

**Ministry of Public Health, Lebanon**  
**Hospital Performance-based Contracting, 2019**  
**Technical document**

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## Performance-based contracting

The purpose of performance-based contracting, a variation of pay-for-performance, is to align the incentives of payers and providers, to focus on intended outcomes. This is meant to address the knowledge asymmetry between the two parties, as well as increase system transparency and encourage provider creativity in achieving outcomes. Performance itself has been differently defined, however in this context it is fundamentally composed of the combination of outcome results, as measured by their respective indicators.

Since 2001 the linkage of hospital reimbursement tier to accreditation results was the Lebanese Ministry of Public Health's (MoPH) response to the payer-provider knowledge asymmetry. Although accreditation has had its documented benefits to the hospitalization system, its presence as the solitary determinant for hospital reimbursement tier was found to be inappropriate and insufficient (Ammar, Khalife et al. 2013). In 2014 the MoPH evolved its contracting system by including several new components which determined reimbursement tier, while retaining accreditation. These new components included the hospital casemix index (CMI), patient satisfaction, Intensive Care Unit (ICU) proportion, surgical to medical case proportion, and hospital deduction rate. Ongoing research documenting the impact of the 2014 intervention has revealed improved coding and increased CMI, particularly among medical hospitalizations.

In this 2019 hospital performance-based contracting intervention, the MoPH has developed its system further, by revising which components included in the performance model, as well as refining the component indicators and algorithms. Casemix index now includes almost 100% of hospitalizations (76% in 2014), the sample size and content of the patient satisfaction survey has been critically revised, and ICU proportion now includes both bed capacity and volume dimensions. New performance components are 30-day readmissions for each of general(all) cases, pneumonia, stroke and cholecystectomy; and elderly proportion (>64y). Based on critical review and discussions with hospitals, the proportion of surgical to medical cases was removed due to its broadness and potential for negative incentives, as was the deduction rate on the basis that hospitals should not bear the consequences twice for inappropriate billing (at payment, and within PBC).

The main purpose of this MoPH policy lever is to improve hospitalization appropriateness, system efficiency, patient satisfaction and fairness in contracting with public and private hospitals. It also creates incentives to further health outcomes and support MoPH healthcare policies.

The datasets used to calculate component results are the latest available calendar year (January to December) unless otherwise stated. The CMI, ICU and elderly proportions datasets use 2017 cases; readmissions use 2016 and 2017 cases (for increased reliability); and patient satisfaction uses survey data collected between November 2017 and October 2018. Facilities previously categorized as mental health/hospice hospitals were excluded, as their cases are non-comparable and the performance framework used here does not apply to them.

## Casemix index

Casemix index is a proxy measure of case complexity, and has been used in various national systems for over three decades, beginning with the US Centers for Medicare and Medicaid Services (CMS). The MoPH's methodological approach and generic formula for calculating CMI in the Lebanese context has been previously documented (Ammar, Khalife et al. 2013, Khalife, Rafeh et al. 2017).

The base of CMI calculation requires developing standardized weights for medical cases (using ICD-10 discharge codes) and for surgical cases (using CPT codes). Due to its flat-fee reimbursement, surgical weights are created using the pre-defined procedural cost. Eleven procedures with weights ten times above the standard reference (1 million LBP) were capped at a weight of 10.00 to limit excessive impact of outliers, especially in low-volume hospitals. The fee-for-service nature of medical cases necessitates the use of average cost per code to define the medical weights. The standard reference was identical to that of surgical cases to allow comparability. The medical weights used for the 2019 intervention are based on 5-year averages, and considerably more reliable than the 2-year averages used in the 2014 intervention; this being possible due to the increased accumulation of hospitalization discharge codes and costs since 2011 when the hospitalization database began including discharge codes. Very rare codes that have had less than 20 cases in 5 years were removed from further calculations, as their cost-weights would be less reliable.

Cases that were excluded from CMI calculation were those of patients being older than 125 years old or having missing data in variables regarding cost, ICD code or hospital name (data entry errors; less than 5 cases). The only code excluded is that of chemotherapy (Z51.1), since including this highly prevalent code (about 10,000 cases) would unfairly result in lower CMI for a few hospitals which have a high proportion of chemotherapy cases (chemotherapy is concentrated in select hospitals).

Casemix index was calculated separately for each of surgical, mixed and medical cases, and among medical cases it was further stratified into short-stays (<2 days), medium-stays (2-15 days) and long-stays (>15 days). Medical all-stay CMI was derived by combining all stay lengths using a case-weighted approach, and this was similarly repeated to combine medical, surgical and mixed cases to obtain a hospital's overall casemix index.

The mean overall casemix index was 1.13 (standard deviation 0.22). The mean medical, surgical and mixed CMIs were 1.16 (0.17), 1.11 (0.37) and 1.11 (0.26). The casemix index component had a 45% weight in the total performance score. In line with recommended composite scoring approaches, results were standardized and capped to remain within two standard deviations above and below the mean. This has been carried out for all other components in order to restrict one component from overly influencing or fully compensating performance on other components. This is a necessary process, otherwise, for example a hospital with an outlier casemix index of 2.50 would always receive a top performance score/reimbursement tier, regardless of results on all other components; or alternatively, an outlier CMI of 0.60 would always remain in the lowest performance score/reimbursement tier regardless of other component results.

## Accreditation

The latest accreditation results were used for this component, primarily from 2014 and with limited results in the following two years. Since the results from the last round are relatively dated, all hospitals that are accredited received 100% of the component score, while those lacking accreditation received

90%. The overall weight of this component within the total performance score was also reduced from the last round (from 40% to 30%).

## Patient satisfaction

The previous patient satisfaction survey used by the MoPH was critically reviewed and updated, as a result of the nine focus group discussions held with MoPH-coverage patients in 2017, piloting and further literature review. Throughout November 2017 to October 2018, a random sample of records was taken from the MoPH hospitalization database, of persons hospitalized and discharged within the past two months. These persons were telephone-contacted by research assistants at the MoPH and asked to participate in the updated MoPH patient satisfaction telephone survey. This resulted in 1,904 responses.

Eight question items were selected and equally weighted to develop a composite score for the patient satisfaction survey: those regarding the admission desk, doctor and nurse interactions, pain relief, dignity and respect, cleanliness, recommendation of hospital to others, and receiving a receipt after payment at the hospital. All hospitals having 10 or more survey responses received their composite scores; those with less than 10 surveys were given the average composite score in order not to have less reliable assessments.

The mean overall patient satisfaction score was 91.7% (standard deviation 4.2%). Among the scored question items, the lowest mean was for receiving a receipt from the hospital (76.9%). The patient satisfaction component had a 20% weight in the total performance score, and results were standardized and capped within two standard deviations of the mean.

## Readmissions

The readmissions component included four conditions: general (any condition), pneumonia, stroke and cholecystectomy. The choice of conditions was made following extensive review of those used in other systems, as well as research on the prevalence, patterns and utility of applying these in the Lebanese context. Thirty-day readmissions were calculated for each of these, with the index case being the specific condition and the readmission being any subsequent condition, except for specified exclusions. This any-subsequent cause approach is widely used in healthcare systems by national authorities and payers in various countries, considering the complexity of the human body and hospitalization causes.

Specific exclusions were made for conditions that likely have a pre-planned hospitalization nature or can be more clearly separated from condition-associated readmissions, and compose a large proportion of all hospitalizations. These were all cases of: cancers and neoplasms (ICD10 C, D), chemotherapy (Z51) pregnancy and childbirth (O), transport accidents (V), dialysis (Z49). In addition, congenital pneumonia (P23) was excluded from pneumonia codes, as were extracorporeal shockwave lithotripsy and cardiac catheterization cases.

The 30-day readmission mean and standard deviations for each of the conditions were as follows: general cases 5.6% (1.7%), pneumonia 5.1% (3.1%), stroke 7.6% (4.2%), and cholecystectomy 3.8% (2.3%). Each of the four conditions were equally weighted, and received 0.5% of the absolute 2.0% readmissions component of the total performance score. For each condition, hospitals within the mean + 0.5 standard

deviations received the full score (0.5%), while those above 0.5 standard deviations received none. The intention of this design is to acknowledge deviation around the mean, but also incentivize the justified reduction of readmissions. Hospitals with less than 20 index cases were given no penalty, due to indicator reliability limitations. No capping was necessary for the readmissions component, due to the categorical structure of the scoring.

## Elderly proportion

This component measured the proportion of persons aged 64 years and older, among all adults (i.e. 18 years and older). Therefore, hospitalization of patients younger than 18 years old has no impact on this component. The age distinction of the younger group was in consideration for the repeated nature and proportion of admissions, particularly in the 0-5 years range, which may be unfair to include for certain hospitals having a high number of such cases.

The intention behind this component's inclusion is two-fold: since our casemix index measure does not include an age-adjustment and including a separate component allows some compensation; the MoPH has a policy of 100% payment coverage for all persons above 64 years old, but requires an incentive to counterbalance any providers that may be cherry-picking and avoiding hospitalization of elderly persons.

The mean elderly proportion was 29.0% (13.3%). Hospital results were standardized and capped within two standard deviations of the mean, and this component had 1% of the total performance score.

## Intensive care unit proportion

In the previous performance-based contracting round (2014) the ICU component considered only the proportion of ICU to total cases. This has been revised to include two sub-components: the proportion of ICU to total cases; and the proportion of ICU to total beds. The indicator for the former is calculated using data extracted from the MoPH hospitalization database, while the latter uses results from a survey conducted by the Syndicate of Private Hospitals as well as direct inquiry with hospitals by the MoPH where necessary.

The rationale for having these two sub-components is that there currently is no consensus in the literature regarding the best approach to incentivize increased ICU capacity, which is the intention behind this component's inclusion (targeting the limited Lebanese ICU capacity). Incentives based solely on volume or on bed numbers present both opportunities for achievement as well as for harm. Therefore, the trade-off was chosen through the inclusion of both sub-components, with some cross-compensation being expected.

The mean ICU proportion of cases was 11.4% (7.6%), and the mean ICU proportion of total beds was 14.1% (13.6%). This component was given 2% of the total performance score (1% per sub-component), and standardization and capping within two standard deviations was undertaken separately.

## Total hospital performance score

The total hospital performance score model included the six components in the table below. The model is a composite score constructed with component weights determined by an analytic hierarchical process conducted within the MoPH, and further refined using an iterative process with pre-defined rules (such as capping) for balancing components.

The total performance score mean and standard deviations were calculated and expressed in z-scores (distance from the mean). This was separately done among public and among private hospitals, as it is more valid to compare within rather than across the different groups. Hospitals with scores above the mean were categorized in the highest reimbursement tier (T1), those with scores below the mean but within -0.75 standard deviations of it were categorized in (T2), with the remaining hospitals categorized in the lowest reimbursement tier (T3).

#	<u>Component</u>	<u>Weight</u>
1	Casemix index	45%
2	Patient satisfaction	20%
3	Accreditation	30%
4	Readmissions	2%
5	Intensive care unit I - cases	1%
	Intensive care unit II - beds	1%
6	Elderly proportion	1%
	<b>Total score</b>	100%

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### References:

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