

# **How Israel reimburses hospitals based on activity: the procedure-related group (PRG) incremental reform**

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## **Country Background Note: Israel**

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## 1. Description of the new payment scheme

Israel traditionally paid its public<sup>1</sup> hospitals retrospectively on a per diem basis. Recently, like other OECD countries, Israel has moved to activity-based payments. While most countries adopted a diagnosis-related group (DRG) payment system, Israel chose a procedure-related group (PRG) system. It differs from DRG because it classifies patients based on the procedure rather than the diagnosis. Currently, the PRG rates are not adjusted for patients' characteristics or severity of the case.

The shift to PRGs is through an incremental reform: procedures undergo micro-costing and are then priced by a joint Health/Finance ministry commission (hospitals' and health plans' administrators participate as observers and advisors). The Ministry of Health (MoH) sets maximum-price lists for public hospitals that determine the rate hospitals are reimbursed for each case treated. For procedures not in the PRG price-list, (e.g. that do not have a differential rate) the hospital is reimbursed on a per diem basis.

## 2. The context and problems that the reform aims to address

### 2.1 *The Israeli healthcare system*<sup>2</sup>

Since 1995, Israel has had a National Health Insurance (NHI) system that provides a benefits package to all citizens and permanent residents of Israel, which the government updates each year. The benefits package includes a broad list of services such as inpatient and ambulatory care, emergency and preventive care, diagnostic exams, and drugs. Compared to other OECD countries, Israel has had low health spending in the last decade (OECD, 2014a). Nevertheless, health outcomes have improved (OECD, 2012) and public satisfaction with the health plans has remained high (Brammli-Greenberg and Medina-Artom, forthcoming).

Every year the government determines the level of funding for NHI, which is financed predominantly from public sources. NHI funds are collected via payroll and general tax revenues. MoH data show that this funding does not grow at the same pace as population growth and aging, or the health cost index (Arieli et al., 2012; MoH, 2014d). The share of public financing declined to 61% of the total health expenditure (THE) in 2013, far below the OECD average of 72%. Accordingly, the share of private financing increased to 39%, which is one of the highest rates among OECD countries (CBS, 2013).

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<sup>1</sup> In this paper we refer to public hospitals as government-owned and private not-for-profit hospitals.

<sup>2</sup> For further information, see Brammli-Greenberg et al., 2014.

Payment and provision of care are the responsibility of the health plans (HPs). Every permanent resident is free to choose from among four competing, nonprofit HPs. The HPs are required by the NHI Law to provide all their members with the services in the NHI benefits package and to ensure reasonable accessibility and availability. For this purpose, HPs are funded by the MoH mainly through prospective payments according to a risk-adjusted capitation formula that considers the insured's age, sex, and place of residence (periphery/center of the country). Small co-payments are required for outpatient visits, pharmaceuticals, visits to specialists, and certain diagnostic exams (which constituted 6.45% of the HPs' revenue in 2013).

The four HPs are third-party payers that manage the utilization and costs of healthcare services through mechanisms that affect the behavior of both provider and consumer, taking into account three key organizational objectives: cost containment, quality improvement, and equity promotion (Enthoven, 1998). Cost containment is one of the HPs' main organizational objectives. Their efforts to control costs include reviewing the utilization of hospital care and arranging discounted bulk purchasing from hospitals, other care providers and pharmaceutical manufacturers (Brammli-Greenberg and Waitzberg, 2013).

## ***2.2 The hospital market***

The MoH has overall responsibility for the health of the Israeli population and the effective functioning of the health system. In addition to its role as regulator, supervisor, planner, and policymaker, the MoH also owns and operates hospitals. Of the 45 general hospitals<sup>3</sup> in Israel, 18 are publicly owned and account for 57% of Israel's acute-care hospital beds. Another 40% of beds (16 general hospitals) are operated by non-profit organizations. The remaining 11 are for-profit hospitals, which are smaller and operate 3% of the beds. Thus, public hospitals account for approximately 97% of the acute beds and 92% of acute admissions (MoH, 2012b). It is important to note that the two largest HPs own general hospitals: Clalit operates eight general nonprofit hospitals (31% of acute beds) whereas Maccabi operates three for-profit hospitals. One of the most noticeable characteristics of the Israeli hospital market is the low number of beds per population (1.9 acute care beds per 1,000 population) and the resultant overload. The overload is expressed by one of the highest hospital bed occupancy rates and shortest average lengths of stay (ALoS): in 2013 the bed occupancy rate was 98.2% for general inpatients compared to the OECD average of 77%;<sup>4</sup> and the

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<sup>3</sup> Israel adopts the OECD definition for "General Hospitals".

<sup>4</sup> [http://www.oecd-ilibrary.org/sites/health\\_glance-2013-en/04/03/index.html?itemId=/content/chapter/health\\_glance-2013-34-en&mimeType=text/html](http://www.oecd-ilibrary.org/sites/health_glance-2013-en/04/03/index.html?itemId=/content/chapter/health_glance-2013-34-en&mimeType=text/html)

ALoS for acute care is 4.0 days. The ALoS for all causes is 6.5 days in Israel compared to 7.4 on average for OECD countries<sup>5</sup> (CBS, 2014; OECD, 2014a).

In 2011, Israel spent more than NIS 23 billion (about €5 billion) on hospital care, of which 94% was publicly funded. This expenditure constitutes about a quarter of the national expenditure on health (CBS, 2014) and around 41% of the NHI budget (MoH, 2013a).

The HPs reimburse providers for services given to their members that are covered by NHI. Approximately 80% of the hospitals' revenue comes from the HPs' payments for services purchased. The remaining 20% comes from sales of services to other public bodies (e.g., the Ministry of Defense and the National Insurance Institute) and private services such as those not included in the NHI and medical tourism (MoH, 2014a).

### ***2.3 The current hospital reimbursement mechanism***

Since the enactment of the NHI Law in 1995, public hospitals in Israel are reimbursed for inpatient care primarily by per diem fees and some case payments for inpatient services. Ambulatory care in hospitals is paid on an FFS basis (see figure 1). Maximum price-lists for public hospitals are mandated by law and set by the government, through a joint MoH and Ministry of Finance (MoF) pricing committee. In order to constrain hospitals costs, the government sets caps on hospitals' annual revenues from each HP. The cap formula is a function of the previous year's purchases by the HPs in each hospital plus an adjustment for demographic growth and the consumer price index. The cap system is modified every three years. In 2013, innovations in the model set a lower cap (i.e., minimum revenue) in addition to the existing upper cap (MoH, 2014b; Financial Arrangements Law, 2013). Besides the cap default mechanism, due to the dominance of HPs, there are further discount arrangements between hospitals and HPs (16% on average). The final payments are negotiated by each HP vis-a-vis each hospital.

Figure 1 shows that most of the government<sup>6</sup> hospitals' income from inpatient elective care is paid at per diem rates. In 2012, 40% of government hospitals' income came from inpatient care paid by per diem rates,

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<sup>5</sup> [http://www.cbs.gov.il/publications13/rep\\_06/pdf/part05\\_h.pdf](http://www.cbs.gov.il/publications13/rep_06/pdf/part05_h.pdf),

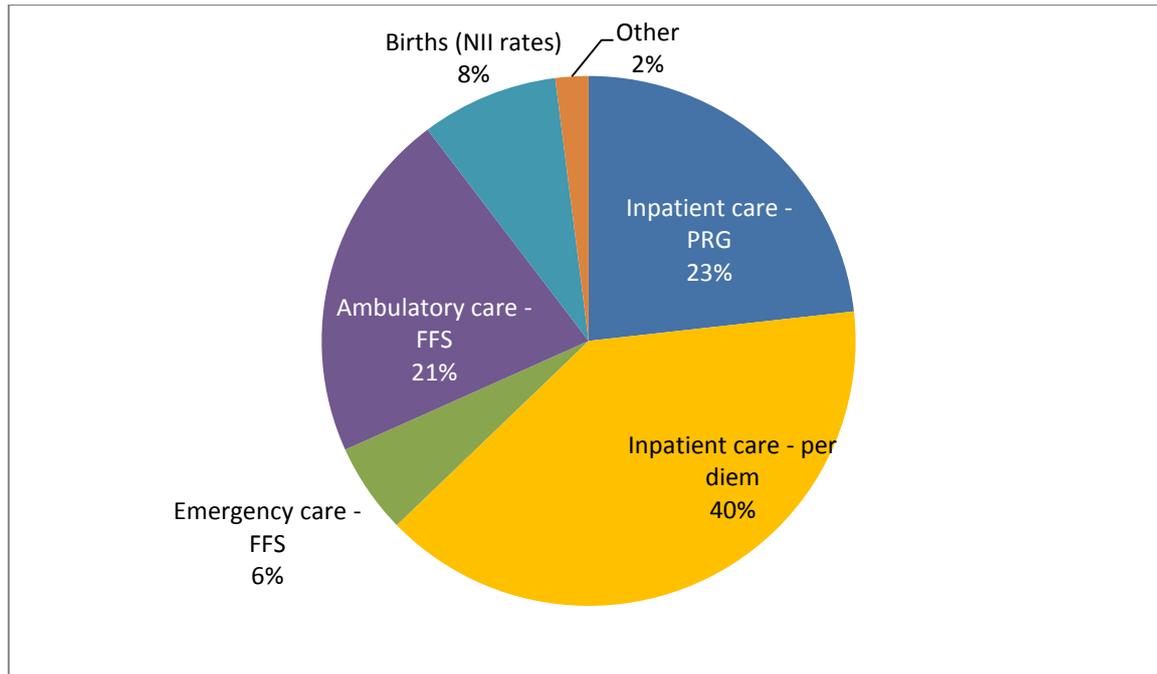
[http://www1.cbs.gov.il/reader/cw\\_usr\\_view\\_SHTML?ID=590](http://www1.cbs.gov.il/reader/cw_usr_view_SHTML?ID=590)

<http://www.oecd.org/els/health-systems/oecd-health-statistics-2014-frequently-requested-data.htm>

<sup>6</sup> Data on private nonprofit and for-profit hospitals are not public domain.

23% from inpatient care paid by PRG, about 20% from FFS for ambulatory care, and 6% from FFS for emergency care. The remaining 10% was for births and other treatments.

**Figure 1. Distribution of Governmental hospitals' gross income by type of service provided and type of reimbursement, 2012**



Source: Ministry of Health (2014a)

### The per diem rates

A third of all hospital activities, which represent two-thirds of the inpatient admissions and half of the interventions performed, are reimbursed on a per diem basis. Since 1985, when the rates were initially set, the per diem rate has been updated by the joint MoH and MoF pricing committee. The annual update is based on public wages index, inflation and technology-price indexes, but the per diem rate has never been re-calculated or reformulated since 1985.<sup>7</sup> In the last decade, differential per diem rates were set for a few wards. Currently, there are about 50 per diem rates. They differ according to the period of hospitalization (i.e., the rate for the first three days in any ward is higher than for the fourth and subsequent days) and the ward (e.g., the rate for one day in a regular neonatal intensive care unit is higher; the rates for one day in a

<sup>7</sup> The per diem rate was set by the MoH based on the 1985 hospitals' national expenditure (not including capital or depreciation) divided by total hospitalization days.

geriatric or internal medicine ward are lower). The rate of one day of hospitalization in ICU is higher for children under 4 than for older patients.

### **Case payments – PRGs (procedure-related groups)**

PRG payments to the Israeli hospital sector were introduced incrementally throughout the 1990s, when 30 types of differential activity-based case payments were established. This shift from per diem payments to PRGs is the reform described in this chapter. As shown below, it is only in the last 5 years that the reform has been accelerated. To date, there are over 280 Israeli PRGs for 7 medical fields (MoH, 2014c). In 2013, PRG represented approximately one quarter of government-owned hospital revenues, which is a third of inpatient revenue, and half of the surgical activities. The defining characteristic of the case-payment method is that it is based on the principal procedure carried out, rather than the diagnosis. The Israeli PRGs are not yet adjusted for patient characteristics (such as, age, gender, co-morbidities).

#### ***2.4 Problems in the hospital market that the PRG reform aims to address***

Deficits in hospitals' and health plans' budgets have been a major issue in the Israeli healthcare system in the last decade. The problems related to the hospital market that the reform attempts to address are described in this section. These problems represent the Israeli healthcare system's major concern nowadays. The MoH has recently attempted to refine the hospital market in many ways. The most important attempt was in 2013, when the MoH appointed a professional inter-ministerial committee to tackle, inter alia, the hospitals' market inefficiencies and inequalities (the Israeli Advisory Committee for Strengthening the Publicly Financed Health System also known by the Health Minister's name, as the German Committee).<sup>8</sup>

##### ***2.4.1. Inadequacy between costs and prices:***

Until 2010, MoH price-lists were not based on a methodical costing process. Per diem rates were set about two decades ago based on the historical expenditures of certain hospitals. Despite annual adjustment, there was no clear costing and pricing method. Therefore, some activities were underpaid and others were overpaid. Under-compensation can lead to selection, deficits and long waiting times. Overcompensation provides incentives to increase activity, which could result in the provision of financially unsustainable or medically inappropriate care (O'Reilly et al., 2012). Since all public hospitals have been facing growing

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<sup>8</sup> For further information on the German Committee and its recommendations see:

<http://brookdale.jdc.org.il/?CategoryID=326&ArticleID=414> and  
<http://www.hspm.org/countries/israel25062012/countrypage.aspx> and  
<https://www.slideshare.net/secret/2PsbyY2loVobqV>

financial deficits, it can be assumed that during the last decade more activities were eventually underpaid (which is intensified by the cap and the additional discounts) than overpaid. In the last decade, the MoH has subsidized almost all governmental hospitals retrospectively. Subsidies have grown significantly from around €68 million in 2006 to €153 million in 2012 (MoH, 2014a). Moreover, as the gap between costs and prices increases, economic considerations are intensified in all medical decisions: (1) Incentives for hospitals to increase activities by either extending ALoS or performing more procedures (moral hazard). (2) Incentives for *cream-skimming* (over provision of lucrative services or services to low severity patients) or *skimming* (under provision of services to high severity patients or unprofitable services) (Ellis, 1998). These market failures were expressed in Israel as follows:

- **Moral Hazard:** Per diem payments create incentives for hospitals to extend stays in hospital. This problem was identified due to wide variations on the ALoS for certain procedures among hospitals. For example, the ALoS in internal medicine wards was found to be longer than in other wards.
- **Selection:** In Israel, two forms of selection were identified: (1) *Cream-skimming*: hospitals preferred treating patients who needed procedures paid by PRG (because it perceived them as better reimbursed). (2) *Skimming*: hospitals preferred to avoid patients needing treatment paid on a per diem basis. In addition, per diem rates do not give hospitals the incentive to perform activities, which leads to underutilization of resources and an increase in ALoS. The two types of selection aggravated the growing waiting times for elective procedures in the public sector, mainly to those procedures underpaid.

An in-depth analysis of this pattern by the MoH led to the conclusion that a consistent costing and pricing mechanism was needed in order to narrow the gap between the cost of services and reimbursement for them.

#### 2.4.2. Negative effects of the private for-profit market over the publicly funded hospital sector

Unbalanced competition between the public and private sector had a negative impact on the public system. For-profit hospitals can, on the one hand, select the low risk or low cost patients and, on the other hand, do not incur the cost of emergency care or teaching and research activities. In addition, for-profit hospitals are not subject to the MoH price-list and charge FFS. These hospitals also have access to the voluntary health insurance funds in the private market. This situation creates negative spill-over effects on the public sector: cream skimming patients by for-profit hospitals leaves the most severe and costly cases to the public hospitals. Consequently, over the last decade, the case-mix treated in public hospitals has become more costly than the average. Since MoH prices are set as national use averages, these costs were not reflected in the price list. Furthermore, the public sector usually receives patients with complications and readmissions from for-profit hospitals. This adds to the economic burden they have to bear (Brammli-Greenberg and Waitzberg, 2014). These negative exogenous effects were intensified with the sharp increase in the for-

profit hospitals' activities in the last decade. For example, between 2005 and 2010, for-profit hospitals' surgical activities grew faster than the public hospitals (22% compared to 14%, respectively). Currently, for-profit hospitals perform about a quarter of all surgical activities, including a share that is funded by the NHI through the HPs (State Comptroller, 2013).

### *2.4.3. Additional challenges*

As mentioned above, besides owning hospitals, the MoH also supervises them and sets policy and priorities. In this capacity, the MoH has identified two additional challenges that it wants to address by refining the reimbursement mechanism:

1. **Difficulties setting policy and priorities:** Reimbursement mechanisms can be used to encourage service providers to promote health policy objectives because they hold incentives that affect the behavior of providers (Brammli-Greenberg, Waitzberg and Glazer, forthcoming; Glazier et al., 2009; Popovian et al., 1999; Van de Ven and Ellis, 2000; Glazer and McGuire, 2000, 2002). The MoH argues that the retrospective per diem method does not enable it to set its priorities for hospital activities such as to improve or increase outputs, prioritize access to advanced technology, or to shorten queues. In their view, "prospective" payments such as PRGs provide stronger incentives for hospitals' activities. For example, they can raise the price of a certain procedure to shorten its waiting times; reduce the price of a certain procedure that is less cost-effective than its alternative to incentivize hospitals to apply a more cost-effective procedure.
2. **Difficulties supervising hospitals' activities and quality of care due to lack of administrative data:** Although the MoH regulates and provides hospital care, it lacks basic information regarding the hospitals' activities. Until 2013, it had no precise data on the number of surgeries performed per year (State Comptroller, 2013). The Ministry started monitoring waiting times for elective surgeries only in mid-2013. Per diem rates did not require hospitals to register or provide the MoH with detailed data about their activities, namely type of procedure, diagnosis, severity of disease and co-morbidities, type of patient, resources allocated and used, etc. This lack of data prevented the monitoring and assessment of hospitals' performance and efficiency. In addition, the lack of information about hospital activities prevented the MoH from building the data set that was needed in order to assemble DRG groups.

To conclude, in light of the aforementioned problems, of which the most severe is the inefficiency created by the gap between costing and pricing of hospitals' activities, the solution the MoH found was a reform in the mechanisms of costing and pricing, along with the payment scheme. In this paper we call it "the PRG reform".

### 3. Understanding the PRG payment reform

While identifying and defining the above problems, the MoH started formulating a reform on hospital costing, pricing, and payment mechanisms. It is a rather "incremental reform," which has been implemented step by step since 2002. At that time, the MoH started a micro-costing mechanism and set differential prices for a few procedures per year. In 2010, a new director general was appointed at the Ministry. He has expertise in hospital management and detected the main problems regarding the hospital sector described above. The director general appointed a new director of pricing at the Ministry's Planning, Budgeting and Pricing unit, and together they announced that pricing hospital procedures and increasing the share of hospital revenues from PRGs would be among the Ministry's major goals.

The objectives of the reform were:

1. To reimburse hospitals more fairly within the public system
2. To reduce inefficiencies caused by the gap between costs and the actual reimbursement hospitals received, namely:
  - a. Moral hazard: reducing unnecessary hospitalization days;
  - b. Adverse selection: reducing incentives to prefer interventions paid per activity rather than per diem, encouraging hospitals to make better use of existing resources, such as performing operations after hours, and thus shorten waiting times.
3. To strengthen public hospitals, mainly while competing with for-profit hospitals.
4. To collect data about hospitals' activities and quality of care in order to improve the MoH's capacity to set policy and priorities, supervise and control.

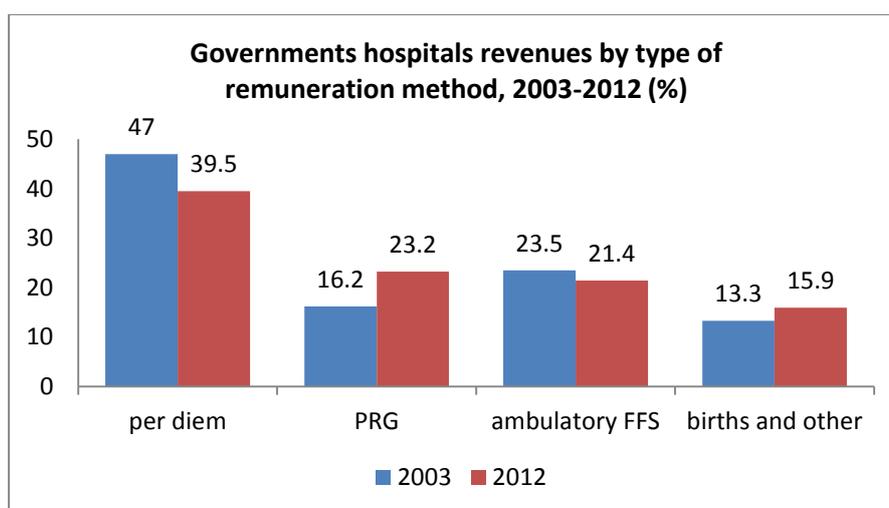
#### *3.1 Incremental reform of the hospital payment system: an attempt to address the problems*

The reform consists of gradually costing hospital activities and setting differential pricing per procedure (PRG). Once the price for a specific procedure has been set, the per diem payment is replaced by the PRG whenever this procedure is performed in a public hospital. The costing and pricing does not rely on the LoS but rather on the clinical need. Therefore, occasionally the shift from per-diem to PRG payments reduced hospital revenues. The new payment scheme yet does not take into account case-mix characteristics (see appendix for a detailed description of the costing and pricing mechanism, and payment scheme).

This process has been an ongoing incremental reform that started in 2002 and has been enhanced since 2010 by the Department of Planning, Budgeting and Pricing at the MoH (see Figure 2). Since 2010, the range of procedures for which payments have been established (as an alternative to per diem reimbursement) has significantly increased and there are now over 280 Israeli PRGs, which account for

about 50% of total procedures. Since 2012, the MoH has defined dozens of PRGs per year. The target is to have about 500 by 2015. The MoH's plans are to keep defining PRGs and increase the amount of procedures paid based on PRG from 50% today to more than 80%, increasing thus the amount of payments made prospectively to hospitals. The following planned steps are to include severity of illness and case-mix to the PRG.

**Figure 2. Incremental transition from per diem to PRG**



Source: Ministry of Health (2014a)

The incremental costing-pricing process is part of a broader policy of strengthening the hospital sector, shortening waiting times for elective procedures, increasing hospitals' activities (mainly in the afternoon), and making better and more efficient use of hospitals' resources.

### ***3.2 Implementing the PRG reform***

#### ***Why PRG?***

When considering solutions to reduce the gap between hospital activities and costs, the MoH chose to shift from per diem to per activity payments. The MoH considered implementing payment mechanisms based on DRGs as is done in most European countries. Yet, as mentioned in section 2.4, there were insufficient data to build accurate DRG groups or implement the method. Despite the fact that nearly half of the acute care beds belong to the MoH, it lacked production and data on quality indicators. Nevertheless, the lack of data did not prevent the MoH from moving to payments based on activity. The MoH solution was to build "in house" PRGs based on its own data collection, instead of relying on hospital reports to build DRGs.

At the same time, the MoH set itself the objective of inducing hospitals to improve their recording and reporting of this type of information in order to increase transparency and enhance its supervision and

control. Reimbursing hospitals by activity forces hospitals to register this type of data. Differential payments based on PRGs were the best financial incentive for hospitals to comply with this requirement.

#### *Why "Incremental"?*

The four main players involved in the hospital market are strong (MoH, MoF, HPs and hospitals). With strong players and no political entity involved in the reform, the MoH chose to implement the reform incrementally, because it was the most feasible strategy. In addition, drastic reforms are perceived by the players as threatening and thus are less acceptable. One of the strongest players in the market is the MoF. It sets the annual government funding level for NHI and is influential in healthcare decisions that have budgetary implications, such as specifying nationwide contracts of physicians' salaries, setting caps on hospital revenues from HPs, and deciding, along with the MoH, the price-lists for healthcare providers (Zwanziger and Brammli-Greenberg, 2011). The four HPs are managed care organizations that are in charge of providing Israeli citizens with NHI services, and are the main purchasers of hospitals services. In addition, the two largest HPs, Clalit and Maccabi, own hospitals and provide ambulatory care. Together, these two HPs cover almost 80% of Israel's citizens. This vertical integration of services provision also endows them with bargaining capacity vis-à-vis the MoH. Hospitals, in turn, are important players because they are to change their functioning and decision-making according to the new economic incentives promoted by the reform. Their cooperation, thus, was crucial for the implementation of the reform.

The different players have different (sometimes, contradictory) interests regarding the reimbursement mechanism.<sup>9</sup> However, both the MoH and the MoF agree that the system should curb inpatient care expenditure and will not entail any change in the allocation of resources (e.g., there will not be any winners or losers from the financial reform). In their view, sharp transitions raise concerns of upsetting the status quo between hospitals and HPs. Bearing in mind each player's considerations, the MoH opted for an incremental reform, which would be smooth enough for the players to adjust to the changes during the implementation process. In addition, while consolidating the reform, the MoH strategically kept all players in the picture – either actively involved (MoF) or informed in advance (hospitals and HPs) – in order to avoid their opposition.

Consequently, the PRG pricing has aimed to be set as a zero-sum game in which there should be no changes in the total hospitals' funds (revenues vs. expenditures). When determining the price of a new PRG

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<sup>9</sup> The HPs did not want changes (increases) in their expenditures, particularly to hospitals. The hospitals did not want a decrease in prices and revenues (also limited by the cap). The NHI Law stipulates that additional budgets must be allocated for every price increase. The MoF aims to maintain the status quo regarding expenditure on hospitals, and to ensure that the HPs and hospitals do not profit or lose from the reform.

or updating a new price of existing PRG, hospitals or HPs as a whole do not earn or lose funds. However, the mechanism might change the budget allocation within each group (i.e., among hospitals and among HPs). This restriction requires two parallel inquiries: costing and quantities used (for further details on the costing and pricing mechanism see the appendix). The "zero-sum" game poses one major barrier for the reform to attain its objectives, as it might force the pricing to be inaccurate or such that provides perverse incentives. Another concern is that the PRG reform subject to "zero-sum" game does not necessarily reduce the gaps between costs and prices for certain procedures.

In conclusion, the MoH has attempted to develop a simple payment scheme that is relatively easy to implement and will be acceptable to all players involved. Although the chosen payment reform was not the only way considered to address the market failures, it was the one that policymakers deemed implementable – practically, politically and strategically.

### ***3.3 Tools to assess the payment reform***

Alongside the payment reform, in the past two years, the MoH has launched three initiatives to improve the hospital market: the first was measurement and monitoring of quality of care indicators; the second was the measurement of waiting times; and the third was a re-evaluation of the costing mechanism. The outputs of these projects can be used by the MoH to assess the immediate effects of the payment reform.

1. Following one of the main OECD recommendations from the 2012 Review of Health Care Quality,<sup>10</sup> in 2013, the MoH launched the "National Program Quality Measures in Hospitals" (QMH), which started measuring quality of care in general hospitals. In 2014, it was extended to include psychiatric and geriatric hospitals. In addition, the program sets quality measures for healthcare for the elderly in any type of hospital. The program is slated for expansion in 2015 to additional areas of medicine, such as mother-and-child preventive care clinics, ambulance services, and psychiatric rehabilitation. While quality measures for community healthcare have been in existence for a decade and have had effective and positive results (OECD, 2012), the QMH has only recently been implemented. The MoH can use quality outputs measurement to monitor whether the increasing PRG scheme affects quality of care in hospitals (for example due to the incentives to shorten ALoS).
2. Measuring waiting times: in 2012, the MoH required all Israeli nonprofit hospitals to collect data on waiting times for 23 elective operations (MoH, 2012b). In 2013, it required hospitals to report on

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<sup>10</sup> "In contrast to primary care, too little is known about the quality of care delivered in hospitals. This lack of information is particularly concerning with Israel's hospitals operating at an occupancy rate of 96% in 2009, well above the average of 76% amongst OECD countries and significantly higher than the 85% level that is broadly considered to be safe occupancy (...)" ( OECD, 2012 p. 12.).

waiting times by source of funding (national health insurance, voluntary insurance or out of pocket) (MoH, 2013b). In 2014, the MoH published data on waiting times for 25 hospitals (governmental and nonprofit) for the first time in the public domain. From now on, the data will be collected and published on a regular basis. This might help the MoH to assess whether PRGs are resulting in shorter waiting times.

3. The MoH started re-evaluating the micro-costing methods for the PRG (Project "building blocks"). The project consists of refining the costing methods and units, recalculating the costs of the basic resource units (such as physician wages and theatre costs), and reviewing the quantities of resources used for each PRG. The objective is to improve the micro-costing methodology in order to get results that are more accurate. There are two main challenges in order to improve the micro-costing building blocks: to assess both the real overhead and the medical staff wages per procedure. As the "building blocks" will be more accurate, the outcomes might reduce the gaps between the current costing and costs for the different hospitals.

Aside from these tools to monitor, no academic policy evaluation has been conducted to date. Shmueli et al. (2002) evaluated part of the effects of the introduction of PRG payment in its initial form during the 1990s. They found that the institution of PRGs resulted in reduced LoS, increased admissions (particularly for those PRGs with the most generous rates), an increase in re-admissions and no recognizable impact on mortality rates. To the best of our knowledge, there have been no additional evaluations since then.

Although the reform was set as a "zero-sum game", the Ministry expects the reform to increase the number of activities performed along with shortening of waiting times of priced procedures. It has been gathering preliminary data showing that during the last decade the proliferation of PRG rates maintained the trend of improving efficiency of hospitals, both in planning and in shortening ALoS on those very departments where LoS were not as short as the general average. Therefore, the MoH intends to evaluate more deeply and systematically the reform, its effects and incentives.

**Indirect outcome:** prior to the implementation of PRGs, there were no reliable data on hospital activities: ICD codes varied among hospitals, and there was no uniform coding and classification system, as it was not important or relevant for the per diem method. Hospitals registered only hospitalization days, but not diagnoses or type of activities. The implementation of PRGs motivated hospitals to keep better track of their activities: it unified classification codes as ICD-9, initiated registration of diagnoses, procedures and patient case-mix. This increased transparency was an "indirect positive outcome" from the reform.

#### 4. Conclusions and discussion

Like most European countries, Israel has been moving from per diem payments to activity-based payments (for public hospitals). The timing of the change was similar to other countries (Geissler et al., 2011). Yet,

unlike most countries, Israel has adopted a payment scheme based on PRGs instead of DRGs. However, in Ireland, Poland and Austria, "information about procedures actually dominates information about diagnoses [in DRGs]" (Kobel et al., 2011 p.49), which means that Israel is not exceptional. Yet the Israeli classification group does not include diagnosis in its classification variables. From OECD countries, only Israel, Korea and Slovakia use procedure services as the basis for hospital reimbursement (OECD, 2014b).

The problems the reform aimed to solve were initially identified about a decade ago, as well as the implementation of costing and pricing mechanisms. Yet from 2002 to 2010, little was done until the incremental reform was promoted by the MoH in 2010. The reform was implemented on a gradual "incremental" way in order not to disturb the balance of resource allocation and overall expenditures of HPs and revenues of hospitals.

Israel chose PRGs instead of DRGs because that was the more feasible system to implement given the lack of data and information needed in a DRG system. The MoH aimed to by-pass the patient classification-grouping phase needed to implement DRGs, and chose a pragmatic payment scheme that depends only on in-house micro-costing, thus avoiding dependency on hospital data. Moreover, PRGs are believed to achieve the same main efficiency objectives as DRGs: increasing activity, shortening unnecessary hospitalization days, reducing the gaps between activity costs and prices, and reimbursing public providers more fairly to balance the competition between public and private hospital sectors.

Additional advantages of PRGs are:

- Relatively simple accounting process;
- Unlike DRGs, they create incentives for hospitals to promote advanced technology and open complex care units;
- When properly priced and adjusted for case mix, the method reduces the adverse selection effect.

The main disadvantages of the method are:

- Not applicable for diagnoses that lack interventional procedures;
- Raises concerns of damaging quality of care due to reduced ALoS; quality of care must therefore be monitored;
- Broad groups of activities or non-accurate pricing can create incentives for hospitals to prefer certain (profitable) medical procedures or avoid other (costly) procedures; and might encourage oversupply of inappropriate services;
- When not adjusted for case mix, can lead to adverse selection;
- Demands constant updates of technological developments.

As in other countries, moving to hospital activity-based payments in Israel required: (1) acceptance of the main players, namely the regulator (MoH and MoF), providers (hospitals) and payers (in the Israeli case, HPs); and (2) the cooperation of the hospitals in collecting and reporting correctly uniform data on their activities. The Israeli MoH opted for involving the main players in the hospital sector in the elaboration and consolidation of the reform on the payment scheme in order to avoid opposition or objections.

This strategy enabled rapid implementation of PRGs, but paid a price of becoming a payment scheme with limited pricing mechanisms. The reform is a "zero-sum game" which will not change the HPs' (as a whole) expenditures on hospitalizations. The reform has not yet been evaluated, yet its implementation can be overseen by constant monitoring of quality of care indicators and waiting times in order to identify and avoid negative impacts. From past studies in Israel, and evidence from other countries, the PRG system seems to shorten ALoS and improve efficiency.

The most important next step for the reform is to refine the Israeli PRG adjustment for patients' characteristics (age, gender, co-morbidities, and severity of illness). The current unadjusted mechanism might lead to selection of low-risk or low-cost patients, and might create cost groups with considerable gaps between costs and payment received, thereby preventing the achievement of its main objectives.

**Lessons for other countries:** the Israeli experience can inspire other countries regarding how to:

1. Implement a controversial reform by involving the main actors in its formulation and consolidation, thus avoiding opposition.
2. Implement activity-based payments with a partial database with few consistent, uniform and transparent data on hospitals' activities, or without a developed patient classification group system, or diagnosis-related groups.
3. Implement an incremental reform on hospitals' reimbursement system, constantly monitored to control for changes in quality of care and waiting times.

To conclude, in countries where evidence of gaps between hospitals' activities costs and the reimbursement received are found, one of the recommendations is to shift to activity-based payments. In the lack of data, platform, or political environment, PRGs are an implementable alternative to DRGs with most advantages of the method. Yet, regardless the type of activity chosen to be paid by (whether diagnosis or procedures), it is important for the payment mechanism to reduce, as much as possible, gaps between costs and prices.

## **Appendix: The PRG costing and pricing mechanism**

The process of assessing costs and setting prices for procedures is performed by the Pricing Division at the MoH together with hospital wards' directors. It occurs in three steps as follows:

### **Step 1: Costing procedure**

1. The MoH selects the most performed procedures that are not yet priced, or procedures for which the ministry wishes to change its incentives or production patterns.
2. The ministry performs micro-costing in cooperation with hospitals: the most experienced surgeons list all inputs and resources used in the procedure including personnel and theatre. The inputs usually represent a normative and prevalent medical approach for an average patient in an average hospital. There is no reference for case-mix.
3. The list of inputs is reviewed and commented by other surgeons.
4. The ministry attaches national average prices to the inputs, including medical devices, personnel wages and costs, permanent and biodegradable resources.
5. The list is again reviewed by experienced surgeons, and by other hospital personnel. The sum of all resource costs is the micro-costing product.
6. This micro-costing is sent to the pricing sub-committee members for discussion, and revisions and comments sent back to the MoH. Members are representatives of all 4 HPs, 4 hospitals, MoF, MoH.
7. The "pricing sub-committee" approves the micro-costing for procedure.

**Step 2: Economic evaluation:** assessment of quantities of procedures performed per year based on data from the Department of Information and Computing at the MoH. The quantities are multiplied by the costing price in order to assess the overall expenditure per procedure per year.

**Step 3: Setting the procedure pricing:** based on the costing and the economic evaluation, and other criteria such as policy objectives (for example shortening waiting times or avoiding oversupply) the MoH sets a maximum price for a certain procedure. This price is later approved by the inter-ministerial pricing committee. The pricing takes into account the procedure's cost and quantity performed per year.

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