

Assessing the performance of the chronic care pathway

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SUMMARY

Objectives: value is a key point in a healthcare system, it can be detected through the implementation of performance measurement systems that evaluate the ability of organizations to take decisions and implement actions aim to create and provide value for the population. To reach this goal are needed performance representation tools that help to read health services in an integrated way. The aim of our paper is to describe the implementation into the performance measurement system adopted by 10 Italian regions a new tool that can assess the value creation process across multiple healthcare organizations adopting the patient with chronic disease perspective.

Methods: the article describe the case study of introduction of a new representation tool for the assessment of the chronicity path: the stave.

Results: currently, the chronicity pathway includes 22 indicators grouped in 5 phases: prevention, compliance, efficiency, avoidable hospitalization and outcomes. The phase of compliance, related to primary care, is the one with the highest number of indicators, in line with the National Chronicity Plan. The two staves used as examples here show not only the path through the various phases but also the contribution of each provider (in this case group of general practitioners) to the performance of their geographic area.

Conclusions: the stave shows the performance of the care pathway through the patient's perspective, overcoming providers boundaries and providing a common reading tool to the professionals involved. The stave is, like the performance measurement system, a dynamic system, in continuous revision and integration to meet the needs of the ever-changing healthcare system.

Introduction

In recent decades, public organizations have introduced performance measurement systems aimed at assessing their performance usually with 'silos' approach (1-2). This kind of approach fails to capture the public value which is the result of multiple and interdependently actions of serveral institutions (3-4).

Since 2010, the concept of value has been introduced also in the healthcare context,

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where it was initially defined as the relationship between outcome and resources (5). This definition focuses on the result obtained in terms of health in relation to the resources employed, which is only a part of a broader concept of value for a public health care system. In this case, a population-based approach plays a fundamental role, as suggested by Gray and El Turabi (6).

The identification of value as a key objective of a healthcare system (5-8) requires that performance measurement systems increasingly assess the ability of organizations to make decisions and implement actions that create and deliver value for the target population (9). In fact, value for the population does not correspond to the common way of measuring performance related to the volume of services provided or the outcome achieved and measured in terms of health for patients treated, but is the capacity of the healthcare system to provide the right care to the right person (7). It is not uncommon for healthcare services to be provided to people who do not need them, thus wasting resources, or conversely there are people who are unable to access or receive the most appropriate care for their health conditions. The population perspective allows us to highlight whether healthcare systems are able to deliver value, i.e. deliver services to those who can benefit the most from them.

Performance measurement systems should support this paradigm shift through a new generation of tools capable of integrating different perspectives as well as different dimensions (10-15). In particular, the literature on performance measurement systems in recent years has highlighted some characteristics considered successful in designing tools that support the performances improvement of healthcare organizations:

- Multidimensionality, over the years several frameworks have been proposed to evaluate healthcare services, all of which include multiple dimensions including volumes of activity and financial aspects. Some frameworks group indicators based on the dimensions designed by Donabedian (structure, process and outcome indicators) and others introduce quality of care and equity indicators (12, 16-18).
- Sharing process, the involvement of stakeholders, and in particular of healthcare professionals, is an essential factor to legitimize the measurement tools and their development (e.g. new indicators, revision of existing indicators) that allow to make the evaluation system dynamic in a process of continuous improvement (14, 19).
- Systematic benchmarking of results, comparative evaluation between providers and geographic areas make it possible to overcome the barriers of self-referentiality and to stimulate, through reputational mechanisms, the pursuit of virtuous behaviour and positive emulation (20-21).
- The public disclosure of the results reinforces a responsible use of public resources, also known as public or open accountability (22). Moreover, some studies show that the openness of results combined with systematic benchmarking, makes the

performance evaluation systems even more effective in the use of reputational leverage (21, 23-25).

- Timeliness, the ability to provide results on time increases confidence in the tool used and allows administrators to make decisions based on evidence and up-to-date data (26-28).

However, these factors by themselves are not sufficient if a provider perspective is maintained as different services require inter-organizational relationships (i.e., between the various providers) and thus a system perspective. In particular, for some clinical conditions (e.g. chronic diseases, cancer, mental illness) the value creation process can only be effectively measured by taking the perspective of the value chain that, in healthcare, corresponds to the patient' clinical pathway. Therefore, the adoption of the health-care pathway perspective is fundamental in assessing performance and, consequently, in guiding the decisions of policy makers and other stakeholders (29).

This new approach implies the need to create horizontal inter-organizational networks that foster coordination among health professionals overcoming the organization's walls. Inter-organizational networks, which may or may not be officially recognized, are usually structured to take care of the patient along the different phases of the pathway. The relationships among network components are characterized by interdependence, complexity and continuous change, and the absence of a clear hierarchy that makes their evaluation even more problematic (30).

Traditional performance measurement systems based on a "vertical" perspective (at both the regional healthcare system and the hospital), may lead to the risk of shifting the attention of professionals towards sub-optimal performance at unit level rather than at patients level (31-32). This leads to the "performance paradox" that means improving performance missing the point (27-28, 31-32).

Therefore, it requires to move towards a "horizontal" view that takes into account the patient's journey and needs not just where services are provided (33).

A key element in addressing this challenge is how performance data is presented in a way that encourages it to be read and shared among stakeholders (34). The use of appropriate communication channels, such as an effective visualization system, is one of the key element to creating commitment to achieving desired performance and appropriate behaviours at all organizational levels (34-35), while also stimulating the commitment of all stakeholders to the achievement of the organization's strategic goals (36). Indeed, because people are guided by limited rationality, evidence-based decision making is inherently mediated by the way evidence is communicated. Moreover, according to Bititci et al (34), effective performance data visualization systems support the development and implementation of business strategies, foster performance reviews, as well as support internal and external communication, collabora-

tion and integration between different units and levels, or even cultural changes and innovation.

This paper describes the musical stave of chronic diseases, that is the more recent tool to visualize the performance of care pathways introduced in the Performance Evaluation System of the Network of Italian Regions led by the Management and Health laboratory, aimed at promoting an integrated care between different providers and between different care settings.

Method

The Performance Evaluation System born in 2004 from the collaboration between the Management and Health Laboratory (MeS) of the Institute of Management of the Scuola Superiore Sant'Anna and the Tuscan Regional Healthcare System and then adopted and adapted, starting from 2008, in several Italian regions is known as the "dartboard system" for its synthetic representation of the performance of regions, local health authorities and hospitals. Currently, the Regions that use the performance evaluation system are Basilicata, Calabria, Friuli Venezia Giulia, Liguria, Lombardy, Marche, Tuscany, Apulia, Umbria, Veneto, Piedmont, the Autonomous Province of Bolzano and the Autonomous Province of Trento, which compare the performances of about 190 healthcare organizations. The Regions belonging to the Network share the same evaluation system, which has about 250 indicators, aimed at monitoring and evaluating results belonging to different dimensions, based on the systematic benchmarking of performances. In most of the Regions of the Network, these tools, are integrated with other regional governance mechanisms, such as, for example, the rewarding system or the budget systems (15, 20, 25, 37- 38). The musical stave was introduced in 2016 to promote the vision of the patient's pathway by breaking down the barriers between the different settings of care and the different professionals involved. The musical stave and the dartboard, should be read together because they provide the same assessments of the performance of healthcare services through different perspectives.

The metaphor of the musical stave is intended to convey the message that healthcare systems should play the patient's music, following step by step their movements within the healthcare system.

The indicators selected and shown on the musical stave came from the indicators already used in the dartboard diagram. The selection of indicators is the result of a shared evaluation process with healthcare professionals and managers.

The musical stave is divided by stages in accordance with the path phases of the patient with chronic conditions in the system, as shown in Table 1 (39). The division into phases is represented through the vertical bands that divide the musical stave

itself, metaphorically simulating the beats that make up a musical verse. This graphic representation allows to focus on strengths and weaknesses of each phase, which characterize the provision of healthcare services for patient.

The musical stave, as well as the dartboard diagram, uses 5 evaluation bands associated to five colours representing the related assessment: red is a very poor performance, orange is a poor performance, yellow is an average performance, green is a good performance and dark green is a very good performance.

Currently the staves developed within the performance appraisal system are:

- maternal and child pathway,
- chronicity pathway,
- cancer pathway,
- mental health,
- emergency services,
- home and residential care pathway.

Concerning the dartboard diagram, the musical staves and the indicators can be consulted on the webplatform: <http://performance.santannapisa.it> platform.

This article analyses the chronic care pathway. Chronic conditions affect an increasing number of the Italian population (around 40%) with a similar trend worldwide(40). The visualization offered by the musical stave can represent a tool that opposes the logic of centrality of services and professionals, exalting the multicentricity and the value of patients proposing a unique graph for the pathway. Thus it propose an integrated perspective of the patient pathway, as suggested by the National Plan for Chronic Care (41).

In particular, the paper reports the results achieved by the Tuscany Region on the musical stave of chronic care at the district level. This musical stave can highlight the performance of the primary care providers working in the same catchment area.

Results

The chronic care musical stave, as it is currently structured, groups together a set of indicators relating to various chronic conditions characterised by a high prevalence and a high burden of care with the aim to promote a system perspective centred on the person along the phases of the clinical condition. In this sense, as underlined by the National Plan for Chronic Conditions, the formulation of this pathway has the objective of avoiding the discontinuity among the different levels of care (prevention, primary care, specialist care, hospitalisation, rehabilitation) “giving rise to a continu-

um that includes the identification of specific junctions (clinical and non-clinical) by each care actor or team in relation to the prefixed health objective”. The indicators collected here refer to diabetes, chronic heart failure, stroke, COPD. These indicators are divided into 5 phases described below:

- Prevention, which includes both indicators relating to the promotion of correct lifestyles aimed at the entire population, and more specific indicators of the target population of chronic patients relating to two regional strategies for proactively taking charge of chronic conditions, namely the adapted physical activities and the adherence to the Chronic Care Program;
- Compliance, which includes process indicators of some chronic pathways that consider adherence to the main therapies and follow-up, compliance indicators relating to pharmaceutical assistance and indicators relating to the use of patent-expired molecules for some drug categories;
- Efficiency, which is instead summarized by the indicator on polypharmacy at community level;
- Avoidable hospitalization, which includes hospitalization rates for the main chronic diseases and which are considered potentially avoidable hospitalizations with good territorial care;
- Outcomes, such as the rate of major amputation due to diabetes, is reported as a final outcome indicator which reflects the integration of care along the patient’s path.

Table 1 shows the indicators currently used to evaluate performance in the chronic care musical stage both at the level of the Network and at the level of the Tuscan Evaluation System.

Indicator	Description	Fase
B26.1	% of population > 16 years old assisted by GPs adhering to the modules of the Chronic Care Program	PREVENTION
C21.2.1*	% of patients discharged for AMI who were prescribed ACE inhibitors or Sartans at discharge	COMPLIANCE
C21.2.2*	% of patients discharged for AMI who were concomitantly prescribed antiplatelet and statins at discharge	
C21.2.3*	% of patients discharged for AMI who were concomitantly prescribed antiplatelet and statins at discharge	
C21.3.1*	% of patients in therapy with beta-blocker (90-180 days)	
C21.3.2*	% of patients in therapy with with ACE inhibitors or Sartans (90-180 days)	
C21.3.3*	% of patients adhering to concomitant antiplatelet and statin therapy (90-180 days)	
C9.2*	Dropout rate of patients undergoing therapy with statins (Hypolipidemic)	
C9.6.1.1	Overprescription of statins	
C11A.1.2A	Heart failure residents with at least one creatinine measurement	
C11A.1.2B	Residents with Heart Failure with at least one sodium and potassium measurement	
C11A.1.3	Residents with heart failure in therapy with ACE inhibitors and/or sartans	
C11A.1.4	Residents with heart failure in therapy with beta-blocker	
C11A.2.2	Diabetes residents with at least one measurement of Glycated Hemoglobin	
C11A.2.3	Diabetes residents with at least one eye examination in the last two years	
C11A.5.1	Residents with stroke undergoing antithrombotic therapy	
C9.10.1	Polypharmacy on the territory	EFFICIENCY
C8D.1*	Std hospitalization rate for pathologies sensitive to outpatient treatment per 1,000 residents	AVOIDABLE HOSPITALIZATION
C11A.1.1*	Rate of Hospitalization for Heart Failure per 100,000 Residents (50-74 years)	
C11A.2.1*	Overall Diabetes Hospitalization Rate per 100,000 Residents (35-74 years)	
C11A.3.1*	COPD Hospitalization Rate per 100,000 Residents (50-74 years)	OUTCOME
C11A.2.4*	Rate of major amputations due to diabetes per million residents (three years)	

Table 1. Indicators present in the chronic musical stove

* indicators also present in the Network of Regions Performance Evaluation System

Source: The Performance Evaluation System of the Tuscany Region

The musical staff summarizes the results of the quality of the services provided to patients by the providers working in the same geographical area. Indeed, it highlights the contribution of the different stakeholders to the final result. For this reason, different organizations can appear in the same musical staff and, more in detail, the same indicator can be reported several times with different evaluations for each provider within the organizational level considered (Local Health Authority, District area, Aggregation of General Practitioners). What has just been described can be seen in Figures 1 and 2, examples of musical staff of Aggregation of General Practitioners, for the following indicators: C21.2.1 Percentage of patients discharged for AMI who were concomitantly prescribed ACE inhibitors or Sartans at discharge, C21.2.2 Percentage of patients discharged for AMI who were concomitantly prescribed antiplatelet and statins at discharge, and C21.2.3 Percentage of patients discharged for AMI who were concomitantly prescribed antiplatelets and statins at discharge, which are calculated for all providers in the same geographic area (see Figure 1 and Figure 2).

As it emerges from Figures 1 and 2, examples of musical staff of two Tuscan Districts, the visualization tool presented here allows to capture immediately and clearly the performance evaluation of the services provided for a population of patients with the same health needs, taking into account the different phases of the assistance and the different providers that insist in the same geographic area. In the specific examples reported, each provider corresponds to a specific Aggregation of General Practitioners, thus allowing not only to evaluate the work of each Aggregation of General Practitioners but to compare them in terms of performance and therefore of variability of the service supplied to the population who live in the same geographic area.

Conclusions

The importance to monitor chronic care is progressively growing according with the increasing burden of chronic conditions, both in epidemiological and economic terms. From a performance management perspective it is relevant to develop tools capable to measure the continuity of care and the integration of healthcare services “giving rise to a continuum that includes the identification of specific junctions (clinical and non-clinical) by each care actor or team in relation to the predefined health objective”(41).

The performance evaluation system developed in Tuscany region is an interesting attempt to show information from the patient-centeredness perspective instead of the traditional silos approach. In particular, the musical staff is not intended as a tool for evaluating specific clinical pathway, but as a tool for organisational integration between providers working together in the same geographical area to pursue the health

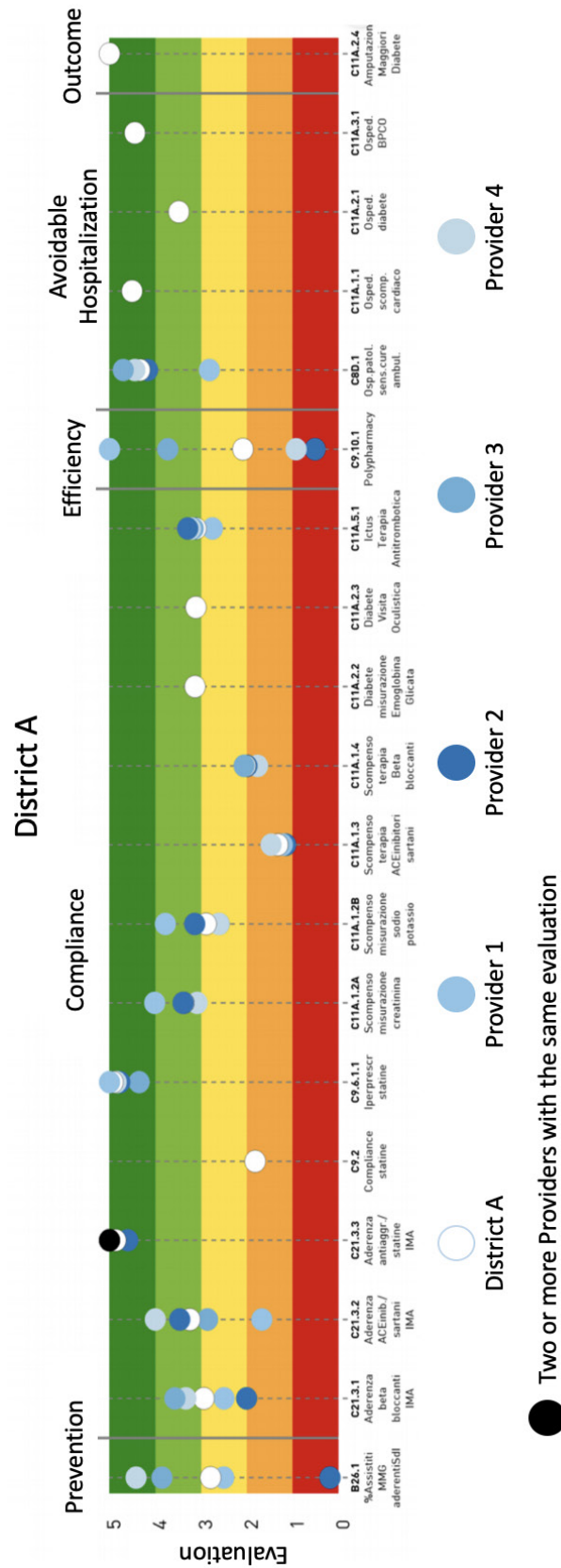


Figure 1. Musical staff District A of Tuscany region

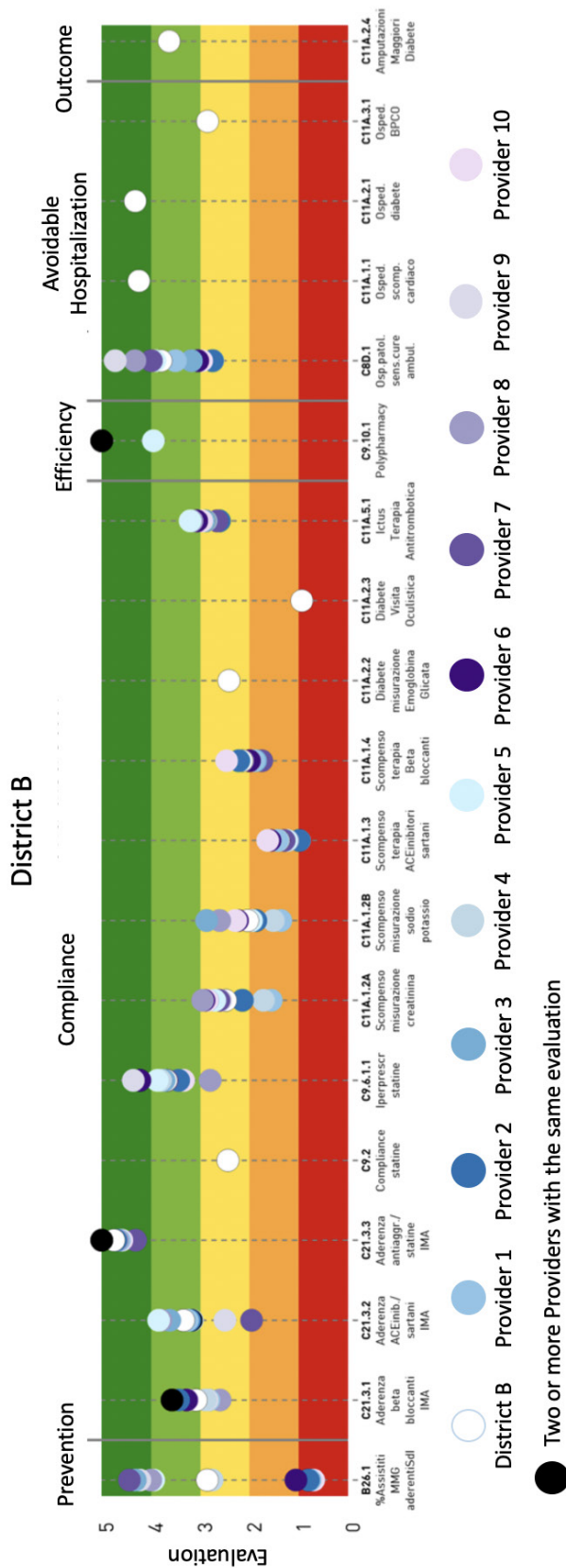


Figure 2. Musical staff of the District B of the Tuscany region

of the population with similar chronic conditions and needs.

One of the main strengths of this experience is the replicability and the transferability of the assessment tool to other contexts, both national and international, thus encouraging comparison and benchmarking between different healthcare systems. Another strength is that the set of indicators currently used can be integrated in the near future with indicators from other sources such as patient-reported experience measures (PREMs) and patient-reported outcomes measures (PROMs). The Management and Health Laboratory is currently studying and testing possible way to integrate the performance coming from administrative flows with the patient's point of view, both in terms of experience and in terms of perceived quality of life, as underlined also by the recent initiative of the OECD through the PaRIS project (Patient Reported Indicator Surveys) aiming at capturing what really counts for the patient (42). This approach, which seeks to promote the point of view of the patient, who is the main actor within healthcare services, is also consistent with the concept of value in healthcare (43). Moreover, this experience suggests how the traditional organizational performance tools aiming at evaluating structures, processes and outcomes through a silos approach, can actually be substituted or accompanied by tools supporting the evaluation of the activities of different providers simultaneously thus promoting inter-organizational evaluation.

A potential limitation that could hinder the implementation of the musical stave and its transferability in other contexts is the unavailability and unreliability of the data. This potential limitation in any case does not invalidate or reduce the innovative approach of the musical stave.

In our opinion, the main challenge that performance measurement systems will have to face in the future is being able to grasp, and therefore measure, the impact that actors belonging to the other systems than the health system, but related to it - such as social assistance -, have on the healthcare system itself, with a view to inter-systemic evaluation. This point, in particular, reflects what has been demonstrated in the literature on the impact that "other dimensions" have on the health of the population. In fact, only 20% of this can be traced back to the quality and services offered by the health system, while 80% can be traced back to other factors such as socio-economic factors (40%), environmental factors (10%) and lifestyles (30%) (44).

Therefore, in order to assess the mutual interactions linking the healthcare system to the surrounding systems (e.g. environmental system) we need to design evaluation systems capable of assessing "collaborative systems", instead of "collaborative organizations". The healthcare systems need to broaden the scope of current measurement systems, by integrating healthcare services with other cross sectoral information.

The musical stave can also reinforce the healthcare professional network through the

provision of information which are, sometimes, hardly to be gathered (45-46). Further development comes from the fact that the performance evaluation system is a dynamic system, which has sought to modify and adapt itself to the needs and the complexity of the healthcare systems. Thus, the musical staff of chronic care will be revised in the near future, thanks also to the close collaboration with health professionals. Among the revisions that are in progress there are, for example, the reorganization and definition of the phases, or the enlargement of the indicators by including both indicators coming from population surveys and indicators relating to the outcomes of care, such as, for example, the 30-day mortality rate for specific pathologies drawn from the National Outcomes Programme.

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