

# Conception of a Balanced Scorecard System to the Traumatology Department of the Hospital Garcia de Orta

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## Abstract

This work aimed at developing the Balanced Scorecard (BSC) methodology, a strategic management and performance evaluation tool, in a public hospital department, namely in the Traumatology Department of Hospital Garcia de Orta. In this theoretic implementation, the department strategy was formulated in objectives and measures, which allowed the identification of the problems that unable the prosecution of the service's mission and the injection of relevant information in the decision process.

After an information collecting phase, revision of the mission, values, vision, and strategy concepts, and meetings with the central actors, the perspectives that would figure in this model were developed: patients/stakeholders, budget, internal processes and learning and growth. Afterwards, the objectives to each perspective were defined, culminating this process in the preparation of the strategic map. In parallel, the measurement system was established, followed by the setting of targets and initiatives. Finally, a scorecard with 20 objectives and 26 measures, distributed by 4 perspectives, was obtained. To make the conceptualization of the BSC more appellative and organized, the obtained data were introduced in the FOR XML software.

The Balanced Scorecard tool proved to be very flexible, being successfully adapted to the Traumatology Department. Its development was very advantageous to the understanding of the strategy, providing, in a quick and attractive way, useful information, and revealing to be extremely important in the service management process. A practical implementation is left as future work.

**Key words:** Management of health public services, performance evaluation, Balanced Scorecard, FOR XML

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## I. INTRODUCTION

What you measure is what you get<sup>1</sup>. This quote, from the paper that first described the concept of Balanced Scorecard (BSC), establishes a breakthrough in the way business world is seen. Up to this point, the financial measures of performance dominated the companies' performance measurement. However, besides the fact that they can provide erroneous signs to the continuous improvement and innovation, its inconsistency with the business world and its lack of predictive power made them insufficient to the people interested in getting the basic goals to the success of the organizations. Although financial measures worked well in the industrial age context, these are now unframed from the competences and capacities that, nowadays, companies try to dominate.

Through this observation, the goal was not to blacken the importance of the financial measures, but to highlight its deficiencies.

Given this need, a powerful measurement system was developed by Kaplan and Norton who conceived a methodology - BSC - which balances the financial measures, referent to activities already done, with the operational measures, inducers of future performance.

Since the conception of BSC in 1992, its dissemination has been a constant. A world study embracing 45 countries, and published in the end of 2007 in the book "*Scorecard Best Practices – Design, Implementation and Evaluation*", states that BSC is the most used methodology as a model of the

performance management – 62% of the companies use this tool.

While BSC was being successfully applied in the private sector, some people believed in the potential of BSC to be applied in the public sector as well. However, this would demand some changes in the framework. Still, these changes do not impede reaching equal success.

In the Portuguese public services, it has become evident the need of methodologies which allow organized and available information, as well as a systematized practice of treatment and anchorage of relevant factual information and of analysis routines. In early 2008, the Instituto Nacional de Administração (INA) announced that it is developing training hours about the Sistema Integrado de Avaliação do Desempenho da Administração Pública (SIADAP), which aims the evaluation of services, top leaders and employees. The BSC has been one of the tools regularly spoken.

In the health sector, performance management acquires a different dimension, due to the specific challenges of the sector. Health management, with its distinctive features, is extremely complex thus being "a unique challenge of management"<sup>2</sup>. Nevertheless, there are plenty of defenders of the application of BSC in this sector<sup>3-6</sup>.

In Portugal, in recent years, the ideal conditions to the application of BSC have been joined. The tendency of hospitals to become enterprises is outstanding, with clear evidences of the usage of mechanisms similar to the ones used in the private sector, namely, the introduction of

business terms like revenues/costs and the contract production with the Serviço Nacional de Saúde (SNS), in the same lines of what has already been done with the health subsystems and with private operators, namely, insurance companies.

At the same time, it was introduced the current practice of benchmarking, the preparation of strategic, action and business plans, and the integration of these elements with systems that follow the performance, spread the knowledge and stimulate good clinical practices. In this way, it shows up the *tableau the bord* system, adopted by the EPE hospitals (Enterprise Public Entity).

The growing applicability of BSC in Portugal, its dissemination into public services and the international successful cases of its implementation in the health sector<sup>5-6</sup>, make one believe that this work is of great interest for this kind of organizations.

## II. PERFORMANCE MANAGEMENT: CONTEXT AND IMPORTANCY

Performance management is a concept rooted, for a long time, in the management of several private organizations. Since the 80's, as a result of the introduction of the New Public Management in many countries, this concept has been having a significant focus in public services. Strongly associated to this concept is the measurement process.

The basic principle of performance measurement, in an organizational perspective, consists of the creation of methodologies based, essentially, in numeric facts, that aid decision making and the development of operations that lead to the alignment of the whole organization to improve the performance. In order to do that, it is necessary to have indicators or metrics, correctly identified and selected, that should integrate the support structure to obtain, treat, analyse and interpret the information. Through the outputs originated from the indicators it is possible to motivate and align the people with the mission, vision and strategic objectives, contributing to the success of the organization.

In the case of public services, the measurement should be particularly centered in the results, and not in the evaluation, to guarantee that the measurement is not seen in a punitive way, but in a motivating one.

After the measurement, the obtained results should be reported to the correct levels of decision. With this report, more transparency and real knowledge of the whole organization is acquired. The management and control of performance could, thus, be seen as an important intermediate step in a logic sequence that initiates with a measurement system, followed by report, and culminating with improvement actions.

In Portugal, public services' performance evaluation is still in an embryonic state, when compared with the strongly developed countries, having found some resistance trough the years. Portugal did not follow the 80's «wave» and it has not taken the chance in the 90's, entering in the XXI century with serious problems<sup>7</sup>.

However, nowadays, there is an obvious wish of change from part of the different political and social intervenients which should be regarded with optimism.

There are several sets of methodologies for performance measurement that give an answer to the organizations needs. When deciding which model is better to reproduce the work intended to be developed, one must analyze the study situation nature, as well as the relation between the inputs and the outputs.

Despite the extensive number of existing methodologies, due to their success, just a few are nowadays largely used. Examples of these methodologies include EFQM (European Foundation for Quality Management) Excellent Mondel<sup>8</sup>, Six Sigma<sup>9</sup>, Balanced Scorecard<sup>1</sup>.

Taking in consideration the advantages described in chapter I, the fact that the support team has a strong know how in the field and also the success cases (non-nationals) in the health sector, in this work, the chosen tool to be tested in a Portuguese health organization was the Balanced Scorecard.

### A. Balanced Scorecard

The Balanced Scorecard concept was developed in the 90's by Robert Kaplan, a professor at Harvard University, and by David Norton, a consultant from Boston, after developing a research study wrapping 12 companies. In this study, they tried to explore new ways to measure performance since a strong disbelief started to be felt in the financial measures by the modern companies. Regarding the financial measures, they were criticized for their inconsistency with the current business reality, for the long term thinking sacrifice and for not being relevant to several organization levels.

The target companies of the study, as well as Kaplan and Norton, believed that the trust put in financial measures were corrupting conclusions, thus affecting the companies capability of creating value. In this way, in the alternatives set, the more viable one and that would thrive was the idea of a Scorecard with performance measures that reflect the business activities as a whole – internal business processes, structural and functional activities, clients' interests and, logically, shareholders' interests. Although BSC initially appeared to just correct the incompleteness of the methodologies, it quickly evolved to a powerful management and change support tool for any organization. In 1992, Kaplan and Norton summarize this new tool in a series of three articles in the *Harvard Business Review*, "The Balanced Scorecard – Measures that Drive Performance"<sup>1</sup>.

In the following years, several organizations adopted this tool, not only to complement the financial measures, but also to communicate the strategy through the selected measures. In most of these cases results were immediate. The implementation of this model is still ongoing, has been adopted by half of the companies that integrate the Fortune 1000<sup>10</sup>.

The Balanced Scorecard can be described as a set of specifically selected measures which are supported in perspectives – financial, customer, internal business and innovation and learning - and that originate from the global vision of the companies' strategy reflecting their intangible and tangible value. The measures selected by the process allow the communication of results to employees and other interested people, serving also as a motor of motivation, allowing as well to reach the mission and the objectives for which an enterprise intends to. Thus, it can be said that this

tool carries out three finalities: it is an efficient measurement tool, a strategic management system and a communication way.

It is pointed out, nevertheless, that the perspectives do not have to be followed categorically. Perspectives can be added or modified, according to what it will suit for the organization.

It is by these perspectives, totally connected, that the objectives will be fixed and that metrics will act in an integrated (balanced) way. It is over these ones that cause and effect linkages will be established. These cause and effect relations allow to check if the BSC is effectively reflecting the strategy of the organization. The objectives put on the basis of the BSC serve as inductors of the superior objectives, which, in a last analysis, will allow to reach the strategy. Moreover, these articulations allow to document and to transmit to several stakeholders the history of the strategy, making the relations between the measures explicit so that they can be monitored and managed.

The BSC concept, by itself, reflects some of the necessary assumptions for the application of this method, being the *balance* concept the centre of this system

At the software level, the computer industry developed several applications that allow to fully enjoy the benefits offered by BSC, making a sophisticated analysis, strategic mapping and information sharing available.

The goal of this work is to define the objectives of a health department, the Traumatology Department of the Hospital Garcia de Orta, as well as to determine the articulations between them that will provide the achievement of the department mission. It is still wanted to establish metrics that allow the evaluation of the objectives and, then, introduce those parameters in a software, which returns the desired data analysis and report, which in turn are capable of helping in the decisions, promoting the development of the best practices, the organizational learning and the reinforcement of the data responsibility principle.

### III. THE TRAUMATOLOGY DEPARTMENT OF THE HOSPITAL GARCIA DE ORTA

The Ortotraumatology Department of Hospital Garcia de Orta is a national reference in percutaneous foot surgery and in limb reconstruction and lengthening techniques by the Ilizarov method.

This department has functional units in several zones within the hospital, sharing work zones with the Rheumatology Department and with the Plastic Surgery Department.

Nowadays, the capacity of this department is of 18 beds, having received 717 patients in 2008.

Generically, it can be said that a patient which arrives to the Hospital Garcia de Orta with some kind of urgent bone or tendinous lesion, after triage at the emergency room, is observed by a physician that establishes the need of specific exams and/or analysis and, in case of considerably weakening of the patient, he proceeds to his rebalance (fracture stabilization, hemodynamic balance, electrolyte level control, pain treatment). If the patient has request an emergency service, this balance is sometimes initiated in the patient gathering place.

After medical evaluation, a diagnosis, which can culminate with the need of surgery intervention, is made.

If a surgery is needed, either the patient is immediately operated in the operating block available 24h a day or, if it is unavailable, the patient will have to wait, in hospital internment (hospitalization). In this last situation, the patient can be operated by deferred Traumatology (in a week there are 2 time slots available – Thursdays and Fridays –, in the following week there are 3 time slots– Mondays, Thursdays and Fridays –, consecutively alternating) or using additional surgery times (surgery block from 9am to 4pm and shared by many services). This last solution seems to be the most advantageous since it does not bring additional expenses to the hospital since the expenses are covered by the SNS; these time slots correspond to overtime hours made by physicians and nurses. The monitoring and availability of additional surgeries are regulated by the Sistema Integrado de Gestão de Inscritos para Cirurgia (SIGIC).

In extreme cases, orthopedic time slots are used. This is an impracticable situation since it contributes to the lengthening of waiting lists in orthopedic surgeries. However, in urgent situations, it becomes inevitable.

In Figure 1 it can be seen the Traumatology patient circuit in the HGO, being highlighted the hospital internment associates costs, the ones that most contributed to the total costs of the service.

Due to the large diversity in patients and pathologies, the Traumatology department is facing problems to which it cannot respond completely, being imperative that solutions are found.

These problems are essentially related with:

- Social problems: The number of elderly people continuously staying at the hospital is steadily increasing due to the inability of these health services to deal with the aging population in Portugal. For that, the social service developed by this department/hospital for gathering and monitoring, as well as in the psychosocial support of the elderly is extremely important when trying to solve some of these problems;
- Operating block response incapacity: this department deals almost exclusively with non-programmed patients, being difficult to meet all the needs;
- Lack of a performance measurement system: Although this department already has a coherent strategy and some indicators that permit to evaluate the consecution of the defined objectives, there is still a long way to go until a measurement culture, with available indicators, easily accessible to all the interested people, can be reached, as well as a communication strategy for this data.

### IV. METHOD

For the implementation of the chosen tool – BSC – a set of sequential steps, sometimes accompanied by some retrocessions, was followed. In a general way, it can be said that, in a first phase, the developed activities were:

- The preparation and involvement of the internal actors. These internal actors included the Traumatology Department director, who decides and has knowledge of the service's

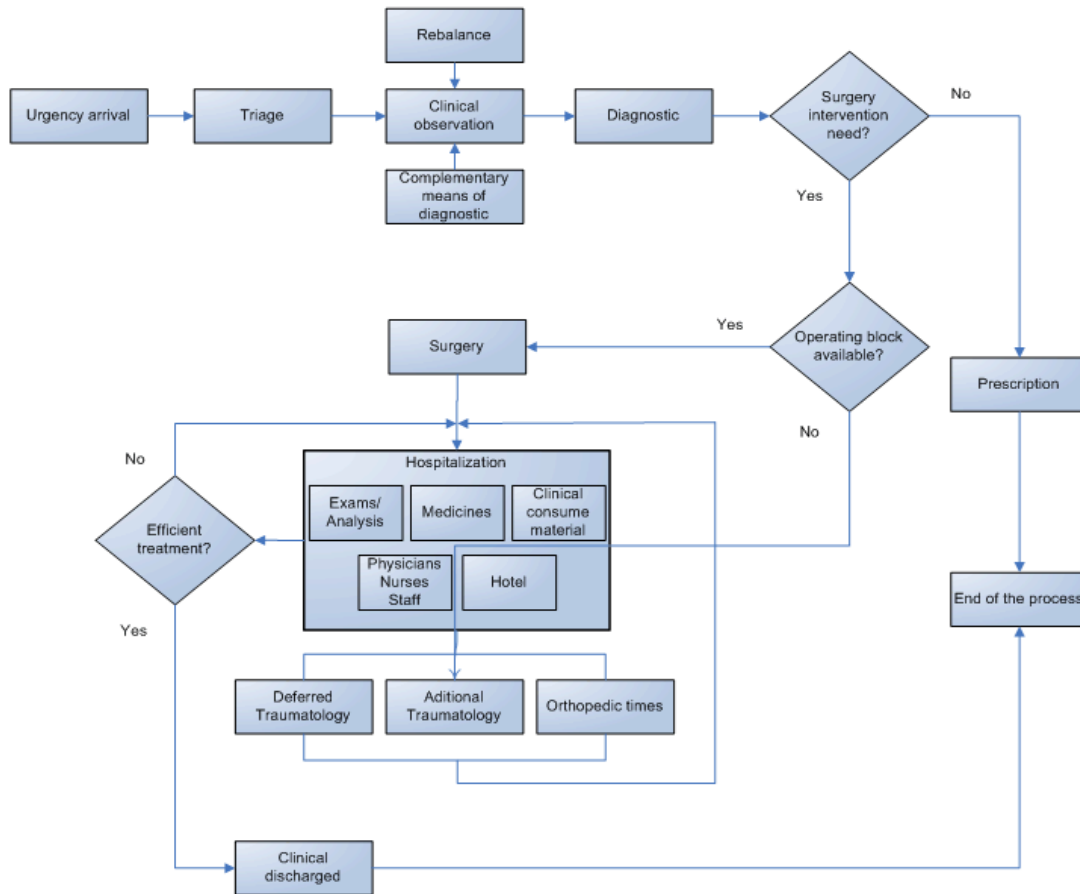


Figure 1 Traumatology patient circuit

strategic and functional base, the chief nurse, who detains a specific understanding of the unity, and the administrative responsible for the department that possesses all the relevant information;

- Information acquisition and data interpretation;
- Beginning of BSC construction.

In this first phase, the *Mission* and *Strategy* of the department were confirmed and the *Values* were developed. From here on, it was possible to determine the perspectives with which to work with and which objectives were fundamental; the determination of these objectives has, as a starting point, previously established objectives. Besides, it had already been tried to define some cause and effect linkages, as well as to determine the variables that could evaluate those objectives – the measures.

In a second phase, the followed steps were:

- Data acquisition, in which the identification of the needed and available information sources to the scorecards was done;
- Establishment of a measurement system;
- Design of a strategic map;
- Determination of targets and initiatives.

In a third and last phase, objectives and indicators were introduced in a software, together with the targets associated to each metric, with this one returning the current state of its prosecution.

It is still added that, despite the fact that this methodology has been introduced in a sequential way, the BSC tool is an iterative process with several adjustment and refinement loops, being not such a linear method.

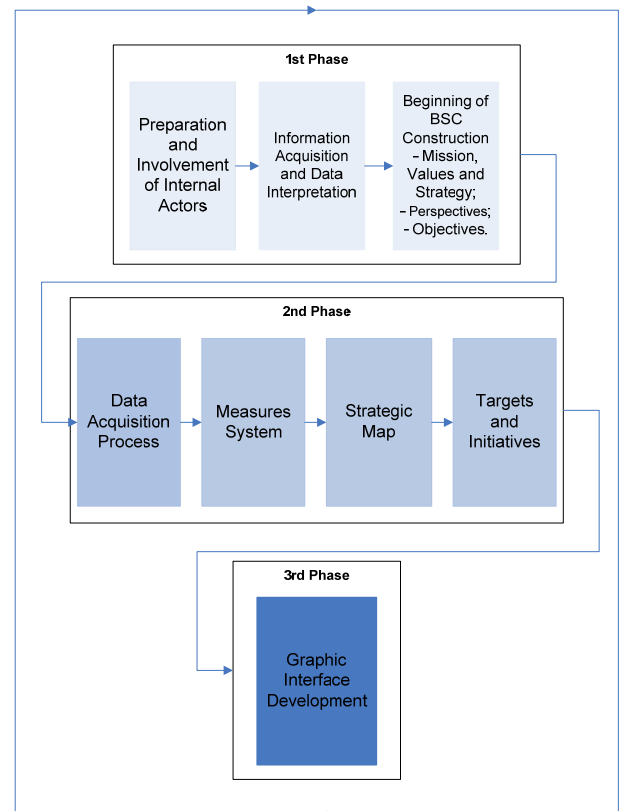


Figure 2 Schematic representation of the method followed in the BSC conception

**A. Defining Perspectives**

The first step in the construction of the Balanced Scorecard was the differentiation of the perspectives, from which the objectives that translate the mission and the strategy of the department would be distributed. In this way, the selected perspectives were:

- Patients/Stakeholders: In this perspective it was tried the inclusion of all the people who have interest for the quality of the department. The stakeholders included three dimensions – accountability, protection and compromise<sup>7</sup>.
- Budget: Here, it was wanted the inclusion of the main costs in order to accomplish the stipulated budget. This perspective was considered as important as the patients/stakeholders perspective.
- Internal Process: The aim of this perspective was to determine the essential processes that allow the reduction of costs and the rising of the satisfaction level of its patients/stakeholders. One intended to highlight the procedures that could be increased in order to get a better final service, with a more efficient resources allocation.
- Learning and growth: This perspective tries to underline the activities and actions that promote the development of all employees the most, as well as the ones that induce important beneficial changes. These contribute decisively in reaching the objectives defined in the previous perspectives.

Despite these perspectives not being exactly the same as the ones originally chosen by Kaplan and Norton<sup>1</sup>, they are not too unequal as well (table 1).

**Table 1** Comparison between the perspectives chosen to the HGO Traumatology service and the perspectives originally proposed by Kaplan and Norton<sup>1</sup>

BSC perspectives introduced by Kaplan e Norton <sup>1</sup>	Perspectives adopted to the Traumatology Department of the HGO
Financial	Budget
Customer	Patients/ <i>Stakeholders</i>
Internal Business	Internal Process
Innovation and Learning	Learning and Growth

**B. Developing Performance Objectives and Measures**

After the definition of the perspectives, the objectives that will be distributed to each one of them were determined.

These objectives are aimed to be meaningful and as clear as possible and they have to be perfectly aligned with the service’s mission and strategy. To guarantee that these objectives do not contribute to a confuse inertia, they must all be quantitative and should start with action verbs, so that their dynamic nature that guides how that strategy shall be executed can be emphasized.

In the measures choice and elaboration, more important than their number is their relevance and articulation with the objectives. However, as in the choice of objectives, it is convenient that these measures do not extent too much. A BSC with a large number of objectives and measures may not highlight what is essential, thus not being precise. For Niven, a good scorecard has three or four measures in the financial perspective, between five and eight in the customers' perspective, from five to ten measures in the perspective of the internal business processes and three to six measures in the base perspective, learning and growth<sup>11</sup>.

In the choice of the indicators, though there might exist others which could correspond better to the presented objectives, or that could complete the existent ones, the chosen indicators were the ones to which the data was available or, even if it was not, it is known that they exist, in informatic systems or in paper.

The selected objectives, as well as its measures, are summarized in Table 2.

**C. Setting Targets**

To guarantee that the strategy is well supported by the developed BSC system, it is necessary to associate target values to the indicators. The establishment of those values has as goal to motivate and drive the organization so it can reach reference performance levels.

When establishing targets to a hospital department it is essential to make use of the flexibility of BSC, since the exact and ambitious targets that characterize the private organizations cannot be transposed to a public one. The targets of a public hospital cannot often consist of objective values, but instead, of intervals that include possible targets.

The following presented targets are referred to 2009. To their establishment, data from previous years and the objectives of the organization were analyzed, benchmarking was done and meetings with the responsables for the service, other health professionals and people from the business world were held.

Despite not having been possible to get all the newest data or even any data for some indicators, the targets that were considered to make sense were stated, although not strongly supported by numerical data.

Most of the considered data is referent to 2007 because the measure values from 2008 would only be available in the course of 2009.

To the measures to which there was not found any data and that data was determinant to the definition of the targets, it was established, by default, that the target would be to maintain the values of previous years. It was the case of the indicator “Admitted-discharged (AD) days” and of the metrics referent to the Social Service activity and to the partnerships with Nurse Schools and the nurses coming from them.

The targets set to each measure are summarized in Table 2.

**D. Developing Cause and Effect Linkages: The Strategic Map**

After the determination of the objectives and the associated measures, it becomes essential to build the Traumatology department strategic map.

This map, for the fact that it is representing the visualization of all logical operacionalization referent to the cause and effect linkages that relate the objectives, indicators and, afterwards, targets and initiatives, is fundamental to the functions of focus and alignment of all organization.

The map designed to the Traumatology Department, supported in a cascading process, is shown in Figure 3.

**Table 2** Set of objectives, measures and targets defined to the Traumatology service of HGO

Objective	Measure	Metric	Targets
<b>Perspective: Patients/Stakeholders</b>			
Reduce the pain in the pos-operative period	<b>C01</b> Visual Analog Scale (VAS) indices	Number	6
Increase satisfaction levels in the department users	<b>C02</b> Complaints received	%	Reduce 50%
<b>Perspective: Budget</b>			
Reduce costs with clinical consume material	<b>F01</b> Costs with clinical consume material	Number (Euros)	Raises <15%
Reduce costs with people	<b>F02</b> Costs with people	Number (Euros)	Raises <15%
Reduce costs with medicine	<b>F03</b> Costs with medicine	Number (Euros)	Raises <15%
Reduce costs per service unit	<b>F04</b> Total costs of the Traumatology service	Number (Euros)	Raises <15%
<b>Perspective: Internal Processes</b>			
Give an answer to the criteria not accomplish and/or partially accomplish by the KING'S FUND audit	<b>P01</b> Criteria impose by the KING'S FUND audit which has been accomplish	%	100%
Improve good clinical practices	<b>P02</b> Readmission rate	%	Maintain <5%
	<b>P03</b> Mortality rate	%	Maintain <5%
Perfect the Traumatology patients access to the room of deferred Traumatology	<b>P04</b> Surgeries made by deferred Traumatology	Number	Raise 18%
Increase the number of additional surgeries	<b>P05</b> Surgeries made in additional times	Number	Raise 15%
Reduce the waiting times in urgent surgeries	<b>P06</b> Waiting time to urgent surgeries	Number (hours)	36h
Increase the efficiency of the Traumatologic emergency	<b>P07</b> Traumatology representativeness in the discharged numbers of the central emergency	%	≤ 2%
Promote the social reintegration	<b>P08</b> Procedures (social intervention, domiciliary intervention and psychosocial interview) done by the Social Service	%	Maintain
	<b>P09</b> Directions made by the Social Service	%	Maintain
	<b>P10</b> Discharged delay days	Number (days)	Maintain
Decrease the average length of stay	<b>P11</b> Average length of stay	Number (days)	6,4days
Decrease the duration of the given service	<b>P12</b> Admitted-discharged (AD) days	Number (days)	Maintain
Develop an efficient department occupation	<b>P13</b> Bed occupancy	%	70-80%
	<b>P14</b> Patient treated per bed	Number	Raise 5%
Reduce the appointment canceling rate	<b>P15</b> Appointment cancelling rate	%	Reduce 20%
<b>Perspective: Learning and Growth</b>			
Develop technical and human competences in the health professionals	<b>A01</b> Week hours dedicate to training	Number (hours/week)	5h/week
	Leader		5h/ week
	Assistants		2h/ week
	Administratives		5h/week
	Remaining professionals		
Promote conditions to the investigation and scientific information exchange	<b>A02</b> Congress representations	Number	Maintain 10-15
	<b>A03</b> Foreign interns received by the Intern Program of the <i>International Center for Orthopedic Education</i> (ICOE)	Number	Maintain 10-15
Maintain and establish collaboration with com Nurses Schools to train qualified nurses	<b>A04</b> Collaborations with Nurses Schools	Number	Maintain
	<b>A05</b> Nurses proceeding from Nurses School to which there's collaborations	%	Maintain

The placing of the perspectives patients/stakeholders and budget at a same level determines that the two perspectives placed in the base (internal processes and learning and growth) have to interact, in what concerns to objectives and cause and effect linkages, aiming, on the one hand, the creation of value to the clients and, on the other hand, the improvement in the use of the financial resources.

Starting from the base, growth and learning perspective, it was considered that the development of technical and human competences in health professionals, as well as the

investigation and exchange of scientific information, contribute in a straight way for an improvement of the good clinical practices.

The constant updating, as well as the professional and human enrichment, promote better treatments and services. These good practices, in turn, contribute to an increase in the department users' satisfaction levels, who begin to benefit from a department with better quality and to the KING'S FUND accreditation, giving answer to norm 21. To the KING'S FUND accreditation it also contributes the development of human and technique competences, because

its accomplishment relates directly with norm 20. The improvement of good clinical practices still allows a cost reduction because good practices lead to a decrease in the average length of stay, besides decreasing the readmission rate, which contributes to a cost raise, sometimes, unnecessary.

The establishment of collaborations with Nurses School, besides permitting the contact with students, who constitute sources of up-to-date information, many times involved in mutual interest projects, is another way to make possible the reduction/maintaining of costs as the intern nurses coming from these schools are not remunerated. The contribution of these nurses to the cost reductions is at a hospital internment level, being practically meaningless at other levels.

At the internal processes level, one of the main goals is to decrease the duration of the given services – emergency, surgery and hospital internment – acting these directly in the total duration of the given service. Influencing the hospital internment are also the actions carried out by the Social Service that, in turn, are highly connected to the continuing care units. In what waiting times to urgent surgery are concerned, they are essentially related with two possibilities that allow reducing that time - additional surgery and times to deferred traumatology.

Regarding the appointment cancelling rate, high values contribute to waste of time. The unanticipated cancelling or the non-realization of consults due to the patient not showing up (written up here as canceled) lead, often, to less productive days. This bad management of human resources is related, once again, with the raise of costs.

Still in the internal processes perspective, there is the development of efficient bed occupancy that is related, in an objective way, with the costs rationalization.

One of the main goals of the Traumatology Department is the pain reduction, the reason why this objective is in the patient/stakeholder perspective, a superior perspective. This sensorial experience analysis, in a post-operative period, contributes not only to a better patient comfort and, consequently, to a better patient satisfaction, but also to the prevention of potential complications and the promotion of the discharged precociousness, which directly contribute to the reduction of costs.

Concerning the budget perspective, the reduction of costs per service unit is possible with a better management of budgets and funds, promoted by the referred actions and by the reduction/cancellation of exploration deficit that is related, essentially, to the staff, medicines and levels of clinic consume products.

Based on these statements, the strategic map seen in Figure 3 was drawn.

### E. Solution (BSC) Design Over FOR XML

Using the XML (*Extensible Markup Language*) standard format, the BSC structure developed was reproduced in order to make the data visualization more practical and appellative.

For that, it was used a software – the FOR XML – developed by Fordesi company.

The data over the XML format was then extracted, transformed and loaded – ETL process – in a *data warehouse*.

To keep the several perspectives associated with the many dimensions the *Data mart*, OLAP (*On-Line Analytical Processing*) data structure, was used.

In the case of the developed solution, the *data mart* to the Traumatology Department is composed by the metrics: **Valor** and **Meta** (Value and Target) and by the dimensions **Perspectiva** (Perspective), **Objetivo** (Objective), **Indicador** (Measure) and **Tempo** (Time) in years.

To show the available interface in FOR XML the data corresponding to 2007 was selected and it was considered that the target that had been stipulated to 2006 would be the same that the ones that were chosen in this work to 2009 (Figure 4).

In the first column it is shown, by perspective, the several selected objectives, as well as the measures associated to them. In the second column, the available values to the several measures are presented. Where the value zero is seen, it means that, to that year, it was not possible to get any data. In the next column are presented the targets corresponding to the several measures. In some cases, despite the measure not being available, the target is, because independently of the value, that would be the ideal one. Although a possible abuse might be being committed, this intends to be just an illustrative example of what is possible to be done.

At the level of the targets, some details need to be highlighted. In this column it is ideal to have just one value. If that is relatively easy to some industries, to health organizations that is not the objective. For instance, in the case of bed occupancy there is no ideal specific value, but if it is between 70 and 80% there is a good bed occupancy. In these cases, the value selected to appear was the lower value, but the software knows that for any value comprised between 70 and 80% it returns *green*. This situation can introduce some ambiguities but an option had to be taken.

In the fourth column, the state of the target accomplishment is returned. If it has been accomplished it returns green, if it has not, it returns red. In cases that there is no value to the metric, the software returns red by default.

In the fifth and last column the way to calculate the metric is described. If there is no description, it implies that the measure results from cumulative data.

Through the FOR XML software it is also possible, using the *Painel de Gestão* (Management Panel), to obtain a graphic representation of the values associated with the measures, as well as more detailed descriptions of the provided data. That information could be selected according to the requested time space.

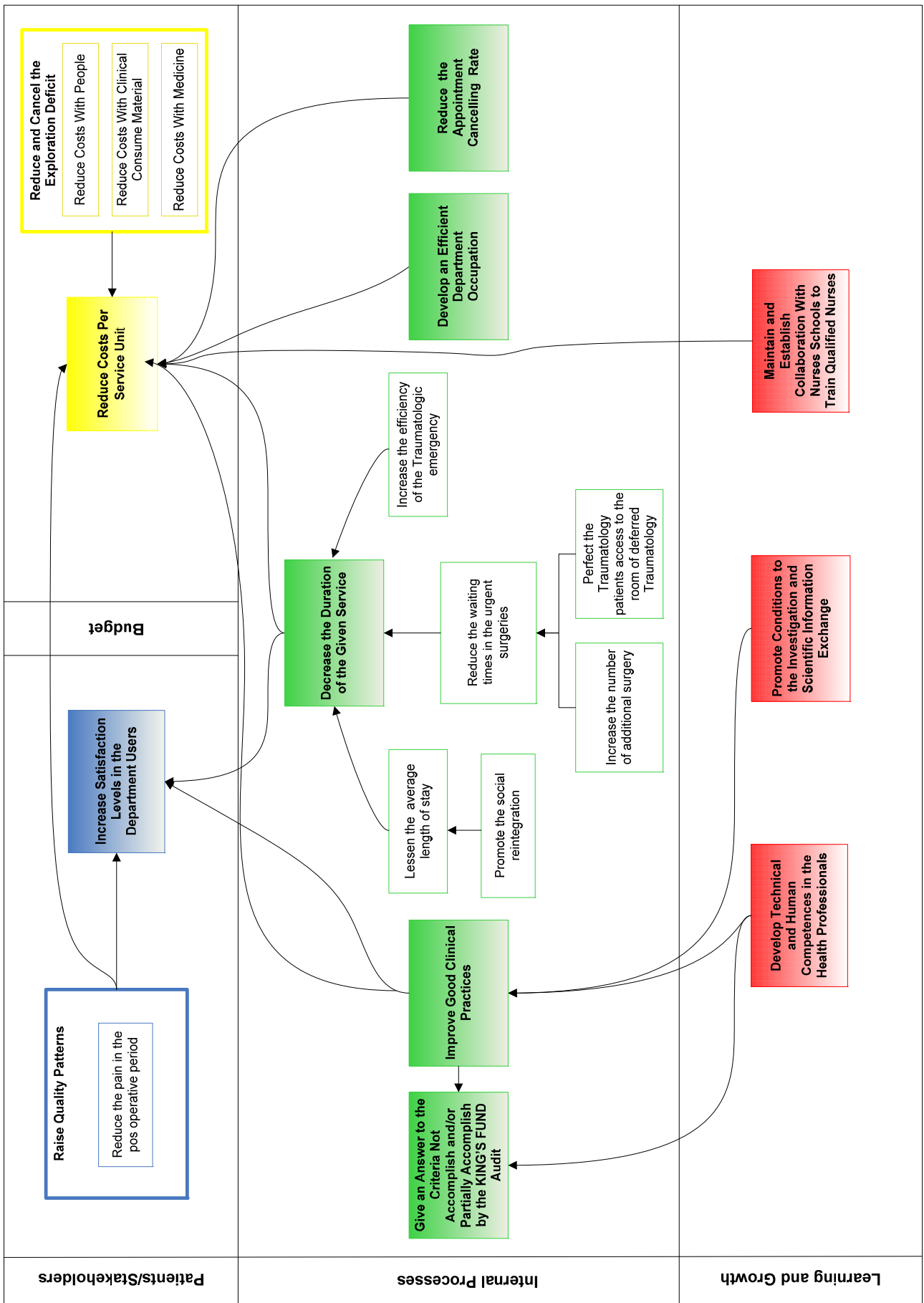


Figure 3 Strategic map developed to the Hospital Garcia de Orta Traumatology Department



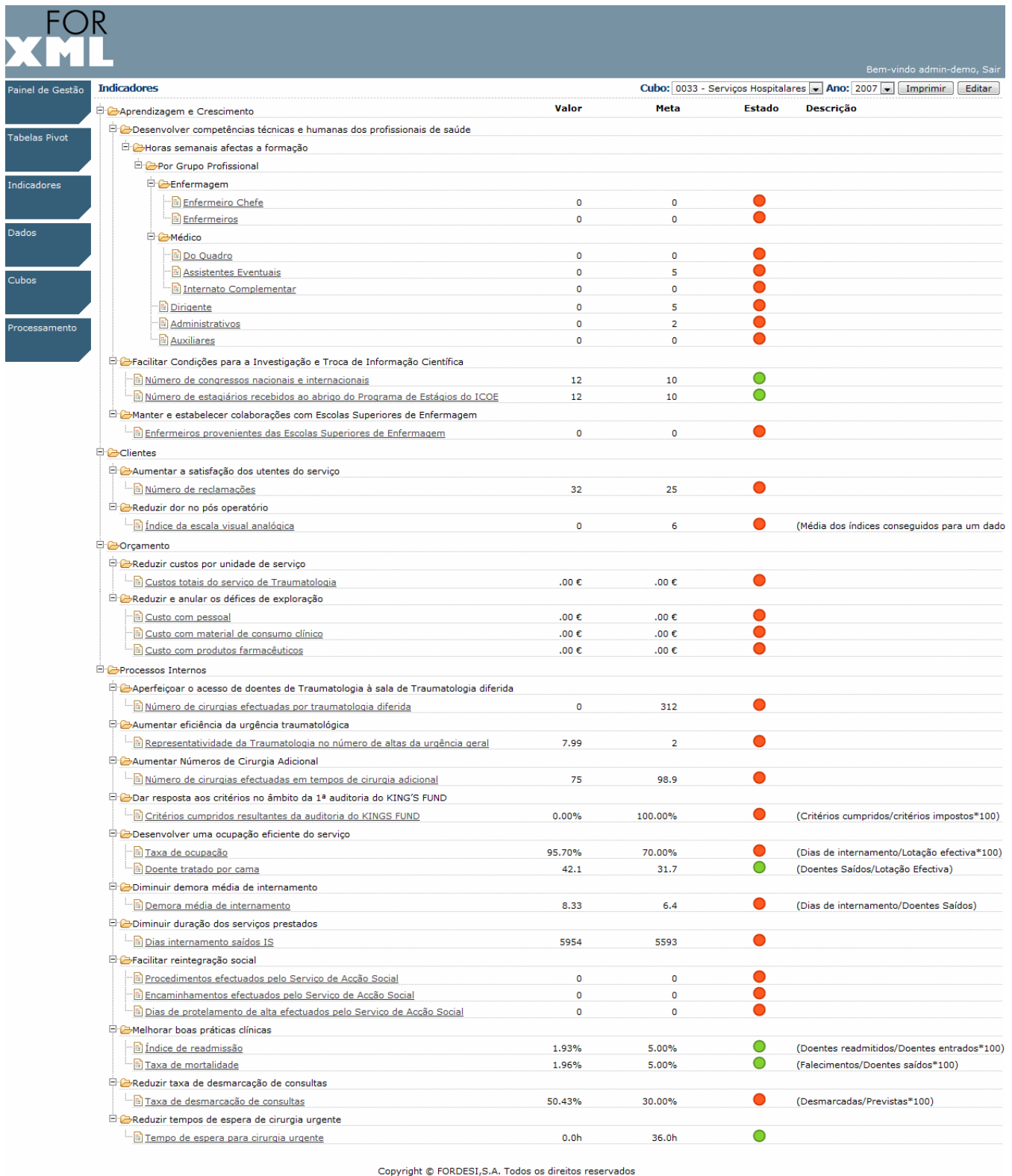


Figure 4 Interface available by FOR XML to the data visualization

## V. CONCLUSIONS AND FUTURE WORK

In this work, a performance measurement tool, the Balanced Scorecard (BSC), was implemented with success in the Traumatology Department of Hospital Garcia de Orta.

In the development of any kind of methodology that allows a performance measurement of a determined public service, regarding the research of solutions and help in decision making, one has to be conscious that the many problems that these departments face do not have a straight forward

solution and the available resources are, frequently, insufficient to face it efficiently.

Besides, in departments with state budgets, interests of several levels compete, having sometimes more worries in the adoption of compromise solutions than in the practice of rigorous principles and management concepts.

In the course of the BSC implementation it could not be ignored that some of the health sector intervenients considered inappropriate to transpose to this environment management models commonly used in entrepreneurship unities that look for profits. This will be, by chance, one of the main contrast elements between the so-called "traditional" vision, and the vision that should prevail from now on. Not being a business, in the strict sense of the word, reports of health inefficiencies that need an answer are frequent.

The fact that one is dealing with a public health organization demanded some alterations in the model initially proposed by Kaplan and Norton. One of those changes was at the perspectives level. It was important to clarify the client concept, identify the public health department target market and to understand the needs of the constituents of that market in order to better serve them.

In the end, it was obtained a scorecard with 20 objectives, 26 measures, distributed for 4 perspectives: patients/stakeholders, budget, internal processes and growth and learning.

For the realization of the work, gathering of numeric data and relevant useful information were one of the fundamental steps, not only to the understanding of the service work model, but also to the progression of the methodology. However, these ended up being one of the hardest tasks in the whole process. To that, five main difficulties have contributed:

- The ignorance of the existence, or if it did not exist, of the existence, of certain measures by clinical people and administrators;
- Knowledge of the existence of certain measures, however, not of the responsible person that could give them;
- Incapacity of extracting data from the information systems;
- Dispersal of information;
- Conflicting data.

It is still referred that for the Hospital Garcia de Orta, there is not any *vision* defined. The *vision*, for the fact that it is related directly with the long term objectives, as well as with the future aspirations, should appear in the definition of the Hospital, so its conception is suggested.

Simultaneously with the objectives and measures definitions, it was started to be built the strategic map. Its development shows to be very useful, allowing the detection of inconsistencies and gaps in the cause and effect linkages, demanding lots of attention by the department director and remaining team. However, the final product offers a graphic description of the strategy, making it more understandable and susceptible to receiving valuable inputs from lots of sources. Still, a periodic revision is needed, not only at the strategic map level, but also at the measures level, to guarantee that these are updated.

Regarding the used software, FOR XML, it is highlighted how easy it is to handle it and the very appellative interface that allows a continuous analysis of the measures values, as well as its state compared to the established targets.

However, there are some improvements that can be done. To begin with, it would be determinant to have annual values for all the measures. A deeper knowledge about the location of this data, as well as of the way of extracting it from the information applications, is the basis of the development of this kind of platforms. Ultimately, what was intended was to discriminate at a greater level of detail, such as monthly or even weakly, which would allow an analysis almost in real time of all situations.

The BSC reveals to be a useful tool, allowing that a short set of measures could quantify the following of the defined strategy, at the same time that providing the information that some changes must be done to face the detected diversions.

The implemented tool, the BSC, should be seen as a system which injects in the decision process objective information and oriented to the results, and not as a system that is aimed to effectively control the decisions.

With the BSC it was possible to help the department director to monitor the performance and understand if the department is on its way to reach the mission.

As future developments, the logical step would be the practical implementation of the BSC and analysis of the results that would be obtained. However, it would need a middle/long term (at least one more year) commitment. Consequently, this evidence cannot be shown in this work.

If the application of this methodology would reveal satisfactory results, one would suggest the dissemination throughout the hospital, starting in the corporative level, followed by the slow diffusion for the remaining departments.

The dissemination is indispensable since it allows to draw a line of vision for the whole staff, being this a key factor for the success of the BSC programs.

From the exposed, it was concluded that the healthcare organizations management should consider the adoption of modern management tools that include performance measures correctly implemented to face the current changes in the businesses environment.

Nowadays, the healthcare organizations need, more than ever, to reduce costs, increase quality, and follow straight guidelines.

It is vital that there exist systems that allow the alignment of the different interest perspectives that cohabit in a hospital – budget, internal processes, patients/stakeholders, learning and growth – and that show how the fulfillment of the objectives from one of them is possible and how they are related. So it becomes possible to identify the strengths of the involved people, as well as the areas that need improvements. The BSC is, in this way, a unique tool, and the validity of its application in a health department was demonstrated.

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