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Evolution of health coverage in Mexico: evidence of progress and challenges in the Mexican health system

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ABSTRACT

To consolidate an effective and efficient universal health care coverage requires a deep understanding of the challenges faced by the health care system in providing services demanded by population in need. This study analyses the dynamics of health insurance coverage and effective access coverage to some health interventions in Mexico. It examines the evolution of inequalities and heterogeneous performance of the insurance subsystems incorporated under the Mexican health care system. Two types of coverage indicators were selected: health insurance and effective access to preventive health interventions intended for normative population. Data were drawn from National Health and Nutrition Surveys 2006 and 2012. The economic inequality was estimated using the Standardized Concentration Index by household per capita consumption expenditure as socioeconomic-status indicator. Approximately 75% of the population reported being covered by one of the existing insurance schemes, representing a huge step forward from 2006, when as much as 51.62% of the population had no health insurance. About 87% of this growth was attributable to the expansion of Non Contributory Health Insurance whereas 7% emanated from the Social Security subsystem. The results revealed that inequality in access to health insurance was virtually eradicated; however, traces of unequal access persisted in some subpopulations groups. Coverage indicators of effective access showed a slight improvement in the period analysed, but prenatal care and interventions to prevent chronic disease still presented a serious shortage. Furthermore, there was no evidence that inequities in coverage of these interventions have decreased in recent years. The results provided a mixed picture, generalizable to the system as a whole, expansion of insurance status represents one of the most remarkable advances that have not been accompanied by a significant improvement in effective access. In addition, existing inequalities are part of the most important challenges to be faced by the Mexican health system.

Key words: Effective access, health insurance, health systems, inequality, Mexico

Key Messages

- Health systems' performance tends to be heterogeneous, thus it is important to assess the effectiveness of each subsystem on specific population groups.
- While insurance coverage indicators are necessary thresholds they are not sufficient. Effective coverage and effective access to health interventions needs to be evaluated, with emphasis on how able is the system to respond to population needs.
- To achieve universal health coverage implies not only expand opportunities for access to health interventions, it is also required to assess the progress of the health system in reducing gaps in health inequality.

Introduction

With the dawning of the new century, the Mexican government initiated a far-reaching reform process as cornerstone for the construction of a health system that extends the benefits of medical insurance to the unprotected population, thus tackling the critical issues of inequity and inefficiency observed by the World Health Organization (WHO 2000; Frenk *et al*. 2006). Under the reform process was the creation of the Social Protection System in Health (SPSS for its initials in Spanish) in 2004, an initiative which has reshaped the architecture of the Mexican health system. This was the first attempt in the country to provide a universal health system capable of operating to some extent independently from the formal labour market.

Currently the Mexican health system consists mainly of two public health insurance instruments[1]: the Social Security scheme, which is linked to the formal labour market, and the Popular Health Insurance scheme (*Seguro Popular* in Spanish), which is primarily funded with general taxes and targets the rest of the population, particularly the poorest segments. Over 95% of the insured population falls under these two schemes; the rest is covered by the private sector with marginal participation. Along with the reform process, a monitoring and evaluation system was created to make public the performance of the entire Mexican Health System, and to evaluate its progress. Although its design contemplated effective health coverage indicators as reference metrics for evaluating performance, the insurance coverage indicator has been the foremost criterion of progress in Mexico's transition towards universal health coverage in the last years. With the arrival of the new government in 2012, the effective access to health interventions emerges as one of the main objectives of the health policy.

Although the effective coverage indicators that take into account the principal aspects of the service provision process—namely the level of utilization and the quality of services offered—constitute the optimal metrics for judging the success of the system (WHO 2001, 2003; Shengelia *et al*. 2005), only a handful of studies have documented the effective coverage levels of health interventions in Mexico. Some authors have addressed the substantially heterogeneous performance of the Mexican health care system (Lozano *et al*. 2006; Mexican Ministry of Health 2006; Martínez *et al*. 2011; Gutiérrez 2012). Nonetheless, most analyses have explored what could be referred to as the initial phase of the reform, which concluded in 2006, reporting mainly distributional aspects rather than providing an inter-temporal perspective of the evolution of indicators. The objectives of this study are to analyse the dynamics of health insurance coverage and effective access coverage to some health interventions. It also examines the evolution of inequalities in health care coverage and explores the heterogeneous performance of the insurance subsystems incorporated under the Mexican health care system. We hope that our findings will contribute to a deeper understanding of the challenges and opportunities that systems comparable to the Mexican health care system face in their efforts to consolidate effective and efficient universal health care coverage.

Methods

Defining coverage indicators

This study analysed two types of coverage indicators: one concerning health insurance and the other effective access to health interventions.

Health insurance coverage was measured according to respondents' self-reported enrolment within one of the health insurance subsystems in Mexico. The **most comprehensible definition of effective coverage** uses as indicator the fraction of the maximum possible health gain expected by an individual in view of his/her needs (Shengelia *et al*. 2005; Lozano *et al*. 2006). Alternatively, this study evaluated coverage only in terms of access to a set of primary-care-related interventions, and in order to do so, identified which population groups would benefit from the interventions listed under the National Health Card (CNS, for its Spanish initials). CNS is an instrument indicating the particular package of health prevention and promotion actions that should be guaranteed to specific population groups—some classified according to their age and gender, others to their particular health needs (Mexican Ministry of Health 2011). The CNS 'guaranteed package' is part of the group of official primary-care interventions, it is delivered by all public health insurance subsystems, and is considered an essential component of the transition to universal health coverage (WHO 2008).

Effective access coverage was assessed according to the fraction of the population entitled to, and actually receiving, health intervention actions. Individuals were considered eligible for, or in need of, receiving intervention where the health gain expected from the utilization of such intervention was greater than zero (Colston 2011). The concept of need was linked to the CNS population groups, considering either their age and gender, or a previously reported diagnosis of a health condition such as pregnancy or diabetes. Coverage in terms of effective access to health interventions is formally expressed in the study as:

$$EC_{ip} = (U_{ip}/N_{ip})xQ_{ip}$$

where EC_{ip} was effective coverage regarding **access** to intervention i in population p; N_{ip} the number of individuals in need for intervention i in population p; U_{ip} the number of individuals in need for intervention i who actually received it and Q_{ip} the adjustment for the quality in health care delivery. In the analyses based on access indicators, quality adjustments were carried out only where detailed information on actions received was available. In the absence of such information, we used the expression in parenthesis to designate the utilization or crude coverage indicator for the fraction of

individuals needing intervention i who actually utilized it, without taking into account the quality of the health care process. In this framework, the main difference between the effective coverage and effective access coverage is how the quality component is measured. While effective coverage measures the potential effects on the individual's health, the effective access coverage only focuses on quality of the care process.

The reason for not analysing the most comprehensible effective coverage indicators was that they take into account quality in terms of expected improvement in the health conditions of the population. As affirmed by Lozano *et al.* (2006), measuring quality poses major measurement challenges, since analyses must identify which changes in the health conditions of individuals are directly attributable to the interventions received. Also, if satisfaction aspects and expectations of health services and processes are considered, measuring quality becomes extremely complex or even subjective. With insufficient data, it is difficult to evaluate how much of the health gains observed derive from interventions and how much from other factors. Although certain short-term health outcomes allow estimating health gains through process indicators, in general, rigorous evaluations of effective coverage indicators are infrequent.

To take into account the differences between the Social Security[2] and the *Seguro Popular* affiliation processes, the study compared their access coverage levels controlling for age, gender, average education level of household members, if household was enrolled in *Oportunidades* programme,[3] rural condition, and socioeconomic region of affiliated households.[4] The adjusted analysis[5] sought to minimize the potential bias for selectivity by controlling for factors identified in the economic literature as the most relevant in health care demand (Cameron *et al.* 1988; Gertler and van der Gaag 1990; Deolalikar 1998; Acharya *et al.* 2012). Table 1 presents the access coverage indicators analysed in the study. Regarding some indicators, the lack of information restricted adjusting for health care delivery quality. In such cases, the standpoint was crude access or utilization coverage. All coverage indicators were constructed as binary variables and were statistically estimated with population representativeness.

The data collected from the information reported by the respondents and their households during the 2006 and 2012 rounds of the National Health and Nutrition Survey (ENSANUT for the survey initials in Spanish). Both surveys were cross-sectional and used a probability and stratified sampling design to obtain nationally representative estimators. Their objective was to offer detailed information on the health conditions of the Mexican population. ENSANUT 2006 surveyed 206 700 individuals residing in 47 152 households, and ENSANUT 2012, 194 923 individuals residing in 50 528 households. Their design makes both rounds comparable; the formulation of the questions in the questionnaires is the same for most variables.

Measuring economic inequality in health

Analyses of economic inequality in health indicators require a well-being or income measurement for ranking the population. Given the limited economic data provided by ENSANUT, a household socioeconomic-status (SES) index was constructed using an indirect estimation methodology with parameters from other sources of information. The study adopted a methodology based on assessment techniques which are widely used in the 'Proxy Means Test' literature (Glewwe and Kanaan 1989; Grosh and Baker 1995; Coady *et al.* 2004), trying to describe the level of household wellbeing according to its correlation with other sociodemographic characteristics of the household and its environment.

The household per capita consumption expenditure, adjusted for adult equivalent scales, served as SES indicator and was constructed in two phases. First, household per capita expenditure was modelled according to data from the 2006 and 2012 National Household Income and Expenditure Surveys (ENIGH for the survey initials in Spanish). Both surveys are cross-sectional and nationally representative, offering detailed information on the income and expenditure levels of Mexican households. Second, the estimated per capita consumption expenditure level for each household under ENSANUT 2006 and 2012 was imputed using the coefficients obtained by analysing ENIGH 2006 and 2012, respectively (see Supplementary Appendix for further details).

The economic inequality levels of the coverage indicators were estimated using the Standardized Concentration Index (CI_{std}) proposed by Wagstaff *et al.* (2005). The Index was adapted to binary indicators with values of 1 and 0, as originally developed by Wagstaff *et al.* (1989) and Wagstaff *et al.* (1991). A CI_{std} estimate and its standard error were obtained for each coverage indicator, using an OLS convenient regression, according the empirical specification proposed by Kakwani *et al.* (1997):

$$2\sigma_r^2\left(\frac{h_i}{\mu(1-\mu)}\right) = \alpha + \beta r_i + \varepsilon_i$$

where σ_r^2 is the variance of $r_i = 1/N$, which in turn, was the fractional rank of individual i in the SES distribution, with $I = 1$ for the poorest and $I = N$ for the richest; h_i was the health variable; μ the average of h, and β the $CI_{std.}$ estimator. The index was standardized through $(1-\mu)$ in order to avoid dependence of CI limits on μ. All calculations considered sample weights.

CI_{std} provides a better measure for quantifying health inequality than the percentile stratification approach typically used to compare means, because it captures the behaviour of the entire population across the SES distribution, it is more sensitive to extreme values, and allows for a better comparison over time. The CI_{std} rank is bounded between -1 and 1, where the limits denote total concentrations at either the poorest or the richest population level, and 0 denotes absence of inequality.

Results

Health insurance coverage

Table 2 compares the evolution of health insurance coverage among public health subsystems. At the individual level, approximately 75% of the Mexican population (~85.6 million) in 2012 reported being covered by one of the existing insurance schemes. As has been widely documented (Knaul *et al.* 2012; Mexican Health Foundation Working Group 2013), this represents a huge step forward from 2006, when as much as 51.62% of the population had no health insurance.

At the family level, the number of all-insured households jumped 60% between 2006 and 2012. It should be noted that in 2012 there were 4.3 million totally unprotected households. Besides, some 7.6 million households, or 25.8% of total households in Mexico, were only partially insured, meaning that one or more family members had no health insurance of any type.

On the subsystems analysis, it was found that in 2012, ~36.8% of the people were enrolled with Social Security, and a similar percentage with *Seguro Popular*. It is worth noting that 87% of growth in insurance coverage between 2006 and 2012 was attributable to

Table 1. Definition of effective access coverage indicators

Intervention	Population in need	Crude and utilization	Effective access
Postnatal care	Newborns[a]	Children having received medical assistance at birth	
	Children under 1	Children having received well-child examinations	Report of having received counselling on how to stimulate the child's growth and development at home
Vaccination schedule	Children under 5	Children having received vaccination cards	Completed basic vaccination schedule for her/his age
Prenatal care	Women with live-born children[b]	Women having attended at least 4 prenatal visits with a health care provider	Report of having received the following prenatal care actions: measurement, weight, blood pressure, general urinalysis, blood tests, blood glucose level, ultrasound, tetanus vaccine, folic acid screen, blood test for iron level and syphilis detection
Diabetes control	Adults over 20 with diabetes diagnoses	Adults with diabetes diagnoses who self-reported having taken insulin, pills or both	Information not available
High blood pressure Control	Adults over 20 with high blood pressure diagnoses	Adults with high blood pressure diagnoses who self-reported having taken hypertensives	Information not available
Papanicolaou test	Women over 25	Women having taken Pap tests in the last 2 years	Information not available
Clinical breast examination		Women having attended manual breast exams in the last 2 years	Information not available
Influenza vaccination	Adults over 60	Older adults who self-reported having received Influenza vaccines	Information not available

[a]Only children born in the 12 months prior to the survey were considered.
[b]Only children born in the 18 months prior to the survey were considered.

Table 2. Insurance coverage

	2006		2012	
	N[a]	%	*N*[a]	%
Individual				
Social security	35.8	34.8	42.4	36.8
Seguro popular	11.0	10.7	42.1	36.6
Other	2.9	2.9	1.1	1.1
Uninsured	53.1	51.6	29.3	25.5
Total	102.8	100.0	114.9	100.0
Household				
Complete insured	8.7	36.8	17.6	59.7
Partial insured	5.9	24.9	7.6	25.8
Uninsured	9.1	38.3	4.3	14.5
Total	23.7	100.0	29.5	100.0

Source: National Health and Nutrition Survey 2006, 2012.
[a]Millions.

the expansion of *Seguro Popular*, whose thrust was heightened with the introduction of the Insurance for a New Generation[6] (SMNG for its Spanish initials) initiative, while only 7% of growth emanated from the Social Security subsystem. In contrast, other insurance mechanisms at the bottom of the ladder, namely private insurance plans, registered a 6% drop in coverage during the study period.

The exiguous contribution from Social Security to the growth of insurance coverage suggests a limited capacity of the Mexican economy for generating formal jobs and providing the social benefits established under the country's regulatory framework. Recent studies on national labour dynamics indicate that, over the past 5 years, the economically active population engaged in non-formal work[7] has escalated to almost 60% of the total working population (Levy 2008; Napoles and Ordaz 2011; INEGI 2012).

As depicted under Table 3, the expansion in insurance coverage impacted the entire population, with a slightly negative gradient correlated to age. Children under five were most favoured, with their coverage provided almost totally by *Seguro Popular*. On the other hand, notwithstanding their high priority status in public policy, children under one exhibited the steepest non-insurance rate in the entire population. The gap between their and the average national coverage rates reached nearly 9 percentage points, marking a significant divergence from the objective for which SMNG was created. With regard to older adults, expansion in coverage came out lower for those over 60.

A sensible hypothesis is that public funding changes in public health insurance subsystems would be proportional to their coverage growth rates. However, contrary to expectations, according to the National Health Accounts, in 2012, public spending allocation increased 42.8% for *Seguro Popular* in real terms, and 41.8% for Social Security[8] (Mexican Ministry of Health 2012). In a related topic, a second analysis revealed that, in 2011, public health expenditure per capita was 3.3 times higher in Social Security than in *Seguro Popular* posing important equity questions.

Inequality analyses for the years 2006–2012 revealed a historic milestone for public health policies (see Figure 1) as inequality in access to health insurance was virtually eradicated. Theoretically, at present all Mexicans enjoy the same opportunities for enrolling in a health insurance scheme regardless of their economic status. This is due primarily to the expansion of *Seguro Popular* coverage, which since its design was targeted to the needs of the poorest.

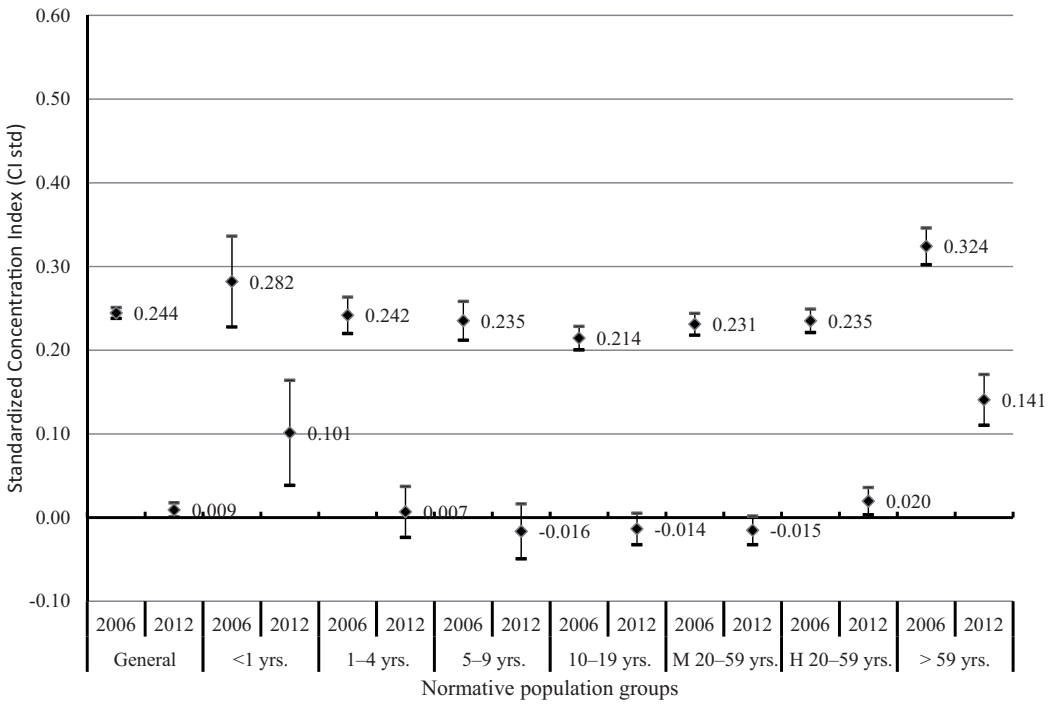
Table 3. Prevalence of insurance health coverage and the contribution to the change by insurance subsystem in different population groups

	Year	% insurance coverage	Contribution to change 2006-2012		
			Social Security Δ% (+)	*Seguro Popular* Δ% (+)	Other[a] Δ% (−)
General	2006	48.38	6.91	86.95	6.14
	2012	74.52			
Children under 1	2006	36.83	2.50	93.16	4.33
	2012	65.29			
Children 1 to 5	2006	44.25	6.01	89.02	4.98
	2012	75.73			
Children 6 to 10	2006	46.73	7.60	86.29	6.11
	2012	77.92			
Youth 10 to 19	2006	44.95	6.05	87.94	6.02
	2012	74.04			
Women 20 to 59	2006	50.49	4.28	89.19	6.53
	2012	76.32			
Men 20 to 59	2006	47.09	9.50	84.88	5.62
	2012	69.05			
Elderly adults 60 and more	2006	60.84	7.69	84.15	8.16
	2012	82.49			
Public health expenditure[b]	2006	329,687	41.84	42.78	
	2011	436,947			

Source: National Health and Nutrition National Survey 2006, 2012

[a]Includes private insurance and other institutions

[b]Source: Health National Accounts. Expenditure at constant prices 2011 (Millions of Mexican pesos)



Source: Health and Nutrition National Survey 2006, 2012

Figure 1. Insurance health coverage inequality for normative population

The analysis by age group indicated a proportional and significant decline of inequality in every group. However, traces of unequal access still persist in children under one and older adults over 60, where the poorest bear the burden of inequality. This situation is relevant in that it poses a critical risk for the system if persistent gaps are not resolved timely, especially as concerns poor children in the lowest age bracket. As for older adults above 60, being the population group with the largest number of Social Security enrollees (~51.5%), their concentration index indicated that those with no health insurance belonged primarily to the lowest economic strata.

Table 4. Coverage of effective access to preventive health interventions

Population in need	Intervention	Survey	All	Social security (A)	*Seguro Popular* (B)	Uninsured (C)	CI_{std}
Child and maternal health							
Children under 1	Skilled attendance	2006	90.76	94.78$^{\bullet}$	91.87	88.91	0.271***
		2012	91.96	95.58$^{\bullet\bullet}$	94.28$^{\bullet\bullet\bullet}$	86.8	0.268***
	Monitoring child health (crude)	2006	86.21	92.42$^{\bullet\bullet}$	87.51	83.39	0.316***
		2012	78.28	84.65$^{\bullet\bullet}$	78.79$^{\bullet\bullet}$	72.82	0.147***
	Monitoring child health (effective access)	2012	53.77	67.27$^{\$\$\$,\bullet\bullet\bullet}$	51.35	45.63	0.144***
Children under 5	Vaccination schedule	2006	97.46	97.85	98.31$^{\bullet\bullet}$	97.02	0.080*
		2012	97.59	97.97$^{\bullet\bullet}$	97.88$^{\bullet}$	96.66	0.033
	Basic vaccination schedule	2006	72.41	73.18	76.07$^{\bullet\bullet}$	71.39	0.050***
		2012	79.80	84.99$^{\$\$\$,\bullet\bullet\bullet}$	80.43$^{\bullet\bullet\bullet}$	72.82	0.030
Women with live-born children	Prenatal care (crude)	2006	86.74	92.23$^{\bullet\bullet}$	86.26	82.88	0.337***
		2012	90.72	95.31$^{\bullet}$	89.92$^{\bullet}$	86.3	0.305***
	Prenatal care (effective access)	2012	54.02	64.04$^{\bullet\bullet\bullet}$	52.25$^{\bullet}$	45.63	0.139***
Adult health							
Women over 25	Papanicolaou test	2006	41.22	45.13$^{\bullet\bullet\bullet}$	52.32$^{\bullet\bullet\bullet}$	34.45	−0.004
		2012	55.23	58.73$^{\$\$\$,\bullet\bullet\bullet}$	58.21$^{\bullet\bullet\bullet}$	40.51	0.077***
	Clinical breast examination	2012	36.79	45.29$^{\$\$\$,\bullet\bullet\bullet}$	32.37$^{\bullet\bullet\bullet}$	24.32	0.166***
Adults over 20 with diabetes diagnoses	Diabetes control	2006	81.22	82.99	84.76$^{\bullet\bullet\bullet}$	77.17	−0.053
		2012	85.76	88.04$^{\bullet\bullet\bullet}$	86.88$^{\bullet\bullet\bullet}$	74.47	−0.015
Adults over 20 with high blood pressure diagnoses	High blood pressure control	2006	58.46	67.72$^{\$\$,\bullet\bullet\bullet}$	55.88$^{\bullet\bullet}$	47.73	0.187***
		2012	68.53	76.01$^{\$\$\$,\bullet\bullet\bullet}$	62.8	54.94	0.067***
Adults over 60	Influenza vaccination	2006	43.82	49.35$^{\bullet\bullet\bullet}$	49.13$^{\bullet\bullet\bullet}$	36.12	0.037*
		2012	59.09	60.82$^{\$\$\$,\bullet\bullet\bullet}$	61.67$^{\bullet\bullet\bullet}$	48.52	−0.042**

Source: National Health and Nutrition Survey 2006, 2012.

$^{***}P < 0.01$, $^{**}P < 0.05$, $^{*}P < 0.1$ inequality significance test.

$^{\$\$\$}P < 0.01$, $^{\$\$}P < 0.05$, $^{\$}P < 0.1$ differences between subsystems A-B; $^{\bullet\bullet\bullet}P < 0.01$, $^{\bullet\bullet}P < 0.05$, $^{\bullet}P < 0.1$ differences between subsystems A-C y B-C adjusted by: age, gender, schooling, *Oportunidades* (only for 2012), rurality and socioeconomic region.

Effective coverage in access to health interventions

Interventions analysed were grouped under two main categories: maternal and child health, and chronic disease prevention in adults. Comparisons for the period 2006–2012 were performed only where available information permitted.

Maternal and child health

Skilled attendance at delivery

As outlined in Table 4, coverage for skilled attendance at delivery remained above 90% throughout the study period. The comparison of insured vs non-insured children detected no significant differences in 2006, whereas the former proved significantly higher in 2012. Additionally, no difference was found in effective access coverage between the Social Security and *Seguro Popular* subsystems. Finally, the standardized distribution of skilled attendance at delivery revealed that inequality weighed most heavily on the poorest, and remained unchanged during the study period.

Monitoring child health

Various interventions monitor the healthy development of children in their early years. This study considered as an indicator of either crude or utilization coverage if, without being ill, children were taken to checkups during their first year to assess their development and growth. Additionally, the study considered as the quality parameter of the effective access coverage indicator if, during any of the visits, the mothers or caregivers received counselling on early child stimulation at home, as explicitly provided under the CNS health promotion actions.

In 2012, 78.3% of children under age one visited the doctor to monitor their development and growth. Inexplicably, compared with 2006, coverage declined across groups, but most notably among uninsured children. On the other hand, the concentration index for the study period indicated an improvement in equitable access to medical assistance for monitoring child health.

Regarding counselling on early stimulation at home, it was observed that ~47% of the mothers or caregivers who took children to medical checkups received no counselling. Additionally, effective access coverage proved significantly greater for children with Social Security than for those with *Seguro Popular* or no health insurance, with the difference in coverage levels of up to 20 percentage points.

Vaccination schedule

According to the relevant official standard, vaccination should be available for all children under five, irrespective of their socioeconomic or insurance status. In the study, the crude coverage indicator designated children holding vaccination cards, and the effective access coverage indicator children having completed the basic vaccination schedules[9] stipulated for their ages.

The study found that, irrespective of their socioeconomic or insurance status, virtually all of the children in Mexico were provided vaccination cards. Taking into account the number of vaccines and the doses under the basic vaccination schedule, the effective access analyses demonstrated that 80% of the children completed their schedules in 2012 and this coverage had increased vis-à-vis 2006, with significant differences between insured and uninsured children. Additionally, results were significantly higher for the Social Security than for the *Seguro Popular* subsystem. Finally, as expected, the

concentration index for the study period confirmed that equitable vaccination coverage has been achieved for the entire Mexican population.

Prenatal care

Adequate surveillance during pregnancy is essential for preventing, detecting and controlling potential risk factors in the health of mothers and their newborns. In 2012, 9 in every 10 pregnant women in Mexico visited the doctor at least four times during pregnancy, thus showing a slight upward trend during the study period. Further, uninsured women registered a significantly lower utilization level than insured ones, with no difference observed between Social Security and *Seguro Popular* affiliates. Lastly, the concentration index revealed that the level of inequality in access to prenatal care was considerable, particularly among the poorest women, and remained unchanged during the study period.

Despite the high percentage of pregnant women who attended prenatal visits, the effective access coverage indicator revealed that only 6 out of 10 pregnant women actually completed the diagnostic and treatment procedures recommended by Mexican health norms. The analysis by insurance status showed significant gap between insured and uninsured mothers, reaching as many as 20 percentage points between Social Security enrollees and those with no health insurance. Finally, the adjusted analysis provided no evidence that the effective access coverage of women with Social Security differed from that of women with *Seguro Popular*.

Adult health prevention of chronic-degenerative diseases

Prevention and detection of chronic-degenerative diseases are among the highest priority health interventions directed at women. In accordance with the prevention actions outlined in CNS, women over 25 are entitled to yearly breast exploration as a means of preventing or detecting breast cancer, and to a Papanicolaou test at least once every 3 years as a means of preventing cervical cancer.

The results showed that a low proportion of women self-reported having undergone Pap tests. Even with a significant improvement of 14 percentage points between 2006 and 2012, only 6 out of 10 insured and four out of 10 uninsured women had taken the test. Additionally, the results on inequality revealed that the women in the study population experienced equal coverage gaps regardless of their socioeconomic status.

An even more critical situation emerged in the case of clinical breast examinations. According to data from 2012, only 36.8% of Mexican women in need of intervention had been examined in the last 2 years. A significant gap was detected in the coverage of insured vs uninsured women, with only 25% of the latter in need of intervention having been examined. Lastly, according to the concentration index, the majority of women who had not been examined fell within the poorest strata of the population, thus highlighting the inadequate response of the health system to the imperative need for preventing breast cancer. This is all the more critical given that breast cancer along with cervical-uterine cancer, are the leading causes of death among Mexican women.

On the other hand, between 2006 and 2012, an improvement was noted in the coverage of interventions aimed at controlling diabetes and high blood pressure, as well as preventing influenza. The results also indicated that 85.7% of adult diabetics used hypoglycaemic therapies or insulin to control their condition, with uninsured adult diabetics showing a significantly lower prevalence of self-treatment.

As for high blood pressure control, the study found that, on average, 7 out of 10 affected adults self-reported having taken antihypertensive medication. An analysis by insured status revealed that adults suffering hypertension with Social Security were much more likely to take medication than those with *Seguro Popular* or uninsured. The difference between Social Security enrollees and the uninsured came to 20 percentage points, showing that the absence of medical insurance correlated with as many as one out of two adults suffering hypertension not taking needed medication.

With respect to influenza vaccination, results for adults over 60 indicated an improvement in recent years, with coverage reaching 60% of the target population in 2012. Even though the level of vaccination coverage did not seem to be SES related, it was strongly linked to insurance status. The results indicated that uninsured adults were significantly less likely to receive vaccinations than the insured.

Overall, the concentration indices for the last three indicators showed no evidence of inequitable distribution in utilization coverage.

Conclusion

This study provides relevant evidence regarding the performance of the Mexican health system in recent years. Notwithstanding the limitations encountered in coverage metrics, the results clearly revealed a mixed picture, generalizable to the system as a whole.

The outstanding progress detected in health insurance coverage seems the result of numerous policies, ranging from the Basic Service Coverage Extension Programme to the Social Protection System in Health, which have been implemented since the mid-1990s in an effort to extend the benefits of social protection in health to those who are most in need and have been traditionally deprived of social security. Between 2006 and 2012, not only did the level of health insurance coverage rise by 50%, but also, inequalities in access dwindled to the point that, at present, the majority of Mexicans enjoy the same opportunities for access to public health insurance regardless of their socioeconomic status.

However, despite the promising developments of recent years, the study also found that the performance of the Mexican health system remains far from optimal, a point other investigators have also signalled (Mexican Health Foundation Working Group 2013). A number of areas of opportunity warranting careful examination emerged from the study, particularly in view of their relevance to the achievement of genuine universal coverage, as recommended by WHO (2010). The persistence of broad insurance gaps despite the availability of mechanisms for providing coverage could be a starting point for further study, where analyses must seek solutions that go well beyond guaranteeing access.

An important consideration refers to the large proportion of uninsured and partially insured homes, where at least one household member lacks health insurance. As has been documented, the vulnerability of uninsured individuals not only affects their health, but may also entail considerable financial and emotional stress for their families (Institute of Medicine 2002). This situation calls to investigate in depth the impact that this deficit in coverage could have on the welfare of Mexican households.

Policies for ensuring health care for small children may prove insufficient unless other elements affecting family decisions are also taken into account. Thus, in discussions regarding the most desirable form of insurance for this population, the question arises whether the focus should be on the individual—as is currently the

case with *Seguro Popular* and most private insurers—or the family, as conceived under Social Security.

Our analyses of effective access coverage exposed important gaps that have remained unsolved, for example, in the field of maternal and child health. Here, a number of critical interventions need to be provided irrespective of insurance status, as they involve basic necessities, such as skilled attendance at delivery. According to our findings, around 90% of uninsured women received such assistance with costs usually absorbed by the family. Expenditures recently estimated by IMSS (2013) fluctuated between $1 620 USD and $10 290 USD, depending on the complexity of the birth.

Further, on maternal and child health, our results showed that there is still ample room for improvement in both rising the quality of care and removing the inequities afflicting the poorest communities. In this regard, there is a pressing need for interventions concerning maternal mortality—one of the most sensitive indicators of effectiveness in health policy—especially since according to the Observatory of Maternal Mortality (Freyermuth *et al*. 2013), Mexico is far from meeting its commitments to the Millennium Goals in this area. Additionally, the provision of health care in the first years is crucial to growth and development, with effects often persisting throughout a person's life. In fact, some authors contend that investments in child health are the most effective means of reducing long-term inequalities (UNICEF 2011, Evans *et al* 2000, Heckman 2008). The gaps detected in health coverage for underones are thus among the principal challenges faced by the Mexican health system.

Given that chronic-degenerative diseases are becoming increasingly relevant in the burden of disease in Mexico (Lozano *et al*. 2007, Gómez *et al*. 2011), their prevention should constitute a high priority in health policy. Nonetheless, the analyses revealed insufficient coverage for cervical and breast cancer prevention. This only serves to highlight the inadequate response of the Mexican health system to these needs.

Operational heterogeneity among insurance subsystems in Mexico also deserves special attention. Although some coverage indicators suggest a better performance by Social Security as opposed to *Seguro Popular*, our study provided no compelling evidence in this regard. However, it did demonstrate that the levels of effective access coverage are significantly lower among the uninsured.

The Mexican health system confronts numerous and complex hurdles in its endeavour to construct an equitable and efficient universal coverage scheme. Quality care, financial protection and the reduction of inequalities continue to pose formidable challenges, which could be aggravated by an anticipated slump in Social Security enrolment. In the light of the recent labour reform, it is possible to envisage a scenario where a growing number of people lack social security and come to depend on either non-contributive or private insurance.

It has become evident that the achievement of universal health coverage requires reinforcing the health system through a new institutional arrangement capable of allocating resources more equitably and efficiently, removing barriers to social protection mechanisms, and responding adequately to the needs of the population.

Notwithstanding the inherent limitations of this study, our findings confirm that effective access coverage indicators are useful for evaluating the performance of health systems. Nevertheless, it is necessary to continue developing new approaches to measuring performance, mainly regarding the quality measurement, and to develop adequate information health systems. Assessing precisely how effectively a health system is in improving the wellbeing of the population is imperative in guiding public health policy.

Ethical approval

The article used secondary sources of information publicly available, so we do not use information that may violate copyright or the rights of another person.

Supplementary Data

Supplementary data are available at *HEAPOL* online.

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Notes

1 Further details are available under the OECD review of the Mexican healthcare system (OECD 2005).

2 Social security included the affiliation to the Mexican Social Security Institute (IMSS for its initials in Spanish), the Institute of Social Security and Services for State Workers (ISSSTE for its initials in Spanish), *Petróleos Mexicanos* (PEMEX for its initials in Spanish), or the Ministry of Defense (SEDENA for its initials in Spanish).

3 The adjustment for *Oportunidades* programme was only for ENSANUT 2012, given that ENSANUT 2006 does not includes information about the enrolment in *Oportunidades*.

4 The term socioeconomic regions refer to geographical clusters which group Mexican states sharing similar social and economic conditions (National Institute of Statistics, Geography and Data Processing, or INEGI for its initials in Spanish, 2000).

5 The analysis followed an empirical specification of the form $Logit(y_i) = X_i\beta + \alpha_1 SocialSecurity + \alpha_2 SeguroPopular + \mu_i$, where y_i denotes the coverage variable; X_i is a vector of covariates that included: age, gender, average education level of household members, enrolled to *Oportunidades*, rural condition and socioeconomic region. The Wald test was used to compare Social Security with *Seguro Popular* under H_0: $\alpha_1 - \alpha_2 = 0$.

6 Insurance for a New Generation (SMNG for its Spanish initials) is a *Seguro Popular* strategy aimed at children born on or after 1 December 2006, who do not benefit from social security under the Mexican Social Security Institute (IMSS for its initials in Spanish), the Institute of Social Security and Services for State Workers (ISSSTE for its initials in Spanish), *Petróleos Mexicanos* (PEMEX for its initials in Spanish) or the Ministry of Defense (SEDENA for its initials in Spanish).

7 Non-formal workers are individuals who are self-employed, hold a self-employed relationship with a formal enterprise, or are employed without contributing to Social Security.

8 Only considering the health component of the Social Security's benefit package.

9 Official Mexican Standard NOM 036-SSA2-2002 defines as basic vaccination schedule a programme comprising eight vaccine doses for the prevention of ten illnesses, specifically: three doses of Sabin OPV vaccine against poliomyelitis; one dose of

BCG vaccine against serious forms of tuberculosis; three doses of pentavalent vaccine (DPT+HB+Hib) against tetanus, diphtheria, whooping cough, invasive infections by Haemophilus influenza b and hepatitis B, and one dose of triple-viral MMR vaccine against measles, mumps and rubella.

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