

ENCUENTRO

«ERNEST LLUCH»

*Big Data y Real
World Data* en
el análisis de la
utilización, seguridad
y efectividad de
medicamentos,
tecnologías e
intervenciones
sanitarias

RD2012: cambio politica copago farmaceutico



ORIGINAL RESEARCH ARTICLE

Effect of cost sharing on adherence to evidence-based medications in patients with acute coronary syndrome

Beatriz González López-Valcárcel,¹ Julián Libro, ^{2,3,4} Aníbal García-Sempere,^{2,3} Luz María Peña,⁵ Sofía Bauer,² Jaume Puig-Junoy,⁵ Juan Oliva,⁶ Salvador Peiró,² Gabriel Sanfélix-Gimeno^{2,3}

Cost-sharing scheme characteristics before and after the July 2012 reform					
Study groups	Population groups	Before the reform		After the reform	
		Coinsurance (% price)	Monthly ceiling	Coinsurance (% price)	Monthly ceiling
Pensioners group	Pensioners (annual income lower than €18,000)	0	-	10%	€8
	Pensioners (annual income between €18,000 and €100,000)	0	-	10%	€18
	Pensioners (annual income > €100,000)*	0	-	60%	€60
Low income working population (control group)	Working population (annual income lower than €18,000)	40%	No ceiling	40%	No ceiling
Middle-to-high income working population	Working population (annual income between €18,000 and €100,000)	40%	No ceiling	50%	No ceiling
	Working population (annual income > €100,000)	40%	No ceiling	60%	No ceiling

* Pensioners with annual income >100.000 € account for 0,097% of the Spanish population, and in practice this group is barely relevant for analysis.

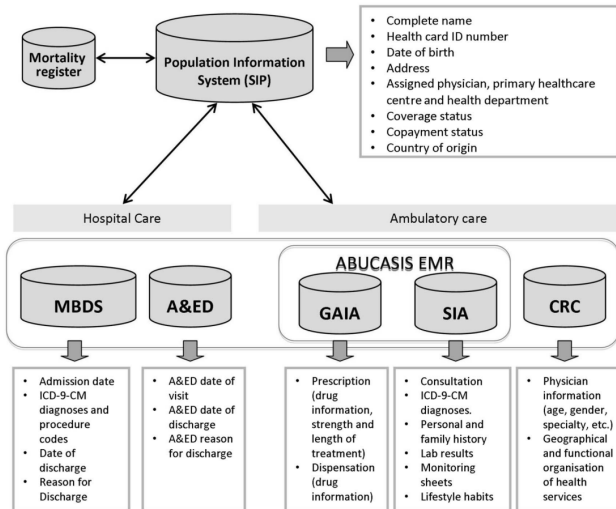


Figure 1 Data sources and linkage between databases. A&ED, accident and emergency department; CRC, Corporate Resource Catalogue; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; MBDS, Minimum Basic Dataset; SIA, Ambulatory Information System.

- Evaluar el impacto diferencial de una intervención de política sanitaria (cambio de copago farmacéutico de 2012) sobre el comportamiento (adherencia a la medicación prescrita) de diferentes agentes afectados de forma diferente por dicha intervención (pensionistas, activos).
1. Cálculo de estimadores de adherencia (PDC) más precisos gracias al enlace de datos de prescripción y dispensación
 2. Construcción de series temporales de tasas semanales de adherencia
 3. Análisis de diferencias entre tendencias antes y después de la intervención (DiD analysis)

- Se analizó el efecto del cambio del sistema de copago sobre los medicamentos que ocurrió en 2012 sobre la adherencia al tratamiento farmacológico de los pacientes con Síndrome Coronario Agudo.
 - En estos pacientes, todas las guías de práctica clínica indican que es necesario que tomen medicación para evitar sufrir eventos graves adicionales (consideramos en el análisis cuatro grupos de medicamentos: antiagregantes, betabloqueantes, IECAs/ARAIIs y estatinas).
- Cohorte poblacional de 10,653 pacientes de la Comunidad Valenciana dados de alta tras sufrir un Síndrome Coronario Agudo en el período 2009 a 2011, y los seguimos hasta diciembre de 2013.
- Experimento natural, con el grupo de activos de menos de 18.000 actuando como grupo control (no cambió el copago) y los pensionistas y activos de más de 18.000 euros de renta anual como grupos de intervención (se modificó su aportación).

- Nuestro análisis consistió en detectar diferencias (en las diferencias) entre grupos en las tendencias de adherencia a la medicación (a los cuatro grupos antes citados) antes y después del cambio del copago.
 - Para ello, utilizamos una metodología innovadora para el cálculo de la adherencia en base a tasas semanales, en que para la determinación de los días con medicación disponible vinculamos los datos de prescripción y dispensación, generando estimadores más precisos de adherencia que los que se obtienen habitualmente en este tipo de estudios.
-

Statistical analysis

We constructed weekly series of adherence rates for the intervention and control cohorts from January 2011 to December 2013, for 18 months before the cost-sharing policy change and 18 months after, totalling 156 weeks. We estimated

difference-in-difference (DiD) models by ordinary least squares through segmented linear regression for the weekly rates of adherence to the four therapeutic groups assessed.¹⁷ The models compared intervention groups (pensioners and the middle-income to high-income working group) with the control group (low-income working population), and detected the occurrence of an immediate effect (level change) and trend effect (slope changes) attributable to the cost-sharing policy

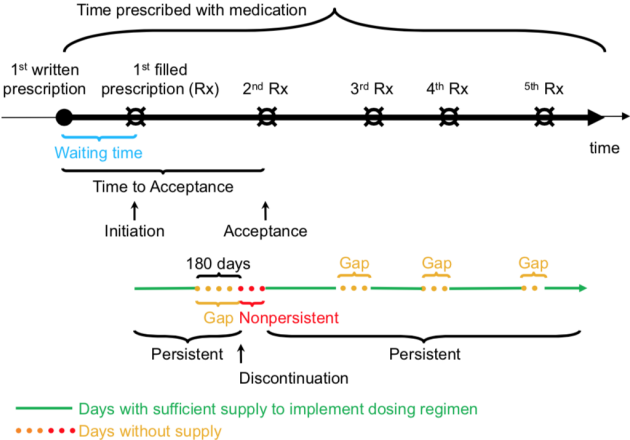
change. The DiD method accounts for unobserved variables that can be different between the groups but are assumed to remain fixed over time, as is the case of age-sex composition of the groups as well as other baseline characteristics. Also, the DiD analysis takes into account and controls for counterfactual temporal trends to provide estimates of differences in trends.

The general model is as follows:

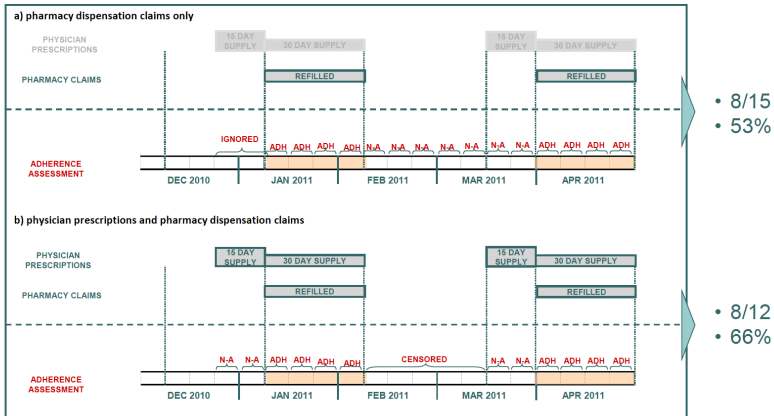
$$Y_t = \alpha_0 + \alpha_1 t + \alpha_2 RD + \alpha_3 .RD + \alpha_4 I + \alpha_5 t .I + \alpha_6 .RD .I + \alpha_7 t .RD .I + \epsilon,$$

where I is the dummy=1 for the intervention group, t is the temporal trend (=1 for the first week of the study time span) and RD is the dummy=1 from July 2012. The model also includes a dummy for August, as preliminary bivariate tests found a significant drop in adherence that month. The DiD estimator for the immediate short-term effect on adherence after the policy change, in the intervention groups, as compared with the control group is α_6 and the estimator for the differential effect on slope change is α_7 . Thus, the total effect of the policy change at week t is $\alpha_6 + \alpha_7 t$. We calculated the model predictions of adherence rates for each group at $t=1, 2, \dots, 18$ months after the change in cost sharing, and compared them with the counterfactual rates (no change scenario) to evaluate medium-term effects. All analyses were done using Stata v13 and R.

serie temporal prescripcion/dispensacion

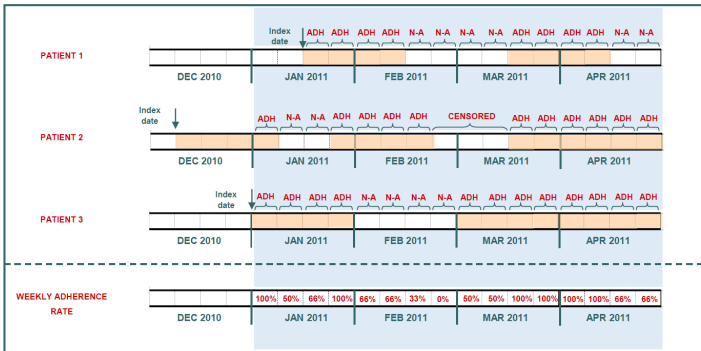


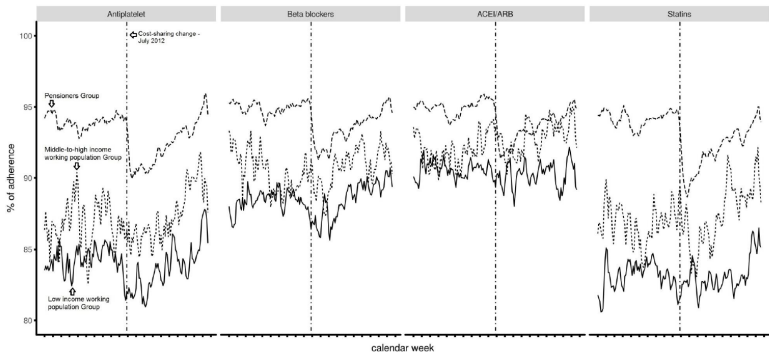
Example of adherence estimation using a) pharmacy dispensation claims only and b) physician prescriptions and pharmacy dispensation claims on calendar time window (weekly adherence is presented as a dichotomous outcome; adherent: PDC \geq 80%).



	DISPENSATION ONLY	PRESCRIPTION & DISPENSATION	DIFERENCIAS
<ul style="list-style-type: none"> Index date (inicio de tratamiento) 	<ul style="list-style-type: none"> Primera dispensación 	<ul style="list-style-type: none"> Primera prescripción 	<ul style="list-style-type: none"> Se es más preciso en la determinación del inicio de tratamiento Se captura la no-adherencia primaria se captura la no-persistencia temprana Se capturan los pacientes con PDC=0
<ul style="list-style-type: none"> Gaps de días cubiertos 	<ul style="list-style-type: none"> Se atribuyen siempre a no-adherencia del paciente 	<ul style="list-style-type: none"> Se atribuyen a no-adherencia del paciente o a interrupción del médico 	<ul style="list-style-type: none"> Se es más preciso en la estimación del PDC – atribución de no-adherencia al paciente Se identifica el patrón de prescripción (importante en iniciadores/new users)

Example of weekly adherence rates assessment (study sample=3 patients).





- Efecto negativo inmediato sobre la adherencia de los **pensionistas** para la medicación de **mayor coste** (estatinas y IECA/ARII).
- La adherencia a **estatinas** también empeoró en el grupo de **activos de renta de más de 18.000 euros**.
- **Sin efectos** claros sobre la adherencia a medicamentos de **bajo precio y bajo nivel de copago** - antiagregantes y betabloqueantes.
- Los efectos podrían ser **temporales**, ya que las tasas de adherencia parecen recuperarse.

Effect of the cost-sharing change on adherence to essential medications

		Antiplatelet	Beta-blockers	ACEI/ARB	Statins
Pensioners Group vs. Control Group	Level change (%)	-1.790 (1.24)	-1.021 (0.97)	-6.792 (6.35)**	-8.293 (5.61)**
	Slope change (%)	0.004 (0.50)	0.000 (0.03)	0.023 (3.84)**	0.031 (3.67)**
	Time to counterfactual adherence rates for pensioners (months)	15.4	17.9	>20.7	18.4
	R ²	0.97	0.96	0.92	0.97
Middle-to-high income Group vs. Control Group	Level change (%)	-1.120 (0.54)	-2.295 (1.41)	0.066 (0.04)	-7.806 (3.57)**
	Slope change (%)	0.010 (0.83)	0.028 (3.03)**	-0.001 (0.17)	0.044 (3.50)**
	Time to counterfactual adherence rates for middle-to-high income population (months)	12.4	12.0	11.7	13.6
	R ²	0.73	0.68	0.64	0.76

N=312

Antiplatelet: Acetyl salicylic Acid; ACEI/ARB: angiotensin converting enzyme inhibitors and Angiotensin II receptor blockers
t-ratios in parentheses * p<0.05; ** p<0.01.



En pacientes de alto riesgo y para medicación esencial, se debería eliminar completamente los copagos, ya que suponen una barrera a la adherencia, y esto pone en serio riesgo a los pacientes de sufrir eventos graves y costosos para el sistema sanitario

Key messages

What is already known on this subject?

Even in the absence of patient cost sharing, adherence to essential medication after an acute coronary syndrome(ACS) is suboptimal. Cost sharing may further affect medication adherence in high-risk patients.

What might this study add?

We obtained more precise adherence estimates through a novel approach. Using this improved outcome measure, we confirmed a detrimental effect of increasing drug patient out-of-pocket expenses on adherence to evidence-based medications in the short term, in a high-risk population-based cohort in a universal healthcare setting.

How might this impact on clinical practice?

Reducing financial barriers to evidence-based medication use could improve health outcomes while reducing total cost of care. Accordingly, consideration should be given to fully exempting high-risk patients, as are patients after an ACS, from drug cost sharing.