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Access to medication in Mexico: financing and equity

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Acceso al medicamento en méxico: financiamiento y equidad

Aceso ao medicamento no México: Financiamento e Equidade

L'accès aux médicaments au Mexique : le financement et l'équité

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ORIGINAL ARTICLE

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Abstract

Objetive: The objective of this paper is to analyze the equity on the financing and access to medication in Mexico, in a context of growth in the market of t generic drugs. It also shows the level of prices and costs of diabetes treatment.

Materials and Methods: This study is based on the national survey about the income and expense of households from 1998 and 2010. The Heckman model was used. This type of model has two stages: the first estimates the probability that the household make an expense on medications, while the second stage uses an Engel Curve model to explain the budgetary allocation of drug spending.

Results: The poorest households without social security have an expense in medication relatively higher than the rest of the population. The cost of diabetes treatment with drugs without patent is too high. According to the results if the drug spending of a household income increases by 100% it is reduced by 11.79% in 1998, while in 2010 it drops in 11.59%. The estimation of this demand equation according to the theory of the consumer indicates that the introduction of generic drugs has brought a wealth effect since 2010 households consume more medication, just as predicted.

Conclusion: The benefits of access to medicines may not be available on an equitable way. The poor households may not have the opportunity to achieve good health when it is affected by a disease which requires expensive medications or has a lifetime treatment and a great part of the household income is destined to it which makes them become poorer; this has a negative impact on social justice.

Keywords: Access, inequality, inequity, financing, and prices

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Resumen

Introducción: El objetivo de este trabajo es analizar la equidad en el financiamiento y acceso a los medicamentos en México, en un contexto de crecimiento en el mercado de los medicamentos genéricos. Asimismo se muestra el nivel de precios y costo del tratamiento en diabetes.
Material y Métodos: El estudio se realiza con base a la encuesta nacional sobre el ingreso y gasto de los hogares en el período 1998-2010. Se usa el modelo de Heckman. Este modelo tiene dos etapas: en la primera se estima la probabilidad de que una familia realice un gasto en medicamentos, mientras que en la segunda se estima un modelo de la curva de Engel para explicar la asignación presupuestaria familiar en medicamentos.
Resultados: Los hogares más pobres, sin seguridad social, tienen un gasto en medicamentos relativamente mayor que el resto de la población. El costo del tratamiento para la diabetes con medicinas sin patente es muy elevado. La estimación de la curva de demanda de acuerdo a la teoría del consumidor indica que la introducción de medicamentos genéricos ha generado un efecto riqueza de acuerdo a los postulados de la teoría, pues se observa un mayor consumo de medicamentos en 2010.
Conclusiones: Los beneficios del acceso a los medicamentos no muestran un patrón equitativo. Las familias más pobres no tienen la oportunidad de lograr una buena salud cuando sufren de una enfermedad la cual requiere gastos en medicamentos costosos o tratamientos a lo largo de su vida lo cual le afecta a sus bajos ingresos, lo que lo hace más pobre: esto tiene un impacto negativo en la justicia social

Palabras clave: Acceso, desigualdad, inequidad, financiamiento y precios

Resumo

Objetivo: O objetivo deste artigo é analisar a equidade no financiamento e acesso a medicamentos no México, em um contexto de crescimento no mercado de medicamentos genéricos. Assim como o nível de preços e custos do tratamento da diabetes também é mostrado.
Materiais e métodos: O estudo foi realizado com base na enquête nacional sobre o rendimento e as despesas das famílias no período 1998-2010. É usado o Modelo de Heckman. Este modelo tem duas fases: em primeiro lugar estima-se a probabilidade de que uma família faça uma gastos com medicamentos, enquanto na segunda estima-se um modelo da curva de Engel para explicar o orçamento familiar em medicamentos.
Resultados: Os lares mais pobres, sem segurança social, têm um gasto relativamente mais elevado do que o resto da população. O custo do tratamento para a diabetes com medicamentos sem patente é muito alto. A estimativa da curva de demanda de acordo com a teoria do consumidor indica que a introdução de medicamentos genéricos gerou um efeito riqueza de acordo com os princípios da teoria, pois observa-se um maoir consumo de medicamentos em 2010.
Conclusão: Os benefícios do acesso aos medicamentos não mostram um padrão equitativo. As famílias mais pobres não têm a oportunidade de alcançar uma boa saúde quando sofrem de uma doença que requer gastos com medicamentos caros ou tratamentos ao longo de sua vida o qual afetarão a sua baixa renda, tornando-o mais pobre: isto tem um impacto negativo sobre a justiça social.

Palavras-chave: Acesso, desigualdade, iniquidade, financiamento e preços

Résumé

Objetivo: Le but de cet article est d'analyser l'équité dans le financement et l'accès aux médicaments au Mexique. Aussi le niveau de prix et le coût du traitement du diabète est également indiqué.
Materiais e métodos: L'étude a été menée sur la base de l'enquête nationale sur le revenu et les dépenses des ménages dans la période 1998-2010. Le modèle Heckman a été utilisé. Ce modèle comporte deux étapes: dans la premiere étape on estime d'abord la probabilité qu'une famille fasse une dépense en médicaments, tandis que dans la seconde étape on estime un modèle de la courbe Engel pour expliquer la répartition du budget de la famille en médicaments.
Résultats: Les ménages pauvres sans dépenses de sécurité sociale ont relativement une dépense plus élevée des médicaments que le reste de la population. Le coût du traitement du diabète avec des médicaments sans brevet est très élevé. L'estimation de la courbe de la demande, selon la théorie des consommateurs indique que l'introduction de médicaments génériques a généré un effet de richesse selon les principes de la théorie, parce qu'on observe qu'il y a une majeure consommation des médicaments depuis 2010.
Conclusão: Les avantages de l'accès aux médicaments ne montrent pas aucune tendance équitable. Les familles les plus pauvres ne possèdent pas la possibilité d'atteindre une bonne santé quand ils souffrent d'une maladie qui les fasse dépenser en médicaments ou des traitements tout au long de sa vie, ce qui affectera ses bas revenus et qui les rendra plus pauvres : cet effet-ci a un impact négatif sur la justice sociale.

Mots-clés: Accès, l'inégalité, l'iniquité, le financement et les prix

Introduction

The drug issue is a matter of which sufficient importance is not given on the agenda of the public health, despite occupying a very important place in health spending. The medication is a fundamental element in the prevention and treatment of any disease. At the beginning of the third millennium, a third of the population in the world lacks a regular and reliable access to drugs and even to essential medicines. The access problems are linked to the distance of homes to the health centers, level of education, cultural beliefs, infrastructure, availability, and forms of financing.

Developed countries, when they define the ways of medicine financing, as well as the financing of health services, avoid that this affects patients' economy. Most of this expenditure is made by some scheme of co-pay or subsidies to vulnerable groups. But in non-industrialized countries, the main way of financing comes from the families' income [1].

Based on the WHO ('World Health Organization') calculation, it is estimated that in developed countries 19.5% of the health spending is used on drugs while in developing countries this expenditure goes on a range from 23.1% to 30 [2]. In addition it should be noted that 2/3 parts of the medication is spent on public funding, while the opposite happens in developing countries where the source of funding is the households' income, as in the case of Mexico where it is estimated that 85% of the medicine spending comes from it. Given this characteristic, it is important to analyze the prices of drugs and spending from households' income belonging to a social security scheme, as well as the influence of socio-economic characteristics such as age, sex, house right and settlement in the rural or urban environment.
In the health subject it has traditionally been associated reduction of inequalities to equity, although this is not a question only of the reduction of inequalities. In this context, inequality in health is not synonymous with health inequity. The term of 'inequalities' in health subject does not reflect precisely the problem. Inequalities is the term used to designate differences, variations, and differences in the health achievements of individuals and groups. While 'inequities' refer to inequalities in health that are considered unfair, unacceptable or derived from some kind of injustice. The nobel prize in economics Amartya Sen points out that equity should be seen from a multidimensional approach where equity in health is not either the distribution of health or the distribution of health care being the most limited subject. You must take into account how health relates with other features through the allocation of resources and social

arrangements [3].

In general terms, health financing options are not neutral in relation to equity. Public funding of health services related to social security schemes or via tax services is a more equitable way of funding. On the other hand, direct charge is the most regressive and inequitable financing way. Experience indicates that fees represent a high economic barrier to access to health services. In this way, the concept of inequity in funding can be linked with the proportion of family income that each group spends on health care.

In Mexico, the society is divided into rural and urban environment, and into workers with formal and informal employment [4]. Similarly, on the one hand, health services are divided into services in social security, with the free provision of medications, for workers with formal employment. On the other hand, the services for the population with fewer resources and quality for the people without formal employment to whom the 'Seguro Popular' was opened as a way of access to a basic package of health services [5]. Half of the population has no formal employment, a great proportion lives in rural areas and has no social security coverage so they have to buy their drugs with their income [6], to high prices, in a market that control the big pharmaceutical companies, which are beginning to face competition from generic drugs [7].

The objective of this paper is to analyze the financing and access to medication in Mexico, in a context of generic drugs increasing share of the total drug market. To achieve this objective, we choose families who were spending on pharmaceuticals examining the relationship that keeps some economic, socio-economic and demographic characteristics and estimate how much spent as a proportion of their income in special the poor families by comparing two years 1998 and 2010, due that at the end of the 90´s the generic drugs are growing.

In this study context, we are assuming that the introduction of generic drugs at the end of the 90's allowed the poor people to improve their access to medicines, nonetheless the poor people still devote a larger share of their income to buy essential drugs, which is unfair.

Materials and methods

This paper shows some characteristics on the financing and acess to medicines in Mexico, and the pricing policies of the pharmaceutical industry in the case of diabetes treatment. For the pricing policies we compare

prices of the leading drugs related with diabetes pharma treatment. Some features of the ways of access to medicines according to the expenditure of families are also examined. The National Survey on Household Incomes and Expenses (ENIGH in Spanish) is used for this 8. The selected years were 1998 and 2010 in order to check if there are significant differences in the use of drugs in homes since in the first year just began the introduction of interchangeable generic drugs and the second year because it is where you can see an increase in the use of similar and generic drugs because the market for them is already consolidated.

We considered a curve of Engel where it tries to explain the budgetary allocation of drug spending9. It is carrying out an estimate of demand according to the theory of the consumer. To illustrate the behavior of drug spending in households, the Heckman model was used. This model correct the biased estimates of the sampling selected, this bias is originated by the autoselection of these households that decide to spend in pharmaceuticals and those who do not10. If we use the least square method, instead the Heckman model, will get biased coefficients, due that the households that spend in drugs are part of the population that have monetary income to do it. The Heckman method consists of two stages: the first one is a probit model, which it is estimated to calculate the probability of being in the sample of individuals who were spending on drugs, at this stage will capture the effect treatment which tends to vary between individuals according to their characteristics (economic, socio-economic and demographic), this stage gets the inverse ratio of Mills that captures the magnitude of the bias, between individuals who made a spending on drugs and those who do not. In this sense are considered two equations in the model, an equation of interest which we named as a curve of Engel, which explains the budgetary allocation of spending on medicines when changing consumer income, and a second equation that corresponds to a model of discrete choice (Probit or Logit) which measures the probability of being in the sample, which is estimated in the first stage of the model.

The first stage only indicates whether it occurred or not some drug spending (GASMED) and is based on the following characteristics: logarithm of common income (LING); The square of the logarithm of the common income (LING2); Male members of the household (HOMBRES); Female members of the household (MUJERES); Members of the household that are 12 years old or more (MAYORES); Members of the household that are 11 years old or less (MENORES); Affiliation to social security (DERHAB). The second stage indicates the budget allocation of household medicines (GTOMED).

Results

The results of tables 1 and 2 contain projections of parameters, standard errors, z-statistical, p-value of the contrast of significance of the variables, the inverse of Mills and the rank of correlation between the first and the second stage measured by rho. In relation to the results it is observed that most of the coefficients are statistically significant at both stages. Once the first stage confims that home effectively earmarked drug spending and that this is explained by socio-economic and demographic characteristics of household; it moves on to the second stage where shows what amount was assigned from household income. At this stage, you can see that the poorest households spend more on medication since LING negative coefficient indicates that having a higher household income brings less drug spending as a consequence.

Table 1. Projection year 2010   Table 2: Projection year 1998

Source: own projection.

Using the projection results - for both years - the marginal effect was calculated to have the total marginal effect, which indicates the percentage of drug spending in households. According to the results of table 3, if the drug spending of a household income increases by 100% it is reduced by 11.79% in 1998, while in 2010 it drops in 11.59%. The estimation of this demand equation according to the theory of the consumer indicates that the introduction of generic and similar drugs has brought a wealth effect since 2010 households consume more medication, just as predicted; while in 1998 they had a budget allocation of 18.6%, in 2010 it almost doubles to 37.3 %.

Table 3. Effects on the consumption of drugs and projection.
Mexico, households 1998 and 2010

Year	2010	1998
Variable	Marginal effect	Marginal effect
LING	-60.45619	-20.31989
LING2	2.607725	0.8619324
Marginal effect total (ET)		
$ET = \dfrac{LING}{2*LING2}$	-11.59%	-11.79%
Projection		
Budget allocation	37.27462%	18.6471%

Source: own projection.

Drug spending in Mexican households by income decile: 1998 and 2010.

Figure 1 shows the drug spending as a percentage of goods and services spending by house right category. By 1998, three groups that have an irregular distribution of drug spending in households were observed. The group that does not have a social security has a spending limit of 25% and a minimum expenditure of 0% it is recorded in the other groups. The average was different in the three groups, being the group that does not have a social security the largest one (4%). In 2010 it is shown by type of house right the drug spending as a percentage of goods and services spending. Households without social security and population assigned to the 'Seguro Popular' spend the most. This indicates that despite the inequality in health care distribution has been reduced, it has no impact in the reduction of health inequity because access to health services via 'Seguro Popular' with a basic package of services does not guarantee that poor people do not have to spend more on the purchase of medication in comparison with people who have a higher income. See Figure 1.
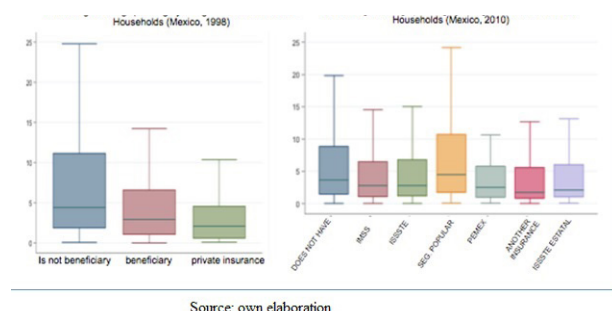

Source: own elaboration.

Figure 2 shows a comparison of drug expenditure as a percentage of the household income in 1998 and 2010. By 1998, it is appreciated that this spending has a descending behavior as the household is located in the upper income group. This is to say that in that year the poorest households were those who spent a higher proportion of their income on the purchase of drugs. The introduction of 'Seguro Popular' in 2005 has not changed this situation since the survey of 2010 - that already has the information of households with such help- the poorest households remain being the ones who spend more in relative terms. In figure 2 is also observed that the first two deciles of income are the ones who spend a great part of their income on the drug purchasing, both beneficiaries such as those who are not, in a greater proportion are the last. This situation is interesting because it is precisely this population group the objective of the 'Seguro Popular'.

Figure 2. Drug spending by deciles of income (1998 and 2010)

Source: own elaboration
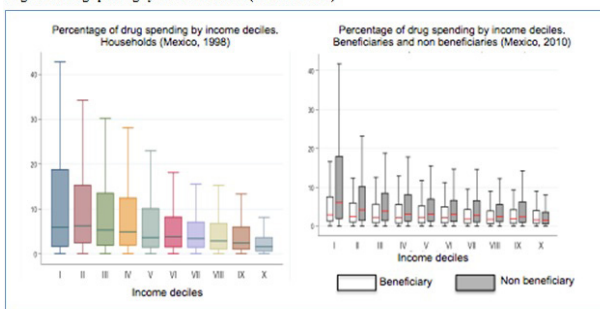
Based on the information from the survey, it is estimated that the first two deciles spent 39% of drug spending in households in 1998, and this participation encreased to 47% in 2010.

In the case of diabetes the costs were estimated to a daily treatment in 2010 in the case of three active substances: glyburide, metformin, and tolbutamide. The calculation was estimated to the product with the leading brand, generic substance and the generic version published in Management Science Price Guide[11]. Glibenclamide showed a difference of 5 times more in prices between the leading brand and its presentation at the international level; the difference in the metformin raised to 50 times more and tolbutamide recorded a difference of 5.5 times more. Differences between international prices and generic presentations in Mexico were reduced to half.

Conclusion

It is disturbing to think that all the benefits of access to medicines may not be available on an equitable way. According to the graphic analysis and the results of the projections, if ethical value judgments are added to this way of distribution of drug spending, the poorest households are the ones who actually should not happen to spend from their income for the purchase of medicines. These households may not have the opportunity to achieve good health when it is affected by a disease which requires expensive medications or has a lifetime treatment and a great part of the household income is destined to it which makes them become poorer; this has a negative impact on social justice. The high diabetes treatment cost with active popular substances shows the enormous power of the big pharmaceutical companies market, that with a poor national regulation they impose a heavy financial burden on the population; in a country like Mexico which has a segmented and inequitable health system and where it excludes the poor and

unemployed population from good health services.

The best availability of drugs on the market should mean a way to redistribute the access to this new technology and that a greater population benefited from this situation which would have repercussions on the reduction of inequities in health in Mexico. In this study when we compare the year 1998 just starting the generics market families spent approximately 11% of their income keeping this percentage to 2010 when this consolidated generics and similars market. However, in the last year the entry of cheaper medicines has produced a wealth effect because households can buy a greater number of medication and therefore it has a better access to them. Another aspect to mention is that in Mexico they have almost a universal coverage of health services wth the 'Seguro Popular' but this sure has not removed the expense in the population with low income. So the right that people have to achieve good health requires social arrangements that cover a bigger range than the health care distribution, where access to medication is not carried out according to the level of income of the population.

References

1.   WHO, HAI. Measuring medicine prices, availability, affordability and price components. Geneva: WHO/PSM/PAR;2008.   http://www.who.int/medicines/areas/access/OMS_Medicine_prices.pdf

2.   Lu Y., Hernandez P., Abegunde, D. et al. The World Medicines situation 2011. Geneva: WHO; 2011.

3.   Sen A, Kliksberg A. Primero la Gente. Una mirada desde ética del desarrollo a los principales problemas del mundo organizado. Madrid: DEUSTO;2007

4.   Barba, C. Regímenes de bienestar latinoamericanos: ¿universalismo o focalización?. En Calva, J editor, Derechos sociales y desarrollo incluyente. Análisis estratégico para el desarrollo. México: Juan Pablos; 2012.

5.   Organización de Cooperación para el Desarrollo Económico. Estudios de la OCDE sobre los sistemas de salud: México. París: OCDE; 2005

6.   Narro J, Moctezuma D, Orozco L. Hacia un nuevo modelo de seguridad social en Economía UNAM, vol. 7; Supl 7-33:2010. http://www.scielo.org.mx/scielo.php?script=sci_issuetoc&pid=1665-2X20100003&lng=es&nrm=iso

7.   Molina R, Carbajal C, González E. Competencia y precios en el mercado farmacéutico mexicano in Salud Púb Méx, vol. 50;Supl 4:S496-S503 http://www.scielosp.org/pdf/spm/v50s4/11.pdf

8.   Instituto Nacional de Estadística y Geografía. Encuesta Nacional de Ingresos y Gastos de los Hogares (ENIGH). México: INEGI [consulted 2015]. Available: http://www.inegi.org.mx/est/contenidos/proyectos/encuestas/hogares/regulares/enigh/default.aspx

9.   Arcarons J, Calonge S. Microeconometría introducción y aplicaciones con Software econométrico para Excel. Madrid: Delta Publicaciones, 2008.

10.   Arcarons J, Calonge S. Microeconometría introducción y aplicaciones con Software econométrico para Excel. Madrid: Delta Publicaciones, 2008.

11.   Management Sciences for Health. International drug price indicator guide, Boston: MSH; 2010