

# Addressing Healthcare Inequities in Israel by Eliminating Prescription Drug Copayments

Asher Elhayany, MD, MPA; and Shlomo Vinker, MD

Israel's 1995 National Health Insurance Law mandated that the healthcare system provide equitable high-quality health services to all citizens of Israel. Over the years since the law was enacted,<sup>1</sup> total individual copayments for medical services included in the national health package have increased from 25.6% in 1995 to 33% in 2006.

Healthcare costs worldwide are soaring for many reasons. According to the moral hazard theory, individuals behave differently when they have insurance, using more resources than they would without it.<sup>2,3</sup> Various programs and plans have been initiated in an attempt to contain expenditures.<sup>4,5</sup> One such plan, cost sharing, was implemented as a means of curbing use and expenses.<sup>3</sup> However, this has had unintended consequences, as studies<sup>6-11</sup> have shown that when costs go up patients purchase fewer necessary medications.

Adherence to physician recommendations is often crucial for patients' recovery from an acute illness, and the well-being and longevity of those with a chronic disease depend on an ongoing and often costly regimen of care. Patients who are unable to pay for their healthcare are frequently at greater risk for adverse outcomes.<sup>10,12,13</sup> A study<sup>14</sup> comparing mortality among 22 European countries determined that unequal access to quality healthcare generated inequalities in mortality. In addition, disparities in access to healthcare led to inequalities in survival of patients with chronic conditions.

The effects of copayments on medication use have been well investigated. Among patients with chronic disease, financial limits on drug benefits have been associated with decreased adherence to drug therapy and with poorer control of blood pressure and lipid and glucose levels.<sup>7,10,15</sup> Cost savings from decreasing drug benefits were offset by increases in the costs of hospitalization and emergency department care.<sup>4,16,17</sup> A review article<sup>18</sup> assessed 92 studies on copayments and medication use, and the authors concluded that prescription drug use was inversely related to user charges. In another study,<sup>19</sup> parents reported being unable to afford the cost of antibiotics for their sick children because of high copayments. Older patients and those with lower income and inadequate or no insurance are especially at risk for decreasing their utilization of prescribed medications.<sup>8,12,20,21</sup>

A study<sup>7</sup> of patients prescribed oral antidiabetic medication found that treatment failure was directly related to the copayment

**Objectives:** To determine whether subsidizing prescription drug copayments for patients with chronic illness and low socioeconomic status would increase their use of prescription drugs and improve their health.

**Study Design:** Prospective cohort study.

**Methods:** Enrolled were 355 patients with low socioeconomic status, as defined by the Israel National Insurance Institute, who were not regularly purchasing prescribed medications. Included were patients (mean age, 64.6 years) with diabetes mellitus, hypertension, or hypercholesterolemia, as these chronic illnesses have easily measurable surrogate end points. Patients were followed up for 24 months. Serum glycated hemoglobin level, blood pressure, and low-density lipoprotein cholesterol concentration were measured. Patients paid their copayments using a "credit card" covered by a donation.

**Results:** Two years after initiation of the subsidized copayment program, the mean (SD) values were significantly below those at the outset of the program for blood pressure (136.2 [16.7]/78.0 [8.7] vs 128.2 [13.3]/74.8 [8.1] mm Hg) and low-density lipoprotein cholesterol concentration (116.2 [38.0] vs 105.3 [38.0] mg/dL) ( $P < .001$  for both). The mean glycated hemoglobin level showed no improvement in the first year, but a significant increase was noted by the second year of the program.

**Conclusions:** When copayments for prescription drugs were eliminated, low-income patients demonstrated increased compliance with obtaining medications, better response to treatment, and improved blood pressure and low-density lipoprotein cholesterol concentrations. Glycemic control did not improve.

(*Am J Manag Care.* 2011;17(7):e255-e259)

## In this article

Take-Away Points / e256

Published as a Web exclusive

www.ajmc.com

For author information and disclosures,  
see end of text.

### Take-Away Points

Drug copayments are increasing in all healthcare systems and may deter adequate treatment for low-income patients with chronic diseases.

- Eliminating prescription drug copayments led to improved control of hypertension and hyperlipidemia.
- Eliminating copayments did not change diabetes control, which requires a significant lifestyle change in addition to prescribed medications.
- We call to restore the original intent of the copayment system and advocate for a drug benefit plan in which copayment costs are weighted relative to the direct health value of the medication.

3.9 million members, it is the second largest health maintenance organization in the world. This study was conducted in Clalit Health Services primary care clinics in the cities of Ramle and Lod. These cities have mixed Arab-Jewish populations and are among the poorest in Israel, defined by the Israeli Social Security Agency as having an SES in the lowest 10% of the population. About

amount. Similarly, Roblin et al<sup>11</sup> measured the effects of different levels of cost-sharing increases on oral hypoglycemic use. The most significant decrease in use was found when copayments increased by more than \$10; smaller or no increases did not have the same effect. Goldman et al<sup>22</sup> found that the use of diabetes medications decreased by about 25% when copayments were doubled. Studies<sup>9,23</sup> that found less consistent results included older patients and those with chronic conditions, who may face fewer choices in not taking needed medications.

In 2009, the public sector in Israel contributed about 60% of the nation's healthcare expenses. In parallel, the proportion of private funding has been steadily climbing and is more than one-third of the total national healthcare expenditure.<sup>24</sup> The rising cost of individual healthcare is having an increasingly negative influence on the equitable distribution of health services, which has had the greatest effect on lower-income segments of the population and those with a chronic illness.<sup>25</sup> As it becomes progressively more difficult for individuals to meet the required copayments, their access to medical care diminishes. This is evident in Israel, with 31% choosing to forgo healthcare services because of economic difficulties, and is highest among the Arab sector (42%), Orthodox Jews (41%), the poor (38%), and those with less than 8 years of education (35%).<sup>26</sup>

Overall, increased costs have a negative effect on patient adherence to prescribed drug regimens.<sup>4</sup> In an attempt to reverse these trends, we initiated a process that eliminated the direct cost of copayments for a select group of low-income patients with diabetes mellitus, hypertension, or hyperlipidemia. We initiated this study among patients with low socioeconomic status (SES) in the Israeli health system to determine the effects on adherence and outcome of reducing or eliminating copayments.

## METHODS

### Study Design

Clalit Health Services is the largest health maintenance organization in Israel, insuring 54% of the population. With

20% of these residents receive social welfare assistance compared with 15% nationally. Their mean household income is 25% less than that of the national mean. About 60% of them are of low SES (as defined by the Israel National Insurance Institute) compared with 44% in the general population served by Clalit Health Services.

Patients with low SES who had purchased prescribed medications covering less than 3 months in the previous 12 months were identified from Clalit Health Services records. The study population included adult patients (≥18 years) with diabetes, hypertension, or hyperlipidemia. These chronic illnesses were chosen because they have easily measurable variables of response to medication. Patients who were known abusers of alcohol or drugs were excluded.

Eligible patients were invited to participate in the program by their family physician. Only 25 of 380 patients (6.6%) declined to participate. Those who agreed to participate received a special copayment project "credit card" to purchase prescribed chronic care medications at their regular pharmacy. The card was authorized to pay for predefined classes of drugs for these diseases. The copayment for the chronic illness medications was donated. The copayment amount was debited from a special project bank account.

All patients signed an informed consent to participate in the project. Glycated hemoglobin (A1C) level, blood pressure, and low-density lipoprotein cholesterol (LDL-C) concentration were measured before the intervention and every 6 months thereafter. Patients were followed up for 24 months between December 2006 and December 2008. Data on A1C level and LDL-C concentration were retrieved from the computerized central laboratory repository. Data on blood pressure were obtained from the patients' electronic medical records.

### Statistical Analysis

All statistical analyses were performed using commercially available software (SPSS version 12; SPSS Inc, Chicago, Illinois). We used descriptive statistics and paired *t* test for comparison of values (A1C level, blood pressure, and LDL-C concentration) at baseline and each follow-up visit in an intent-to-treat analysis. *P* < .05 was considered significant.

**Table.** Changes in Health Measures at 6 Months, 1 Year, and 2 Years After Intervention in the Intent-to-Treat Analysis

Health Measure	No. of Patients	Baseline	After 6 mo	P	After 1 y	P	After 2 y	P <sup>a</sup>
<b>Glycated hemoglobin level, mean (SD), %</b>	210 With diabetes mellitus	7.51 (1.50) (n = 187)	7.50 (1.59) (n = 188)	.53	7.62 (1.64) (n = 143)	.15	7.84 (1.68) (n = 162)	<.005 <sup>b</sup>
<b>Blood pressure, mean (SD), mm Hg</b>	260 With hypertension	(n = 250)	(n = 250)		(n = 201)		(n = 248)	
Systolic		136.2 (16.7)	137.5 (17.4)	.19	133.0 (19.3)	.04	128.2 (13.3)	<.001
Diastolic		78.0 (8.7)	78.9 (9.4)	.20	75.3 (10.8)	<.001	74.8 (8.1)	<.001
<b>Low-density lipoprotein cholesterol concentration, mean (SD), mg/dL</b>	323 With hyperlipidemia	116.2 (38.0) (n = 304)	114.5 (39.9) (n = 283)	.22	105.0 (36.5) (n = 201)	<.001	105.3 (38.0) (n = 270)	<.001

SI conversion factor: To convert cholesterol concentration to millimoles per liter, multiply by 0.0259.

<sup>a</sup>Based on paired *t* test comparisons between baseline and each follow-up point.

<sup>b</sup>Follow-up values worse than baseline.

## RESULTS

A total of 355 patients participated in the study. Of these, 195 (54.9%) were female. The mean age of the study population was 64.6 years. Among the study participants, 210 (59.2%) had diabetes, 260 (73.2%) had hypertension, and 323 (91.0%) had hyperlipidemia (Table).

Compliance with obtaining prescribed medications increased during the study, and the mean (SD) monthly copayment expenditure per patient rose from \$13.90 (\$28.70) to \$30.30 (\$51.10) ( $P < .001$ ). In the intent-to-treat analysis, the mean (SD) systolic and diastolic blood pressures decreased significantly within 1 year, from 136.2 (16.7)/78.0 (8.7) mm Hg to 133.0 (19.3)/75.3 (10.8) mm Hg ( $P = .04$  and  $P < .001$ , respectively; Table). During the same period, the mean (SD) LDL-C concentration declined from 116.2 (38.0) to 105.0 (36.5) mg/dL ( $P < .001$ ) (to convert cholesterol concentration to millimoles per liter, multiply by 0.0259).

Two years after initiation of the subsidized copayment program, blood pressures and LDL-C concentrations were still significantly below those at the outset of the program. The mean A1C level showed no improvement in the first year, but a significant increase was noted in the second year of the program.

The copayments for the chronic illness medications were donated. The cost of subsidizing copayments for this study was approximately \$200,000.

## DISCUSSION

We report the results of a program in which patients who were known to avoid filling prescriptions for medications to treat their chronic health conditions because of inability to pay the copayments were able to obtain their medications

discreetly at no cost using a prepaid credit card. Costs were funded by a private donor. It took 1 year after initiating the intervention to achieve significant improvements in blood pressures and LDL-C concentrations. The improvement was stable over 2 years of participation in the program.

Diabetes control was stable in the first year of the intervention and deteriorated over the second year. The initial mean A1C level was high, indicating poor control and probable long-term disease. In this group, lifestyle changes or initiation of insulin therapy are the only options for significant long-term diabetes control.<sup>27</sup> Consistent with our findings, adherence to insulin use and lifestyle changes is more difficult to achieve than adherence to oral medications.<sup>28</sup>

Few studies have reported on the results of a decrease or elimination of copayments. When low-income patients in an inner-city Chicago clinic received assistance in obtaining prescription drugs free of charge, after 6 months diastolic blood pressures, LDL-C concentrations, and hospitalizations decreased, while drug adherence improved.<sup>17</sup>

Although the healthcare system in Israel provides basic coverage to all residents, disparities become evident when individuals are unable to afford copayment fees for office visits, imaging tests, and medications. Israeli households contribute 32.2% to national health expenditures. In 2005, this amount ranked the fifth highest in the world after the United States (54.9%), Mexico (54.5%), Switzerland (40.3%), and Australia (32.5%); it was followed by Canada, whose residents pay 29.7%.<sup>1</sup>

In Israel, quality indicators for community healthcare from 2006 to 2007 showed improvements of 3.9% in A1C level, 2.3% in blood pressure, and 1.9% in LDL-C concentration among insured low-SES individuals older than 65 years.<sup>29</sup>

The study demonstrated increased compliance with obtaining prescribed medications by showing an increase in the

mean monthly expenditure on medications. Improvements of 2.5% to 3.5% in blood pressure and 10.4% in LDL-C concentrations were measured for the patients in our study, implying an association between the 2 variables.

Contrary to expectations of moral hazard theorists, a financial limit on drug benefits has not led to more efficient use of healthcare<sup>30</sup>; rather, it has been associated with lower prescription drug use and with unfavorable clinical outcomes. Fendrick et al,<sup>31</sup> Maciejewski et al,<sup>32</sup> and Kleinke<sup>33</sup> have suggested initiating a value-based rather than price-based system for prescription drug costs, tying the copayment amount to the health value of the drug. One way to implement this would be to have a graduated scale with low or no copayments for essential generic medications, such as those used to treat chronic diseases, and with higher copayments for nonessential life-enhancing drugs.<sup>2</sup>

This study had a few limitations. Patients were selectively chosen by healthcare staff, and there was no randomized control group. Future studies should include a control group to avoid the potential effect of a secular trend or other confounding factors, such as changes in healthcare behaviors, including dietary or exercise habits that may have contributed to the improvement in outcome measures. However, the longitudinal study design allowed us to obtain measurements of participants' A1C level, blood pressure, and LDL-C concentration before and after implementation of the intervention. Although patients continued to be enrolled during the intervention and the data presented herein are cumulative, the results were consistent. Unfortunately, the study sample was too small for us to measure the economic effect on the health plan.

To our knowledge, this is the first study to demonstrate a significant improvement in health measures associated with decreased medication costs among a low-income population in Israel. Eliminating prescription drug copayments for low-income residents with chronic diseases was associated with improved control of hypertension and hyperlipidemia. To reduce inequities in access to care, we advocate for institution of a drug benefit plan as an integral part of the healthcare system in Israel whereby copayment costs are weighted relative to the direct health value of the medication. In addition, a government-supported plan of targeting discounts to the poorer segments of society could be an effective part of a longer-term health promotion and education strategy.

#### Acknowledgment

We thank Faye Schreiber, MS, for editorial assistance.

**Author Affiliations:** Meir Medical Center (AE), Kfar Saba, Israel; and Clalit Health Services (SV), Central District, Rishon Le Zion, Israel.

**Funding Source:** This study was supported by a grant from the Israel Lotus Foundation.

**Author Disclosures:** The authors (AE, SV) report no relationship or fi-

nancial interest with any entity that would pose a conflict of interest with the subject matter of this article.

**Authorship Information:** Concept and design (AE); acquisition of data (SV); analysis and interpretation of data (AE, SV); drafting of the manuscript (AE, SV); critical revision of the manuscript for important intellectual content (AE, SV); statistical analysis (SV); provision of study materials or patients (AE); obtaining funding (AE); and administrative, technical, or logistic support (AE).

**Address correspondence to:** Asher Elhayany, MD, MPA, Meir Medical Center, 59 Tschernichovsky St, Kfar Saba, Israel 44281. E-mail: elasher@clalit.org.il.

## REFERENCES

- Kaidar N, Bin Nun G. *International Comparison of Health Care Systems: Israel and OECD Member States 1970-2005*. Jerusalem: Dept of Health Economics, Ministry of Health, State of Israel; 2007:45.
- Braithwaith RS, Rosen AB. Linking cost sharing to value: an unrivaled yet unrealized public health opportunity. *Ann Intern Med*. 2007;146(8):602-605.
- Nyman JA. Is 'moral hazard' inefficient? the policy implications of a new theory. *Health Aff (Millwood)*. 2004;23(5):194-199.
- Hsu J, Price M, Huang J, et al. Unintended consequences of caps on Medicare drug benefits. *N Engl J Med*. 2006;354(22):2349-2359.
- Tamblyn R, Laprise R, Hanley JA, et al. Adverse events associated with prescription drug cost-sharing among poor and elderly persons. *JAMA*. 2001;285(4):421-429.
- Bae SJ, Paltiel AD, Fuhlbrigge AL, Weiss, ST, Kuntz KM. Modeling the potential impact of a prescription drug copayment increase on the adult asthmatic Medicaid population. *Value Health*. 2008;11(1):110-118.
- Baron J, Wahl P, Fisher M, Plauschinat C. Effect of prescription copayments on adherence and treatment failure with oral antidiabetic medications. *PT*. 2008;33(9):532-553.
- Federman AD, Adams AS, Ross-Degnan D, Soumerai SB, Ayanian JZ. Supplemental insurance and use of effective cardiovascular drugs among elderly Medicare beneficiaries with coronary heart disease. *JAMA*. 2001;286(14):1732-1739.
- Johnson RE, Goodman MJ, Hornbrook MC, Eldredge MB. The impact of increasing patient prescription drug cost sharing on therapeutic classes of drugs received and on the health status of elderly HMO members. *Health Serv Res*. 1997;32(1):103-122.
- Kass-Bartelmes BL, Bosco L. *Prescription Drug Therapies: Reducing Costs and Improving Outcomes*. Rockville, MD: Agency for Healthcare Research and Quality; 2008. Research in Action, issue 8. AHRQ publication 02-0045.
- Roblin DW, Platt R, Goodman MJ, et al. Effect of increased cost-sharing on oral hypoglycemic use in five managed care organizations: how much is too much? *Med Care*. 2005;43(10):951-959.
- Kephart G, Skedgel C, Sketris I, Grootendorst P, Hoar J. Effect of copayments on drug use in the presence of annual payment limits. *Am J Manag Care*. 2007;13(6, pt 2):328-334.
- Trivedi AN, Moloo H, Mor V. Increased ambulatory care copayments and hospitalizations among the elderly. *N Engl J Med*. 2010;362(4):320-328.
- Mackenbach JP, Stirbu I, Roskam AJ, et al; European Union Working Group on Socioeconomic Inequalities in Health. Socioeconomic inequalities in health in 22 European countries [published correction appears in *N Engl J Med*. 2008;359(12):e14]. *N Engl J Med*. 2008;358(23):2468-2481.
- Bentur N, Gross R, Brammli-Greenberg S. Satisfaction with and access to community care of the chronically ill in Israel's health system. *Health Policy*. 2004;67(2):129-136.
- Goldman DP, Joyce GF, Zheng Y. Prescription drug cost sharing: associations with medication and medical utilization and spending and health. *JAMA*. 2007;298(1):61-69.
- Schoen MD, DiDomenico RJ, Connor SE, Dischler JE, Bauman JL. Impact of the cost of prescription drugs on clinical outcomes in indigent patients with heart disease. *Pharmacotherapy*. 2001;21(12):1455-1463.
- Gemmill MC, Thomson S, Mossialos E. What impact do prescription drug charges have on efficiency and equity? evidence from high-income countries. *Int J Equity Health*. 2008;7:e12. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2412871/?tool=pubmed>. Accessed June 11, 2011.

## Eliminating Drug Copayments

19. **Reuveni H, Sheizaf B, Elhayany A, et al.** The effect of drug co-payment policy on the purchase of prescription drugs for children with infections in the community. *Health Policy*. 2002;62(1):1-13.
20. **Briesacher BA, Gurwitz JH, Soumerai SB.** Patients at-risk for cost-related medication nonadherence: a review of the literature. *J Gen Intern Med*. 2007;22(6):864-871.
21. **Lurk JT, DeJong DJ, Woods TM, Knell ME, Carroll CA.** Effects of changes in patient cost sharing and drug sample policies on prescription drug costs and utilization in a safety-net-provider setting. *Am J Health Syst Pharm*. 2004;61(3):267-272.
22. **Goldman DP, Joyce GF, Escarce JJ, et al.** Pharmacy benefits and the use of drugs by the chronically ill. *JAMA*. 2004;291(19):2344-2350.
23. **Pilote L, Beck C, Richard H, Eisenberg MJ.** The effects of cost-sharing on essential drug prescriptions, utilization of medical care and outcomes after acute myocardial infarction in elderly patients. *CMAJ*. 2002;167(3):246-252.
24. **Rosen B, Merkur S.** Israel: health system review. *Health Care Systems Transition*. 2009;11(2):1-226.
25. **Gross R, Brammli-Greenberg S, Waitzberg R.** *Public Opinion of the Level of Service and Performance of the Health-Care System, 2007*. Jerusalem, Israel: Myers-JDC-Brookdale Institute. Research report RR-541-09.
26. **Degani A, Degani R.** *Health Services Needs in Israel: the Center vs. the Periphery*. Ramat Gan: Israeli Medical Association; April 2008.
27. **Benoit SR, Fleming R, Philis-Tsimikas A, Ji M.** Predictors of glycemic control among patients with type 2 diabetes: a longitudinal study. *BMC Public Health*. 2005;5:e36. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1090595/?tool=pubmed>. Accessed June 11, 2011.
28. **Chiu CJ, Wray LA.** Factors predicting glycemic control in middle-aged and older adults with type 2 diabetes. *Prev Chronic Dis*. 2010;7(1):A08. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2811503/?tool=pubmed>. Accessed June 11, 2011.
29. **Porath A, Rabinowitz G, Raskin Segal A, Weitzman R.** *Quality Indicators for Community Health Care in Israel: 2004-2006 Public Report*. Tel Hashomer: Israel Institute for Policy and Health Services Research Health Council, Ministry of Health; April 2007.
30. **Gladwell M.** The moral-hazard myth: the bad idea behind our failed health-care system. *The New Yorker*. August 29, 2005. [www.newyorker.com/archive/2005/08/29/050829fa\\_fact?currentPage=all#ixzz0dVcua1Ec](http://www.newyorker.com/archive/2005/08/29/050829fa_fact?currentPage=all#ixzz0dVcua1Ec). Accessed October 13, 2009.
31. **Fendrick AM, Smith DG, Chermew ME, Shah SN.** A benefit-based copay for prescription drugs: patient contribution based on total benefits, not drug acquisition cost. *Am J Manag Care*. 2001;7(9):861-867.
32. **Maciejewski ML, Bryson CL, Perkins M, et al.** Increasing copayments and adherence to diabetes, hypertension, and hyperlipidemic medications. *Am J Manag Care*. 2010;16(1):e20-e34. <http://www.ajmc.com/login>. Accessed June 11, 2011.
33. **Kleinke JD.** Access versus excess: value-based cost sharing for prescription drugs. *Health Aff (Millwood)*. 2004;23(1):34-47. ■