

Spending on Medicines in Israel in an International Context

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Abstract

Background: Like most developed countries, in the last decade Israel's healthcare system has been subject to cost-containing measures in the drug sector.

Objectives: To provide comparative information in an international context on the level of outpatient drug expenditures in Israel, both total and those publicly financed, and to analyze how these have changed with time during the last decade.

Methods: Using definitions of the OECD (Organization of Economic Cooperation and Development), internationally comparable data on total expenditure and public expenditure on medicines in Israel are provided. The Israeli estimates are based on data from the Ministry of Health audited reports of financial activities of the health management organizations and from the family expenditure surveys carried out by the Central Bureau of Statistics. Per capita total and public expenditures in Israel are analyzed over time, as are their share of national expenditure on health and of gross domestic product. Israel expenditures are then compared with those for individual member countries of the OECD, as well as a 21 country average, from 1992 to 2002.

Results: Analysis of the Israeli expenditure data shows a considerable reduction in growth of per capita total and public expenditures on medicines since 1997. Growth in the share of total drug expenditure of NEH and of GDP has also been constrained since 1997. In an international context, per capita expenditure on medicines in Israel, particularly what is publicly financed, is one of the lowest. Furthermore, its share of NEH and GDP is also very low compared to other countries. This substantive gap in spending on medicines between Israel and other countries has increased since 1997.

Conclusions: Israel, a medium-income country with a lower than average level of expenditure on health compared to OECD countries, has a particularly low level of expenditure on medicines. Whereas the share of health expenditure of GDP in Israel is similar to the international average, the share of drug expenditure of GDP is well below the average. In addition to structural and longer-term factors contributing to Israel's low per capita spending on medicines, such as the young population and the apparently low level of actual prices paid by most institutional purchasers, recent years are witness to the growing impact of National Health Insurance budgetary pressures on HMOs as well as continual increases in prescription cost sharing by patients. The impact is felt both on the demand side (higher co-payments, administrative and prescribing restrictions) and perhaps more crucially on the supply side (price competition, mainly from generics). Substantial extra public funding for the addition of new drugs to the NHI basket in recent years has had no overall impact on these longer-term spending patterns.

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With the introduction of the National Health Insurance Law in Israel in 1995 and its subsequent implementation and development, this policy trend has intensified further. Moreover, government policy has been directed at reducing the extent of government financing on health and to increasing private out-of-pocket spending on health and on drugs in particular. The drug sector is one of the only sectors in the health system where reform has been carried out and where more reforms are continuously being planned [1], even today [2].

In previous analyses of national drug expenditure in Israel during the 1980s and earlier, it was noted that Israel's level of per capita expenditure was low by international standards in spite of substantial growth in consumption, as measured by expenditure per capita at constant prices [3,4]. The introduction and acceptance of new, more expensive drugs replacing cheaper older alternatives was the main driver of this growth. With the introduction of NHI, analysis of HMOs' expenditures showed that the rate of growth in drug expenditure declined drastically during 1995-1998 [5]. More recently, in 2001 [6] and in 2002 [7], there has been a *reduction* in the level of per capita expenditures at constant prices. The present study analyzes Israel's spending on medicines during the decade 1992-2002 and puts it in an international context.

With the availability of comparable international sets of data on health expenditure (OECD Health Data files), as well as improved data on HMO expenditures and revenues and on household expenditure on health in Israel, a comparison of drug expenditure in Israel and OECD countries was undertaken. Using these local data sources, simple and practical formulae for estimating total and public drug expenditures in Israel are proposed and then used for comparison with OECD countries. The paper concludes with a discussion of how the study findings may be explained and of the health, economic and policy implications of "success" in containing spending on medicines in Israel.

Methods

Data sources

Two main Israeli data sources were used in this study:

- Ministry of Health audited reports of HMOs' financial activities [8]: data on the expenditure on (and revenues from) medicines in the community at end-user prices (includes overheads for distribution costs and taxes).

NEH = national expenditure on health

GDP = gross domestic product

HMO = health maintenance organization

NHI = National Health Insurance

OECD = Organization of Economic Cooperation and Development

In Israel, as in most other countries, the public health service system and particularly the part providing pharmaceutical benefits has been subject to an ever-increasing degree of cost containment.

- Central Bureau of Statistics' family expenditure surveys [9]: data on monthly household expenditure on medicines.

The OECD estimates [10] provide international data at two levels of drug expenditure:

- Total expenditure on drugs: excluding hospitals, by outpatients at end-user prices. This includes both prescription and over-the-counter medicines.
- Public expenditure on drugs: the part of total expenditure, as described above, that is publicly financed. It is the mandatory expenditure on prescriptions that is publicly financed. It excludes expenditures on OTC medicines as well as any expenditures on prescription medicines that are not publicly reimbursed.

The Israeli data sets and the OECD set relate to expenditure in the community on drugs and other medical non-durables (e.g., plasters); the latter items may vary across countries but represent only a small fraction of the total.

Estimates of total and public drug expenditures in Israel

Using the OECD data sets as a model for estimating comparable data sets for Israeli drug expenditures, I have arrived at estimates using the following data sources and methodology:

- *Total drug expenditure in Israel*: In the Israeli context this should include expenditure on prescription medicines in the NHI basket of services, on 'private' prescription for medicines not in the basket, and on OTC medicines. The Ministry of Health's financial reports on the HMOs, however, do not include all the expenditure on private prescription medicines or the expenditure on OTC medicines purchased in private pharmacies. Thus, in order to arrive at a comparable Israeli estimate based on the OECD definition of total expenditure on drugs, the following formula has been adopted:

HMO expenditure on medicines (including overheads) *plus* household expenditure on medicines *minus* HMO revenue from medicines.

This formula was chosen in order to eliminate double reporting of drug expenditures by HMOs and households. These estimates were substantiated by checking against other data sources, for example trade and industry data (which includes hospital drug expenditure but excludes distribution costs and taxes).

- *Public drug expenditure in Israel*: In the Israeli context this is equivalent to the net expenditure by the HMOs on prescription medicines that are in the NHI basket. These data became available for the first time for the year 2001 in the Health Ministry reports of the HMOs' financial activities. In order to arrive at a comparable Israeli estimate based on the OECD definition of public expenditure on drugs, the following formula has been adopted:

HMO expenditure on medicines in basket (including overheads) *minus* HMO revenues from medicines in the basket.

OTC = over-the-counter

This calculation gives estimates of public expenditure which are about 52% of total expenditure estimates. This is the proportion one would expect from our knowledge of the extent of cost sharing for prescription medicines by patients (about 35%) [7] and the extent of OTC purchases (about 12–15% of total outpatient expenditure) from industry sources.

Analysis of the Israeli data and comparison with OECD data has been carried out for total (from 1992) and public (since 2001) expenditures on medicines. These data sets are analyzed at the level of and growth in per capita expenditure, as well as for the share of drug expenditure out of national expenditure on health and out of gross domestic product in the economy [11].

Conversions have been made using annual GDP purchasing power parity exchange rates, in order to take into account differences in product costs across the different countries. Such conversions may underestimate actual drug expenditure outside the United States [12]. Drug PPPs would be more suitable, but they are only available for a few countries and for a few selected years up to 1993. Apart from a 1983 comparison study [13] of drug prices in Israel and six other countries, there are no such data for Israel. Although that study concluded that official (not actual) prices in Israel were then on the high side, this is probably no longer the case. Anecdotal evidence suggests that actual (discounted) drug prices paid by institutional purchasers (HMOs and hospitals) may be relatively low in Israel, particularly for multi-source, patent-expired drugs in recent years.

Analysis of Israel drug expenditures

Estimates of *total* drug expenditures are shown in Table 1 (left-hand side) for the years since 1992 for which original data were available and for which calculations could be made as described above. In addition, data on per capita expenditure in Table 1 are given in local currency (shekels) and in dollar terms (\$PPP per GDP). From 2001, data on *public* per capita expenditure are also included [Table 1, in parentheses].

PPP = purchasing power parity

Table 1. Spending on medicines in Israel, 1992–2002*

Year	Total expenditure (public)	Per capita total expenditure (public)		Total expenditure as share (%) of:	
	(NIS million)	NIS**	\$PPP	NEH	GDP
1992	1,176	230	96.8	9.4	0.68
1997	3,278	562	162.0	10.85	0.88
1998	3,599	603	164.0	10.2	0.83
1999	3,811	622	170.9	10.4	0.86
2000	4,356	693	192.0	11.0	0.90
2001	4,503 (2,311)	677 (347***)	194.2 (100)	10.6	0.92
2002	4,846 (2,545)	738 (388****)	196.7 (103)	10.8	0.95

* In the community by outpatients.

** In nominal terms; the general consumer price index increased by 99.3% from 1992 to 2002.

*** Accounts for 13.3% of overall per capita expenditure by HMOs.

**** Accounts for 13.9% of overall per capita expenditure by HMOs.

NEH = national expenditure on health, GDP = gross domestic product, PPP = purchasing power parity, NIS = (new Israeli) shekels.

Level of drug expenditure and growth trends

From Table 1 it can be seen that growth in *total* per capita expenditure on medicines, which was substantial from 1992 to 1997, has been significantly constrained in the last few years. Compared to 67% growth in dollar terms seen in the period 1992–1997, growth during 1997–2002 was about 21%. Per capita expenditure in 2002 (\$197) grew only marginally since 2000 (\$192). In local currency terms, despite the decline of per capita expenditure in 2001, the rate of growth in per capita expenditure during 1997–2002 was about 4% per annum. Reductions in growth rates in per capita expenditure from 1995 were also noted in previous analyses [5–7], which were based on unadjusted HMO expenditures (and not on the formula used here). Taking a longer-term perspective, growth rates in drug expenditures in Israel appear to be declining with time, such that from the mid-1990s they are at a significantly lower rate than seen in the early 1990s [5], the 1980s and earlier [3,4].

In 2002, *public* drug expenditure was 388 shekels per capita; in dollar terms it was \$103 compared to about \$100 in 2001 [Table 1]. Thus, public financing of prescription medicines in the basket is calculated to represent about 52% of total expenditure on medicines by outpatients.

Share of health expenditure and GDP

In 1992, Israel's *total* expenditure on medicines as a share of national expenditure on health was 9.4% [Table 1]. By 1997 this had increased to 10.85%, the same share that it would account for in 2002; during the interim period it fluctuated within the range 10.2%–11.0%. Such fluctuations may reflect developments in non-drug items of expenditure, such as new national salary agreements (e.g., in 2001) and changes in hospitalization tariffs.

Drug expenditure as a share of GDP also rose – from 0.68% in 1992 to 0.88% in 1997. Since 1998 it has been increasing slowly, reaching a peak 0.95% in 2002 [Table 1]. From these data it is calculated that *public* drug expenditure accounted for 5.6% of national expenditure on health and for 0.5% of GDP in 2002.

International Comparison

Table 2 provides data on per capita drug expenditures in Israel with those for 26 OECD countries; OECD averages are the mean calculated for 21 member countries for which data from 1992 to 2002 were available.

Level of drug expenditure and growth trends

In 2002 Israel had the lowest *total* per capita spending (\$197) of all the OECD countries for which the average was \$362 [Table 2]; only Korea had a similar level of spending. In the past, Ireland had a similar level of expenditure as Israel, but by 2002 this was no longer so. Throughout the last decade, Israel has had one of the lowest, or the lowest, level of expenditure on medicines. Since the early 1990s, a number of countries, which in the 1980s and earlier had a similar low level of expenditure (e.g., Australia, Holland, Spain, UK) [3,4], have a higher level of expenditure than Israel.

Israel had the slowest rate of increase (2.6%) in expenditure from 2000 to 2002, much lower than the OECD average (14.2%). During

1997–2002 Israel's growth rate was also much less than the OECD average (22% vs. 40%). This is in sharp contrast to Israel's rapid growth (67%) during 1992–1997, considerably more than the average growth in OECD countries (29%).

In 2002, Israel's *public* per capita expenditure (\$103) was the lowest of all OECD countries and accounted for 52.4% of total drug expenditure. As shown in Table 2, only the U.S. and Canada have a lower share of public funding, but because of their high levels of overall spending they actually publicly finance more on drugs than Israel does in money terms. The U.S., which is only committed to publicly finance prescription medicines for certain sectors of the population, funded on average \$131 per capita in 2002, compared to only \$103 per capita in Israel despite the latter's mandatory national health insurance and comprehensive public healthcare system. A number of other countries (Australia, Denmark, Finland, Italy, Korea) have a similar share to Israel, but again they all publicly finance considerably more than Israel in money terms. Most European countries publicly finance a significantly greater share of their expenditure on medicines than Israel, with Ireland leading at 84.2%. Although Ireland and Israel have both relatively low levels of total expenditure (\$260 and \$197 respectively in 2002), Ireland publicly finances much more (\$219 vs. \$103).

From earlier analyses of trends in HMO expenditures and revenues [6], we know that public financing of drug expenditure declined during the 1990s as patient cost sharing (ratio of drug revenues to drug expenditures) increased almost every year since 1992. In contrast, according to OECD health data [10], public funding has substantially increased since 1990 in several countries (Australia, Canada, Denmark, Finland, France, Greece, Ireland, Japan and the USA). In some countries – Czech Republic, Iceland and Italy – it has declined, but only in Italy to a level as low as Israel's [Table 2].

Share of health expenditure and GDP

In 2002, only Denmark had a much lower share (9.2%) of national expenditure on health devoted to expenditure on medicines than Israel (10.8%) [Table 2]. Countries with a similar share were Switzerland (10.3%), Netherlands (10.4%), Ireland (11%) and Luxembourg (11.6%). The OECD average is considerably higher (16.2%). Countries with a similar level of per capita health expenditure as Israel (\$1,814 in PPP, 2002), such as Finland, Greece and Spain [11], have a substantially larger share of drug expenditure than Israel's share of NEH [Table 2]. Like Israel, most countries have seen a rise in this share during the last decade [10], which catalyzed many of them to undertake or strengthen drug cost-containment policies [14,15].

International comparisons of the share of national expenditure on health out of GDP show that Israel's share (8.7%, 2002) is similar to the OECD average [11]. In contrast, this study shows that Israel's drug expenditure as a share of GDP (0.95%) is one of the lowest [Table 2]. Only Denmark (0.81%), Ireland (0.80%) and Luxembourg (0.72%) had a lower share. Like Israel [Table 1], most countries have seen a rise in the share of drug expenditure out of GDP during the previous decade [10].

Table 2. Spending per capita on medicines 1992–2002* – international comparison

	Per capita total expenditure (\$PPP)				Total expenditure as share (%) of NEH GDP		Public expenditure Per capita (\$PPP) % of total expenditure	
	2002	2000	1997	1992	2002*		2002*	
Israel	197	192	162	97	10.8	0.95	103	52.4
21 country average**	362	317	258	200	16.2	1.40	216	59.8
Australia	346 ('01)	319	228	144	13.8	1.26	186	53.8
Austria	357	331	242	207 ('95)	16.1	1.24	267	74.9
Belgium	NA	NA	319	252	NA	NA	NA	NA
Canada	487	407	315	243	16.6	1.60	183	37.6
Czech Rep.	253	215	231	119	22.6	1.67	196	77.4
Denmark	237	205	183	131	9.2	0.81	124	52.5
Finland	309	263	234	167	15.9	1.16	164	53.0
France	569	490	389	303	20.8	2.02	381	67.0
Germany	408	359	311	288	14.5	1.58	305	74.8
Greece	278	249	221	165	15.3	1.45	199	71.5
Hungary	298	274 ('01)	179	165	27.6	2.15	186	62.5
Iceland	375 ('01)	361	274	218	14	1.39	232	61.8
Ireland	260	188	147	112	11	0.80	219	84.2
Italy	485	446	363	323	22.4	1.90	253	52.1
Japan	390	366	347	280	18.8	1.47	266	68.3
Korea	209	125	100	93	22.4	1.32	110	52.4
Luxembourg	356	322	270	266 ('91)	11.6	0.72	294	82.5
Netherlands	275	237	213	170	10.4	0.95	NA	NA
New Zealand	NA	NA	195	155	NA	NA	NA	NA
Norway	NA	NA	200	123	NA	NA	NA	NA
Portugal	NA	302 ('98)	290	201	NA	NA	NA	NA
Spain	354	318	268	154 ('90)	21.5	1.64	261	73.6
Sweden	330	312	234	159	13.1	1.21	229	69.3
Switzerland	355	333	290	220	10.3	1.15	238	67.0
UK	NA	NA	238	168	NA	NA	NA	NA
USA	674	540	378	279	12.8	1.87	131	19.5

* For some of the countries the original data refer to 2001.

** Only countries with full data for the years listed are included in this measure; other OECD countries for which 2002 data are available: Mexico (\$120) and Slovak Republic (\$260).

NA = not available.

Public drug expenditure as a share of health expenditure in Israel in 2002 at 5.7% was calculated to be considerably less than the OECD average of 9.7% (derived from Table 2 data). Only the U.S. (2.5%) and Denmark (4.8%) have less than Israel's share. As a share of GDP in 2002, public spending in Israel (0.50%) was calculated to be again substantially less than the OECD average of 0.84%. The only countries with a lower share of GDP were again the U.S. (0.36%) and Denmark (0.43%).

Discussion

The rapid growth in spending on medicines seen in the first half of the 1990s may be explained by the impact of substantial immigration, the overall economic well-being following peace process initiatives, as well as responses by HMOs in anticipation of NHI legislation. The impact of these positive spending factors waned during the second half of the 1990s, to be replaced by negative macroeconomic factors such as economic stagnation from 1996, which developed into a recession from 2000.

A previous analysis of (unadjusted) HMO expenditure data until 1998 [5] suggested that the advent of NHI in 1995 negatively impacted on the substantial growth in drug spending in Israel seen earlier in the pre-NHI era. This latest analysis using somewhat different data shows that the decline in the growth of drug spending has since then gathered pace. In 2002, the latest year for which data are available, both total and public per capita expenditures on medicines in Israel were the lowest among OECD countries. Nevertheless, it should be noted that during 1998–2002, substantial funds (150–225 million shekels per annum, totalling over 900 million shekels and representing an increase of about 4.3% and 8.2% of total and public drug expenditures, respectively) were transferred to the HMOs, so that they could provide their members with a large number (272) of new and often expensive drugs added to the basket for the first time. However, these extra funds are not earmarked by the HMOs for spending on these new drugs or even on general drug expenditure, but are added to their overall budgets. This study indicates that even generous extra funding for new drugs appears to have no impact on long-term spending patterns on drugs by the HMOs. This suggests that a more open and less restrictive approach to adding new drugs to the basket could potentially have minimal impact on overall HMO spending on drugs. On the other hand, when no or little extra funds are made available for expanding the basket, the increased budgetary pressures on the HMOs may possibly lead to an even lower

rate of growth in drug spending.

One likely explanation for these post-NHI trends in drug expenditures is budgetary pressure on the HMOs, the more so since the 1998 budgetary arrangements initiated by the Treasury. There is some evidence from analysis of per capita drug expenditures of each of the HMOs that the decline in the growth rate in the NHI era has been more pronounced in the smaller HMOs than in the largest HMO in Israel – General Health Services (Clalit) [6]. The level of per capita spending (standardized by age) in Clalit is lower than in the other HMOs, presumably due to Clalit's greater purchasing power. The greater decline in growth in drug spending could be a result of the greater negative consequences for these other HMOs of the new financing arrangements according to the NHI Law. In addition, the successful outcome of cost containment of drug expenditure is facilitated in these HMOs by their relatively young and healthy memberships. This is particularly the case for Maccabi and Meuhedet, which in 2002 were the only HMOs to balance their budgets for the first time since NHI was introduced.

Clalit, which has benefited the most from the new NHI financing arrangements, has nevertheless to face demand pressures from a more elderly and medically needy membership and this may translate into a lower degree of response to cost-containment measures. This means that relaxing current restrictive policy to adding new drugs, as mentioned earlier, would have more impact on Clalit's drug expenditures; on the other hand, this would be partially offset by additional co-payment revenues.

Another key factor that has emerged as a result of these budgetary pressures was the desire of the HMOs, with government support, to raise revenues by charging patients more for their prescription medicines. The resulting increased level of household expenditures and of patient cost sharing is part of a longer-term trend that has gathered pace since the introduction of NHI [6]. In 1998, prescription co-payments were significantly increased. In 2002, cost sharing by patients for prescription drugs in the basket was 34.2% (44.1% cost sharing of all drugs purchased by HMOs) [7]. Clalit, with an older and more medically needy membership, applies a co-payment that is most directly linked to quantity of medicine prescribed. Consequently, it has benefited the most in terms of increased revenues. However, this policy has led to a situation in which a significant and growing proportion of patients, particularly those in the weaker socioeconomic groups, are foregoing drug therapy due to its cost. Presumably this has contributed to the slowdown in drug expenditure growth, although to what extent is difficult to quantify.

This study shows that public funding on medicines in Israel is now the lowest in a 21 country OECD comparison, accounting for only 52% of total expenditure. The remainder, privately funded by individuals, is mainly made up of prescription co-payments plus a smaller part derived from purchases of OTC medicines. This prescription/OTC split illustrates a paradox in the private funding of drugs, which may well be peculiar to Israel: a relatively high level of cost sharing by patients for drugs in the "publicly" funded basket coupled with a modest level of private purchases of OTC medicines. This may change with soon-to-be implemented changes in OTC accessibility within pharmacies and the introduction of the general sale of OTC medicines in non-pharmacy outlets.

In a study of Israel's health and drug policy networks, it is argued that the introduction of NHI and its implementation weakened the influence of the network of "pro-spending" groups (industry-providers), which in the pre-NHI era had a more direct influence on decision-making for the addition of new drugs and technologies (Sax P. The decision-making process in priority setting of new technologies in the context of Israel's health system reforms. Draft paper, Centre for Drug Studies, Jerusalem). In the NHI era, greater Treasury and central government involvement with more financial control has come to the fore. One could argue that the politics of expansion of benefits, such as new drugs to the basket, has lost out to the politics of retrenchment [16], as manifested in the reduced levels of public financing of health in general and of drugs in particular.

One longer-term factor that has probably contributed to Israel's relatively low level of spending is the apparently quite low actual discounted prices of prescription medicines as compared to other

countries. This may be a result of the monopsonistic purchasing power of the HMOs, particularly Clalit. There is good anecdotal evidence that average prescription medicine prices may be low in Israel. For example, the average cost of a prescription for a widely prescribed group of drugs, the statins, in Germany is reportedly about 460 shekels [17], compared to a range of maximum prices before discounts in Israel of 32–411 shekels. Added to this purchasing power is also the administrative power of HMOs to influence physician prescribing patterns, due in part to the development of sophisticated information systems in the last decade.

Generic substitution has been the mainstay of HMO drug pricing policies in the NHI era. Although simpler and faster regulatory processes for approval of generic drugs were in place already in the early 1990s, the advent of NHI budgetary pressures appears to have catalyzed the HMOs to implement generic substitution more rigorously in recent years (e.g., Maccabi in 2001). Many key medicines (e.g., simvastatin, lamotrigine and terbinafine), whose generic versions have been available in Israel for some years, have yet to go off patent in other countries. As a result of delayed entry of new drugs in the NHI basket followed by the early availability of cheaper generic versions, the net duration of public funding of some patented products with market exclusivity has been relatively short-lived in Israel (e.g., alendronate for osteoporosis). On the other hand, with the availability of cheaper generic versions, medicine consumption has often shown substantial volume increases. For example, statin consumption in Israel increased significantly with the availability of cheaper generic versions, and is apparently quite high by international standards.

Although medical consumerism may be relatively well developed in Israel's population, another factor contributing to Israel's low level of drug spending is its relatively young population. Ireland and Korea, with drug expenditures close to that of Israel [Table 2], also have young populations. Adjusting national health expenditure for demographic differences between countries closes the gap somewhat between Israel's lower than average per capita health expenditure and those of other countries [11]. Likewise, adjusting drug expenditure would no doubt close the substantial drug expenditure gap between Israel and other countries, at least partially.

Implications

There are a number of health, economic and policy implications of a particularly low level of spending on medicines. Firstly, there may be long-term health consequences arising out of low overall consumption of medicines. There appears to be a measurable health return associated with high pharmaceutical consumption across a sample of developed (i.e., OECD) countries [12], in terms of improved mortality outcomes, especially for those of middle age and older. Secondly, drug therapy is often the most cost-effective intervention in medicine. Driving drug expenditure, and its share within overall health expenditure, to relatively low levels may have a negative impact on the economic "efficiency" of Israel's healthcare system.

The low level of public funding, manifested in the high level of

patient cost sharing for prescription medicines in the basket, has considerable implications for the health of the nation. Surveys of patients [18], of HMO members [19] and of household expenditure on medications [20] have shown that patients are foregoing prescription medicines and that this is particularly the case for vulnerable groups [19,20]. The result is a growing degree of health inequality, which is in clear contradiction with the spirit and purpose of the NHI Law. A nationally representative longitudinal study in the U.S. [21] has shown that patients with serious chronic illnesses suffer adverse health events when they restrict their use of prescription drugs due to cost. Health downturns were seen only after 2–3 years, suggesting that cost barriers may have important short-term effects on older people's health and well-being. For example, the study showed that middle-aged and older people with heart disease who cut back on prescribed drugs due to cost are 50% more likely to suffer heart attacks, strokes or angina than those who do not report such under-use.

Israeli health policy with its emphasis on drug policy reforms in recent years continues to successfully face the challenge of restraining growth in drug expenditures. Price controls, international price comparisons and parallel imports, coupled with generic substitution, therapeutic substitution and other low cost prescribing initiatives by the HMOs are the main cost-containment tools. In light of this success, the challenge now is to find ways to ensure equitable access to drug therapy for the entire population at an affordable cost. This will require reevaluation of current co-payment policy with a view to halting the continual erosion of public financing of expenditure on medicines [5–7]. The problem will be to find replacement funding for HMOs that have become dependent on a substantial level of revenues from prescription medicines in the NHI basket.

A possible over-emphasis on drug policy reforms, combined with a relative flexibility of policy implementation and administration in the drug sector, has facilitated the attainment of cost containment in drug spending in Israel's financially constrained public healthcare system. It may be necessary to counterbalance a "crowding out" of spending on medicines in the basket by other less cost-containable items of expenditure, by means of ensuring that a proportion of public funds transferred to the HMOs are earmarked specifically for them. Earmarking could be defined in terms of actual monies, or alternatively as a target growth in drug spending, or as a target share of drug spending out of overall HMO or national health expenditures. New Zealand has recently set pharmaceutical budget growth targets for the next three years, based on agreements between its pharmaceutical management agency (PHARMAC) and district health boards. The agreement includes regular reviews to ensure that the drug budget continues to reflect national health spending priorities [22]. Other countries (France, Italy) employ (unsuccessfully) target parameters of drug expenditure, but unlike in Israel, they are designed to control *overspending*. Whether further HMO regulation in the form of earmarking as suggested is politically feasible in the Israeli context is open to debate.

Finally, this study illustrates the need for some form of regular monitoring of national and public drug expenditures, as well as of

the quantity of medicines consumed, and the creation of an index of price changes in the institutional market. It also highlights the need, in the name of quality assurance, for additional efforts to be made to collect and publicize information on whether patients who need certain key drugs are indeed receiving them. The continued and improved monitoring of drug consumption and expenditure patterns will allow for the assessment of impact of policy change, for example, the implementation of general sale of OTC medicines outside pharmacies during 2005.

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