kind purchases of all household goods and services based on the monetary value of consumption of the products elaborated by the family.

#### *Household income*

This variable referred to income received by households from wages, pensions and remittances, as well as support from social or private programs for the purchase of medicines.

#### *Catastrophic expenses (CEs) for health care*

CEs were defined as household expenditures on health care exceeding the household subsistence level of the household, that is, total capacity to pay (TCP) defined as the non-subsistence effective income of the household. We used the 40% of the TCP to capture the effect of CGs on poor households, according to World Health Organization method recommendation, contrary the shared budget method whose thresholds are 10, 25<sup>14</sup> or 30%.<sup>15</sup>

#### *Impoverishment for health reasons*

Households were classified as having met this criterion when they crossed the poverty line as a consequence

of their health expenses. The poverty line is defined as the food expenditure of the household whose food expenditure share of total household expenditure is within the 45th and 55th percentile of the total sample; to adjust for household composition is used equivalence scale.

### Statistical analysis\*

We developed descriptive statistics using average and standard deviations for continuous variables sociodemographic, and absolute and relative frequencies for categorical variables; besides, median and confidence interval to incomes and expenses and Shapiro-Wilk test. We measured OOP health expenses for ambulatory care, diagnostic procedures and hospitalizations by event, but annualized expenses for medications using last-month amounts, assuming that, in chronic illnesses, medicine expenses remain constant for one year. We applied the same criteria to estimate annual household income and expenses to homologate them to the same period according to the frequency of each one.

Once the household income, OOP health expenses and food expenses were counted; the poverty line (PL) was calculated as the average food expenditure per person (equivalence) among households whose food expenditures are between the 45th percentile and 55 of the sample. Next, the subsistence expenditure (SE) for each household was calculated using  $SEh = PLh * eqth$  where eqth is the size of the household. Finally, OOP health expenses was determined as a proportion of the capacity to pay.<sup>13</sup> For estimates we used the following formula:

$$CEh=1; \frac{OOPh}{TCP_h} \geq 0.4$$

To measure the distribution of household CEs, we constructed income quintiles based on the cut-off points used by the National Survey of Household Incomes and Expenditures (ENIGH by its Spanish initials).<sup>16</sup> Data were obtained in Mexican pesos and converted into US dollars at the June 2018 exchange rate (1 USD= 20.03 MXN).

The investigation was considered of minimal risk according to Mexican legislation and was approved by the Ethics and Research Committee of the Psychiatric Hospital (Project Ref. 712).

\* All analyses were performed with Version 25 of the Statistics Program SPSS

## Results

Our analysis included 96 patients, two-thirds of whom were men. The majority of participants reported being single and unemployed. Nearly all those who were working were engaged in the informal economy. The mean age in our sample was 37 years, and the average schooling was 10 years. Participants had been in psychiatric treatment for an average of 7.5 years, with 52% reporting over 10 years of clinical evolution (table I).

Regarding the use of health services, 67% of patients had been hospitalized, 100% had received outpatient consultations, 52% had undergone an auxiliary diagnostic study. The patients had access to two outpatient consultation in last year, only 9% of their households obtained support for the purchase of medications and 24% revived free medical consultation. In addition, access to auxiliary diagnostic studies was scarce (laboratory or radiology) (table II).

All households had OOP health expenses for hospitalization, medications, medical visits or diagnostic

studies. Purchase of medications accounted for 97% of OOP health expenses, followed by hospitalization and auxiliary diagnostic studies, while outpatient consultation expenses represented 1% (table III).

Similarly, the average annual income for each quintile was lower than the average annual income reported by the ENIGH,<sup>16</sup> the same as the poverty line of the sample (644 USD vs. 915 USD).<sup>17</sup> The payment for medicines was highest for households in the middle quintile; those in the poorest and richest quintiles showed similar figures. Hospitalization expenses were higher for those in the middle-income quintile, while the richest quintile spent more on medical consultations, auxiliary diagnostic studies, and transportation (table IV).

Regarding the distribution of households by income, the data showed that almost all the households in our study fell within quintiles II and I (41 and 30 household respectively). Annual per capita income was ten times higher for those in the richest as compared to the poorest quintile.

**Table I**  
**SOCIODEMOGRAPHIC VARIABLES OF PATIENTS.**  
**MEXICO CITY, 2020**

|                           | <i>n</i> = 96 | %    |
|---------------------------|---------------|------|
| Gender                    |               |      |
| Male                      | 60            | 62.5 |
| Female                    | 36            | 37.5 |
| Marital status            |               |      |
| Single                    | 86            | 89.5 |
| Married                   | 10            | 10.5 |
| Average age in years (SD) | 37 (12.3)     |      |
| 18-40                     | 57            | 59.3 |
| 41-65                     | 38            | 39.8 |
| >65                       | 1             | 1.04 |
| Years since diagnosis     |               |      |
| >6m <1                    | 10            | 10.4 |
| 1-5                       | 22            | 22.9 |
| 5-10                      | 14            | 14.5 |
| >10                       | 50            | 52.0 |
| Work activity             |               |      |
| None                      | 69            | 71.8 |
| Informal                  | 22            | 22.9 |
| Technical                 | 3             | 3.1  |
| Professional              | 2             | 2.0  |

SD: Standard deviation

**Table II**  
**SERVICES USE OF PATIENTS IN LAST 12 MONTHS.**  
**MEXICO CITY, 2020**

|                                | <i>N</i> =96 | %   | Median | Range |
|--------------------------------|--------------|-----|--------|-------|
| Hospitalization                | 64           | 67  | 1      | 1     |
| Outpatient consultation        | 96           | 100 | 2      | 3     |
| Emergency medical consultation | 64           | 67  | 1      | 2     |
| Auxiliary diagnostic study     | 49           | 52  | 1      | 1     |
| Outpatient consultation by SP  | 24           | 24  | 1      | 1     |
| Medicines by SP                | 8            | 9   | -      | -     |

SP: Seguro Popular

**Table III**  
**OUT-OF-POCKET HEALTH EXPENSES FOR**  
**PSYCHIATRIC CARE (N=96). MEXICO CITY, 2020**

|                          | <i>N</i> | %     | Mean (USD) | Median (USD) | CI95% (USD) |
|--------------------------|----------|-------|------------|--------------|-------------|
| Out-of-pocket expenses a | 96       | 100   | 543        | 510          | 456-628     |
| Hospitalization          | 56       | 58.3  | 74         | 52           | 57-89       |
| Medicines                | 86       | 89.5  | 527        | 457          | 442-610     |
| Outpatient consultations | 72       | 75.0  | 5          | 4            | 3-7         |
| Diagnostic studies       | 54       | 56.2  | 21         | 16           | 6-24        |
| Transportation           | 92       | 95.83 | 16         | 11           | 12-20       |

Shapiro-Wilk Test *p*-value=0.896, *p*=0.000  
20.3 MXN= 1 USD (Jun 2018)

The 16% of households incurred in CE, so the OOP representing more the 40% TCP. The percentage of households who became impoverished as a result of OOP health expenses was 6.6%. Nearly half of the households fell within the poorest quintile and a third within the second poorest. More of 80% of household of most poor quintile suffer catastrophic expenses contrary in the middle and upper quintile any household suffer CE or impoverishment (table V).

The capacity to pay exceeds the income of the poorest households, except the richest quintiles, that is, the deficit in income is greater in the poor quintiles; in addition, the TCP illustrate the effect of the OOP better than household spending (table V).

## Discussion

Our study demonstrates that 16.6% of households of patients with schizophrenia had OOP health expenses as a percentage of total household capacity to pay. This amount is much higher than 2.3% reported for the general population.<sup>15</sup> In addition, 100% of households had OOP health expenses and the main reason was the payment of medicines (89.5%); these data exceed that reported for the general population which is 45.1% for total OOP health expenses and 53.6% for medicines, according to National Health and Nutrition Survey 2018 (Ensanut by its Spanish initials).<sup>18</sup> Several studies have shown that the pur-

**Table IV**  
**INCOME QUINTILES AND OUT-OF-POCKET HEALTH EXPENSES BY INCOME QUINTILE (N=96). MÉXICO CITY, 2020**

| Income quintile (n) | Annual income ENIGH (USD) * | Annual income simple (USD) *‡ | Hospitalization (USD) | Medicines (USD) | outpatient consultations (USD) | Diagnostic auxiliary Studies (USD) | Transportation (USD) |
|---------------------|-----------------------------|-------------------------------|-----------------------|-----------------|--------------------------------|------------------------------------|----------------------|
| I (41)              | 2 742                       | 2 584                         | 21                    | 397             | 4                              | 9                                  | 14                   |
| II (30)             | 4 861                       | 4 213                         | 38                    | 468             | 3                              | 15                                 | 19                   |
| III (18)            | 6 861                       | 6 081                         | 67                    | 501             | 4                              | 20                                 | 10                   |
| IV (5)              | 11 145                      | 9 436                         | 21                    | 805             | 8                              | 10                                 | 8                    |
| V (2)               | 31 193                      | 21 931                        | 37                    | 386             | 18                             | 34                                 | 40                   |
| Sample (median)     |                             | 3 547                         | 52                    | 457             | 4                              | 16                                 | 11                   |

\* Average annual income (current value Jun 2018) 20.3 MXN= 1 USD

‡ Shapiro-Wilk test p-value=0.556, p=0.000

ENIGH: Encuesta Nacional de Ingresos y Gasto de los Hogares 2018

**Table V**  
**CATASTROPHIC HEALTH EXPENSES AND IMPOVERISHMENT BY INCOME QUINTILE. MÉXICO CITY, 2020**

| Income quintile (n) | Catastrophic expenses (%) | Impoverishment (%) | Annual income per capita (US\$) | Median annual OOP (US\$) | TCP (US\$) | % OOP of TCP | % OOP of HEs |
|---------------------|---------------------------|--------------------|---------------------------------|--------------------------|------------|--------------|--------------|
| I (41)              | 81                        | 83                 | 701                             | 444                      | 1.412      | 28           | 16           |
| II (30)             | 13                        | 17                 | 1.105                           | 531                      | 2.916      | 19           | 13           |
| III (18)            | 6                         | -                  | 1.393                           | 506                      | 4.414      | 11           | 8            |
| IV (5)              | -                         | -                  | 2.568                           | 833                      | 8.025      | 10           | 9            |
| V (2)               | -                         | -                  | 6.138                           | 536                      | 20.186     | 4            | 3            |
| Sample              | 16                        | 6,6                | 1.173                           | 501                      | 2.424      | 18           | 12           |

OOP: Out-of-pocket, TCP: total capacity to pay, HEs: household expenses  
20.3 MXN= 1 USD (Jun 2018) Source: elaborated by the authors.

chase of medicines representing roughly half of total household health expenditures.<sup>19,20</sup>

Furthermore, the patients in our study sample were could access to health interventions (hospitalization, auxiliary diagnosis studies and medicines) by the SP; according to the Ensanut, 37.4% of the total Mexican population in that period was affiliated with the SPSS.<sup>18</sup> The objective of this public health insurance program, in effect during the study period, was precisely to offer financial assistance with the aim of ensuring access to health services for the uninsured population.

Our findings regarding that the highest percentage of households are concentrated in the poorest quintiles, coincide with that reported by several studies, in which TCP is used as a proportion of OOP health expenses to determine catastrophic expenses; for example, a catastrophic expenditure prevalence of 13.6% has been described, with a high proportion in poor quintiles.<sup>21,14</sup> Another example is the analysis of various insurances schemes in China, in which the incidence of catastrophic spending is 15.53% in rural population with the threshold 40% TCP.<sup>22</sup>

Thus, the TCP allows us to identify the effect of financial protection scarcity in poor households, contrary to the method shared budget used by the Objectives to Sustainable Development with thresholds of 10 and 25% of the available budget, which identifies catastrophic expenses more frequently among the richest households.<sup>12,14</sup>

In addition, not surprisingly, it has been reported that the households of patients with mental disorders suffer more social disadvantages than households without mentally ill patients.<sup>23</sup> Our study supports these findings, since the poverty line of the population analyzed was lower than that reported in Mexico.<sup>17</sup> This situation could be a consequence of the lack of work activity of patients caused by their illness. Other authors have documented that in households of patients with mental disorders, up to a third are affected by CEs, double that of households without members with this type of health problem.<sup>24</sup>

Another factor that influences to incur in OOP expenses, is the poor access to health services. According to our findings, this situation possibly reduces the access to medicines and outpatient consultation provided by the SP. It has been reported that the benefits of SP in terms of reducing OOP expenses for health are associated with the type of health facilities to which the user has access, particularly in poor or rural households where the possibility to have catastrophic expenses is high.<sup>25,26</sup>

The heterogeneous effect of the SPSS should be adjusted in the recent reforms to the health system.<sup>27</sup> Accordingly, our work demonstrates that one of the

main challenges facing will be guaranteeing effective and efficient access to medications (antipsychotics, antidepressants, etc.) and hospitalization, to mitigate OOP expenses in backgrounds of schizophrenia patients. In this sense, guaranteeing these interventions could reduce catastrophic expenses between 13 and 19%.<sup>28</sup>

The present empirical study highlights the effect of OOP expenses in a restricted sample, so that there is a limitation that the results cannot be extrapolated to larger populations; annualizing is another possible bias.

## Declarations

We conducted this study in conformity with the STROBE guidelines

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*Declaration of conflict of interests.* The authors declare that they have no conflict of interests.

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