Descriptive study of the Specialized Care of the Spanish Health System

Karen Nombela-Monterroso¹, Víctor M González-Chordá¹, Pablo Roman¹,²

¹ Universidad Jaume I. Departamento de Enfermería. Castellón, España
² Universidad de Almería. Departamento de Enfermería, Fisioterapia y Medicina. Almería, España

ABSTRACT

OBJECTIVE: The objective of this study is to analyze the trend of the Key Indicators of the National Health System of Spain and its autonomous communities, related to Specialized Care, from the publication of the Law of Cohesion and Quality.

METHODS: This is an ecological study of temporary series of Spain and its autonomous communities from 2003 to 2014. We have analyzed 10 indicators related to Specialized Care (percentage of expenditure, professionals, waiting lists, surgical activity, average duration, infections, and mortality) using the Prais-Winsten regression method. We have obtained data from the health information system of the Spanish Ministry of Health, Social Services, and Equality.

RESULTS: Specialized care expenditure (APC = 0.059, 95%CI 0.041–0.074), number of medical professionals (APC = 0.0006, 95%CI 0.0003–0.0009) and nursing professionals (APC = 0.001, 95%CI 0.0005–0.0016), hospital infections (APC = 0.0003, 95%CI 0.0002–0.0004), and in-hospital mortality (APC = 0.0008, 95%CI 0.0006–0.001) had an increasing trend in Spain. Average duration presented a decreasing trend (APC = -0.0017, 95%CI -0.002– -0.0014). The trend of waiting lists (specialized appointment and non-urgent surgical interventions) was static. The trend of these indicators varied in the Autonomous Communities.

CONCLUSIONS: We have observed a non-compliance with the principles of equity and quality of the services offered. Increased aging, technological development, and inadequate strategies taken to reduce health costs may be the main causes.

DESCRIPTORS: Health Services. Tertiary Healthcare. Quality Indicators, Health Care, trends. Health Care Quality, Access, and Evaluation. Ecological Studies.
INTRODUCTION

A health system aims to improve the health status of its population with curative, preventive, and rehabilitative care and it is influenced by the political, social, cultural, and economic context of the country in which it is developed. There are different models of health systems, among them, the National Health System (SNS), currently existing in Spain related to the General Health Law of 1986. Its main characteristics are the right of every citizen to health protection, public financing, and provision of services that ensure the quality of care, among others.1–3

On the other hand, among the principles and criteria of this law, we can find the decentralization of health in Autonomous Communities (AC), granting to each one the responsibility of meeting the health of its citizens. The decentralization process, finalized in 2001, had the objective of adapting the health management to the territorial and demographic characteristics of each AC. In 2003, the Law of Cohesion and Quality of the SNS (LCC-SNS) was published to ensure citizen participation, quality, and equity of the health care throughout the country. This law understands equity as the right to health protection in conditions of effective equality throughout the territory that allows the free movement of all citizens.1

Decentralization processes are justified by advantages such as the adequacy of services to the needs of each territory, the approximation of institutions to citizens or the development of alternative management models, and a source of learning. Thirteen years after the publication of the LCC-SNS, the lack of health equity is one of the main problems deriving from decentralization, especially regarding expenditure and financing, health status of citizens, access to health care, and use of resources.

The LCC-SNS revealed the importance of professionals in the quality of the system and research in the development and effectiveness of health services. It also highlighted the need to address the most prevalent health problems with the elaboration of strategic plans that determine minimum care standards and basic care models, while ensuring the sustainability of the SNS. The Royal Decree-Law 16/2012, of urgent measures to ensure the sustainability of the SNS and to improve the quality and safety of its services, was published to address the serious economic situation and the increase in health expenditure, although its application caused economic austerity with significant repercussions in the SNS.

On the other hand, the LCC-SNS entrusts to the Ministry of Health the creation of a Health Information System to ensure the availability of information and communication between the Administration of the Government and the AC.

In this system, we can find the “Key Indicators of the SNS”, which provide, in an integrated and systematic way, data on health expenditure, use of resources, accessibility to services, quality of care, and level of health of the population. This allows us to objectify a determined health situation, evaluate its behavior over time, and know if the proposed objectives and the expected results are achieved to establish improvement actions.

The objective of this work was to analyze the evolution of the Key Indicators of the SNS of Spain and its AC, related to Specialized Care (SC) after the Law of Cohesion and Quality.

METHODS

This is an ecological study of time series that analyzed the trend of the Key Indicators of the SNS of Spain and its AC, using the Health Information System of the Ministry of Health, Social Services, and Equality related to SC.
We included data from the indicators since 2003, which is when the LCC-SNS came into force, until 2014, the last year with information available in the Health Information System\textsuperscript{11} for the selected indicators.

Trend estimation was based on the calculation of annual percentage change (APC) and its 95% confidence intervals (95%CI), using the Prais-Wisnent regression method for the analysis of time series, which allows us to obtain an overall trend for a given period\textsuperscript{12}. The analysis was performed on all indicators for the SNS and each AC using the program Stata 14.0 (2015).

**RESULTS**

The percentage of expenditure dedicated to SC in Spain increased by 9.5 points between 2003 and 2014, from 46.3\% to 55.8\%, with an increasing trend (APC = 0.059, 95\%CI 0.041–0.074). We observed an increasing trend in expenditure dedicated to this level of care in thirteen AC, while the trend was static in four AC (Cantabria, Aragon, Balearic Islands, and Madrid). Catalonia was the AC with the greatest increase in SC expenditure (APC = 1.367, 95\%CI 0.319–5.731). We observed no decrease of the indicator in any AC, although information for this indicator for Ceuta and Melilla was not available.

The number of nursing and medical professionals per 1,000 inhabitants in Spain showed an increasing trend for nursing (APC = 0.001, 95\%CI 0.0005–0.0016) and medical professionals (APC = 0.0006, IC95\% 0.0003–0.0009). Melilla presented a static trend in both indicators and Ceuta had a decreasing trend in the number of physicians (APC = -0.0013, 95\%CI -0.0013–0.0001) (Table 1).

The rate of patients on waiting lists for specialized appointments (APC = 0.001, 95\%CI -0.006–0.008) and the number of patients waiting for non-urgent surgical interventions (APC = 0.001, 95\%CI -0.001–0.003) showed a static trend in both cases for Spain. The analysis of the evolution of these indicators from the AC could not be performed because the data were not available.

Working operating rooms reached a total of 9.4 per 100,000 inhabitants in Spain in 2014, with an increasing trend (APC = 0.002, 95\%CI 0.001–0.003). Navarre (APC = -0.0008, 95\%CI -0.001–0.0001), Ceuta (APC = -0.003, 95\%CI -0.004–0.001), and Melilla (APC = -0.005, 95\%CI -0.007–0.005) showed a decreasing trend, while 11 AC had an increasing trend and five remained static (Valencia, Castile and León, Canary Islands, Balearic Islands, and Cantabria).

---

**Box. List of selected indicators.**

| Indicators                                             | Formula                                                                 |
|--------------------------------------------------------|-------------------------------------------------------------------------|
| Percentage of expenditure on specialized care services | (Public health expenditure in hospital and specialized services / Total current public health expenditure) x 100 |
| Nursing staff in specialized care per 1,000 inhabitants | (Number of nurses / Population) x 1,000                                  |
| Specialized medical staff per 1,000 inhabitants        | (Number of physicians / Population) x 1,000                              |
| Patients waiting for specialized care appointments     | (Number of patients pending an initial appointment in Specialized Care / Population) x 1,000 |
| Working operating rooms per 100,000 inhabitants        | (Number of working operating rooms / Population) x 100,000              |
| Surgical interventions per 1,000 inhabitants           | (Total number of surgeries performed in one year / Population in that year) x 1,000 |
| Patients waiting for non-urgent surgical interventions per 1,000 inhabitants | (Number of patients pending a non-urgent surgical intervention / Population) x 1,000 |
| Average duration                                       | Average days of stay of the valid total discharges                      |
| Rate of hospital infection                              | (Number of hospital discharges with nosocomial infection diagnosis in one year / Total discharges in that year) x 100 |
| Global in-hospital mortality per 100 hospital discharges | (Total number of hospital discharges per death / Total discharge) x 100 |
Surgical interventions in Spain showed an increasing trend in the period studied, going from 95.2 to 107.6 interventions per 1,000 inhabitants (APC = 0.292, 95%CI 0.047–1.589). This rate kept an increasing trend in 10 AC and a static trend in six AC (Balearic Islands, Murcia, La Mancha, Andalusia, Navarre, and Melilla). This indicator showed a decreasing trend in the Canary Islands (APC = -0.006, 95%CI -0.008– -0.001), Ceuta (APC = -0.009, 95%CI -0.01– -0.008), and Cantabria (APC = -0.009, 95%CI -0.01– -0.009).
The average stay of patients in 2014 (Table 2) was 7.6 days in Spain, with a decreasing trend (APC = -0.0017, 95% CI -0.002 – -0.001). This indicator has declined in recent years in all AC, although the trend can be considered as static in four of them.

We observed an increase of 0.16 points in the rate of hospital infections in Spain, going from 1.2 in 2003 to 1.3 in 2013, with an increasing trend (APC = 0.0003, 95% CI 0.0002–0.0004) (Table 3).

The increase in in-hospital mortality in Spain was 0.3 points, going from 3.9 to 4.2 per 100 hospital discharges in the period studied, with an increasing trend (APC = 0.0008, 95% CI 0.0006–0.0011) (Table 4).

DISCUSSION

The data show an increasing trend in the indicators of expenditure on SC services, nursing and medical staff in SC per 1,000 inhabitants, working operating rooms per 1,000 inhabitants, surgical interventions per 1,000 inhabitants, rate of hospital infections, and in-hospital mortality for every 100 hospital discharges. Nevertheless, we observed a decreasing trend in the indicator of average duration. Similarly, we found a static trend in the indicators of patients waiting for specialized care appointments and patients waiting for non-urgent surgical interventions per 1,000 inhabitants.

Health expenditure on SC has been increasing in most Autonomous Communities. However, high health expenditure to address these problems is not a sufficient condition to ensure good public health or good quality of the services. Regardless of a greater or lesser expenditure, the services provided need to have greater efficiency13.

This increase in health expenditure on SC can be related to the demographic change and technological development14, although it clearly contradicts the principles of health promotion and disease prevention of the General Health Law2. A good strategy to foster

Table 2. Indicator: average duration in descending order. Spain, 2003–2014.

| AC            | 2003 | 2014 | APC   | 95% CI  | Trend     |
|---------------|------|------|-------|---------|-----------|
| Ceuta         | 5.73 | 5.55 | -0.0004 | -0.0015–0.0008 | Static   |
| La Mancha     | 7.27 | 7.1  | -0.0005 | -0.001–0.0001 | Static   |
| Castile and León | 7.49 | 7.2  | -0.0005 | -0.001–0.0001 | Static   |
| Murcia        | 6.89 | 6.54 | -0.0007 | -0.0018–0.0005 | Static   |
| Navarre       | 7.12 | 6.77 | -0.0011 | -0.0017–0.0003 | Decreasinga |
| Balearic Islands | 7.11 | 6.63 | -0.0011 | -0.0015–0.0006 | Decreasinga |
| Extremadura   | 7.16 | 6.4  | -0.0014 | -0.0017–0.0012 | Decreasinga |
| Aragon        | 7.86 | 7.14 | -0.0015 | -0.0023–0.0007 | Decreasinga |
| Catalonia     | 6.94 | 6.22 | -0.0015 | -0.0019–0.0011 | Decreasinga |
| Asturias      | 8.64 | 7.71 | -0.0017 | -0.0021–0.0013 | Decreasinga |
| Spain         | 7.64 | 6.83 | -0.0017 | -0.0020–0.0014 | Decreasinga |
| Andalusia     | 7.81 | 6.9  | -0.0018 | -0.0021–0.0015 | Decreasinga |
| Canary Islands | 9.21 | 8.36 | -0.0019 | -0.003–0.0006 | Decreasinga |
| Basque Country | 7.22 | 6.46 | -0.0019 | -0.0028–0.0008 | Decreasinga |
| Valencia      | 6.70 | 5.86 | -0.0019 | -0.0022–0.0015 | Decreasinga |
| Galicia       | 8.99 | 7.94 | -0.002  | -0.003–0.0008 | Decreasinga |
| La Rioja      | 6.95 | 5.8  | -0.0021 | -0.0027–0.0015 | Decreasinga |
| Madrid        | 8.64 | 7.27 | -0.0025 | -0.003–0.0021 | Decreasinga |
| Cantabria     | 8.17 | 6.84 | -0.0026 | -0.0033–0.0019 | Decreasinga |
| Melilla       | 6.88 | 5.56 | -0.003  | -0.0039–0.0008 | Decreasinga |

AC: autonomous community; APC: annual percent change

a Significance level p < 0.05.
b Significance level p < 0.001.
### Table 3. Indicator: hospital infection rate in descending order. Spain, 2003–2014.

| AC               | 2003 | 2014 | APC  | 95%CI          | Trend          |
|------------------|------|------|------|----------------|----------------|
| Canary Islands   | 1.2  | 1.7  | 0.0012 | 0.0003–0.0014 | Increasinga    |
| Balearic Islands | 1.0  | 1.5  | 0.0011 | 0.0008–0.0014 | Increasingb    |
| Galicia          | 1.1  | 1.3  | 0.0008 | -0.001–0.0016 | Increasingg    |
| Andalusia        | 1.1  | 1.5  | 0.0009 | 0.0006–0.0013 | Increasingg    |
| Valencia         | 0.6  | 0.8  | 0.0006 | 0.0004–0.0008 | Increasingg    |
| Murcia           | 0.8  | 0.9  | 0.0003 | 0.0001–0.0006 | Increasingg    |
| Spain            | 1.2  | 1.2  | 0.0003 | 0.0002–0.0004 | Increasingg    |
| Asturias         | 1.4  | 1.4  | 0.0002 | -0.001–0.0015 | Static         |
| Catalonia        | 1.2  | 1.2  | 0.0001 | -0.0046–0.0009 | Static         |
| La Mancha        | 1.1  | 1.1  | 0.0001 | -0.0002–0.0004 | Static         |
| Basque Country   | 1.1  | 1.2  | 0.0001 | -0.0002–0.0004 | Static         |
| Madrid           | 1.4  | 1.4  | < 0.0001 | -0.0003–0.0004 | Static         |
| Navarre          | 0.8  | 0.7  | < 0.0001 | -0.0003–0.0003 | Static         |
| La Rioja         | 1.2  | 1.0  | -0.0002 | -0.0008–0.0004 | Static         |
| Ceuta            | 1.1  | 0.8  | -0.0003 | -0.0011–0.0006 | Static         |
| Cantabria        | 2.1  | 1.9  | -0.0004 | -0.0008–> -0.0001 | Decreasingg    |
| Extremadura      | 1.0  | 0.8  | -0.0005 | -0.0007– -0.0002 | Decreasingg    |
| Aragon           | 1.5  | 1.2  | -0.0006 | -0.0008– -0.0004 | Decreasingg    |
| Castile and León | 1.6  | 1.3  | -0.0006 | -0.0838– -0.0399 | Decreasingg    |
| Melilla          | 1.3  | 0.5  | -0.0016 | -0.0019– -0.0014 | Decreasingg    |

AC: autonomous community; APC: annual percent change

a Significance level p < 0.05.
b Significance level p < 0.001.

### Table 4. Indicator: global in-hospital mortality per 100 hospital discharges in descending order. Spain, 2003–2014.

| AC               | 2003 | 2014 | APC  | 95%CI          | Trend          |
|------------------|------|------|------|----------------|----------------|
| La Mancha        | 4.2  | 4.7  | 0.0037 | < 0.0001–0.0067 | Increasinga    |
| Extremadura      | 3.8  | 4.8  | 0.0029 | 0.0019–0.0039 | Increasingb    |
| Navarre          | 3.2  | 4.6  | 0.0026 | 0.0008–0.0048 | Increasingg    |
| Galicia          | 4.5  | 5.3  | 0.0025 | 0.0019–0.0031 | Increasingg    |
| Canary Islands   | 3.7  | 4.8  | 0.0023 | 0.0015–0.0033 | Increasingg    |
| Andalusia        | 4.1  | 4.7  | 0.0021 | 0.0018–0.0024 | Increasingg    |
| Castile and León | 4.1  | 5.0  | 0.0018 | 0.0012–0.0023 | Increasingg    |
| Ceuta            | 3.4  | 3.7  | 0.0009 | < 0.0001–0.0018 | Increasingg    |
| Spain            | 3.9  | 4.2  | 0.0008 | 0.0006–0.0011 | Increasingg    |
| Asturias         | 4.5  | 5.2  | 0.0008 | -0.0003–0.0621 | Static         |
| Basque Country   | 3.9  | 4.0  | 0.0008 | -0.0003–0.0002 | Static         |
| Balearic Islands | 3.2  | 3.5  | 0.0007 | 0.0003–0.001   | Increasingg    |
| Murcia           | 3.5  | 3.6  | 0.0005 | -0.0003–0.0015 | Static         |
| Valencia         | 3.9  | 4.0  | 0.0004 | 0.0001–0.0008 | Increasingg    |
| Aragon           | 4.2  | 4.4  | 0.0001 | -0.0002–0.0005 | Static         |
| Catalonia        | 3.6  | 3.2  | -0.0004 | -0.0008–0.0001 | Static         |
| Melilla          | 3.8  | 4.0  | -0.0005 | -0.0012–0.0003 | Static         |
| Cantabria        | 5.1  | 4.7  | -0.0006 | -0.0012–0.0001 | Static         |
| Madrid           | 4.0  | 3.9  | -0.0006 | -0.0064– -0.0002 | Decreasingg    |
| La Rioja         | 3.7  | 3.3  | -0.0007 | -0.0012– -0.0002 | Decreasingg    |

AC: autonomous community; APC: annual percent change

a Significance level p < 0.05.
b Significance level p < 0.001.
healthy living habits and prevent disease is the development of primary care. This would avoid unnecessary demand for SC. We observed an increase of 9.5 points in health expenditure on SC between 2003 and 2014 when compared to primary care expenditure, which went from 13.9% in 2003 to 13.4% in 2014, with a decrease of 0.5 percentage points. Thus, it seems appropriate to analyze whether the increase in the frequency and resources at the SC level presupposes a decrease of resources destined to primary care. This could strengthen the role of primary care in the SNS to reorient the current centrist hospital approach of the SNS.

On the other hand, there are many factors that can influence the increase of these costs, such as the use of resources and clinical variability, the low integration between care levels, the adoption of new technologies, or the increase in aging and less health habits that require greater care. All these factors imply a challenge for the SNS, as the need to put into operation new health management strategies is evident. Competency management can be one of these strategies, with a greater involvement of professionals, citizens, and administrations to address this problem, since it ensures the sustainability of the health system in relation to the costs related and adapted to the needs of society.

The increase in SC expenditure contrasts with key indicators that assess the quality of care, such as the increase in the rate of hospital infections and in-hospital mortality. These aspects could be related to the inadequate prevention of nosocomial infections, the high workload of professionals, the increase in the number of older patients whose health condition is more severe, or the increase in the multiresistance of some microorganisms. More studies are needed to discern these causes, especially to determine if these infections could be avoided and to establish measures such as increasing the competence of professionals for their prevention.

Another indicator that measures the situation of the SC and that contrasts with those mentioned previously is the average duration, used to determine the level of hospital efficiency. We verified a decrease of this indicator in all AC, except Ceuta, La Mancha, Castile and León, and Murcia which show a static trend. This decrease can be justified by advances in the diagnosis and treatment of diseases and technological innovations. The SC improves when the hospital stay is prolonged, which is a worldwide concern for the negative effects that it entails, such as: increased costs, saturation of services, and decreased quality of care regarding the risks of adverse events. However, the rate of nosocomial infections and the rate of in-hospital mortality in Spain kept increasing trends in the period.

Despite showing an increasing trend in Spain and some AC in the temporary series, the number of professionals in both groups decreased in Spain and in most of the AC in 2012, and it gradually recovered in some cases. This likely comes from the onset of the economic crisis and the consequences of the cuts, which affected each area with different intensity and pace of application, increasing inequality and calling into question the cohesion of the public health system. In addition, the nurse-patient rate is low when compared to the average of the countries of the Organization for Economic Co-operation and Development (OECD) (5.2 per 1,000 inhabitants compared with the 8.8 recommended by the organization). Spain is the country number 28 of 34, of all OECD countries. However, the physician-patient rate (3.8) is above that recommended by the OECD (3.2).

According to Price Waterhouse Coopers, not every strategy is valid to ensure the sustainability of a health system in a context of economic crisis. Measures aimed at reducing expenditure, rather than improving efficiency, should not be adopted without a long-term view of the consequences that may be incurred. Economic cuts and inefficient management increasingly affect professionals and consequently the quality of care, forgetting that the goal of the SNS is to improve the well-being and satisfaction of users.

Despite the increasing trend of working operating rooms and surgical interventions per 1,000 inhabitants, along with the increasing trend of nursing and medical staff and increased SC expenditure, we observed a static trend in patients waiting for non-urgent surgical interventions in the study period. This is another example of the inadequate use of resources.
in SC and it manifests the problems of sustainability and the possibility of improving resource management. More attention should be given to how money is spent before choosing to increase the funding of a service. However, the data removed by the AC are missing. Therefore, we cannot relate if this increase is because of those AC that did not increase their resources.

On the other hand, we need to consider a series of limitations, such as the lack of data from the AC for some indicators (for example, surgical waiting lists), which require us to consider this analysis with caution and see it as approximate. Research studies need to be developed with correlated methodological projects that allow the further study on the causes that have led to the decrease of most of the indicators of SC during the studied period. This would allow the establishment of measures to meet the needs of the population, taking into account the criteria of quality of care, equity, and cost-benefit of interventions. A study of interrupted time series of the indicators of the SNS would allow the analysis of the impact of the Royal Decree-Law 16/2012, on urgent measures, to ensure the sustainability of the SNS and improve the quality and safety of its care.

The analysis of the evolution of the Key Indicators of the National Health System of SC shows how the principles are not being complied with for the equity and quality of care offered. The main causes may be increased aging, technological development, and inadequate strategies being taken to reduce health costs without bearing in mind the consequences that can be produced in the medium and long term. Despite the increase in health expenditure on SC, we observed a worsening in key health quality indicators.

REFERENCES

1. Macia Soler ML, Moncho Vasallo J. Sistema Nacional de Salud Español: características y análisis. Enferm Global. 2007 [cited 2016 Jun 20];6(10):1-14. Available from: http://revistas.um.es/eglobal/article/view/256/260
2. Jefatura del Estado (ESP). Ley 14/1986, de 25 de abril 1986, General de Sanidad. Bol Oficial Estado. 29 abr 1986 [cited 2016 Jun 20]. Available from: https://www.boe.es/buscar/pdf/1986/BOE-A-1986-10499-consolidado.pdf
3. Ministerio de Sanidad, Servicios Sociales e Igualdad (ESP). Sistema Nacional de Salud España 2012. Madrid; 2012 [cited 2016 Jun 21]. Available from: https://www.msssi.gob.es/organizacion/sns/docs/sns2012/SNS012__Espanol.pdf
4. Sevilla F. La universalidad de la atención sanitaria. Sistema Nacional de Salud y Seguridad Social. Madrid: Ministerio de Trabajo y Asuntos Sociales; 2006 [cited 2016 Jun 21]. Available from: http://www.seg-social.es/prdi00/groups/public/documents/binario/51587.pdf
5. Jefatura del Estado (ESP). Ley 6/2003, de 28 mayo de 2003, de cohesión y calidad del Sistema Nacional de Salud. Bol Oficial Estado. 29 mayo 2003 [cited 2016 Jun 20]. Available from: https://www.boe.es/buscar/pdf/2003/BOE-A-2003-10715-consolidado.pdf
6. Antón Pérez JJ, Muñoz de Bustillo Llortente R, Fernández Macías E, Rivera Navarro J. Evaluación del proceso de descentralización del Sistema Nacional de Salud desde la perspectiva de los ciudadanos. Salamanca: Universidad de Salamanca; 2011 [cited 2016 Jun 21]. Available from: http://www.academia.edu/2865536/Evaluacion_del_proceso_de_descentralizacion_del_Sistema_Nacional_de_SaludDesde_la_perspectiva_de_los_ciudadanos
7. Sánchez Fernández A. La ley de cohesión y calidad del Sistema Nacional de Salud: nuevo intento de coordinación. Rev Adm Sanit. 2007;5(3):427-33.
8. Jefatura del Estado (ESP). Real Decreto-ley 16/2012, de 20 de abril, de medidas urgentes para garantizar la sostenibilidad del Sistema Nacional de Salud y mejorar la calidad y seguridad. Bol Oficial Estado. 24 abr 2012 [cited 2016 Jun 20]. Available from: https://www.boe.es/buscar/pdf/2012/BOE-A-2012-5403-consolidado.pdf
9. Repullo JR. Cambios de regulación y de gobierno de la sanidad. Informe SESPAS 2014. Gac Sanit. 2014;28 Suppl 1:62-8. https://doi.org/10.1016/j.gaceta.2014.03.008
10. Ministerio de Sanidad, Servicios Sociales e Igualdad (ESP). Subdirección General de Información Sanitaria e Innovación. Sistema de Información Sanitaria del Sistema Nacional de Salud. Madrid; 2014 [cited 2016 Jun 23]. Available from: http://www.msssi.gob.es/estadEstudios/estadisticas/sisInfSanSNS/pdf/SISNS.pdf
11. Ministerio de Sanidad, Servicios Sociales e Igualdad (ESP), Subdirección General de Información Sanitaria e Innovación. Indicadores Clave del Sistema Nacional de Salud (INCLASNS). Madrid; s.d. [cited 2016 Jun 21]. Available from: http://inclasns.msssi.es/main.html

12. Antunes JLF, Cardoso MRA. Uso da análise de séries temporais em estudos epidemiológicos. *Epidemiol Serv Salud*. 2015;24(3):565-76. https://doi.org/10.5123/S1679-49742015000300024

13. García Goñi M. Análisis descriptivo del gasto sanitario español: evolución, desglose, comparativa internacional y relación con la renta. Madrid: Instituto de Estudios Fiscales de la Universidad Complutense de Madrid; 2006 [cited 2016 Jun 25]. Available from: http://www.ief.es/documentos/recursos/publicaciones/papeles_trabajo/2006_24.pdf

14. Ahn N, Alonso Menseguer J, Herve San Miguel JA. Gasto sanitario y envejecimiento de la población en España. Madrid: Fundación BBVA; 2003 [cited 2016 Jun 26]. (Documentos de Trabajo, 7). Available from: http://www.fbbva.es/TLFU/dat/DT_2003_07.pdf

15. Julio V, Vacarezza M, Álvarez C, Sosa A. Niveles de atención, de prevención y atención primaria de la salud. *Arch Med Interna*. 2011 [cited 2016 Jun 27];33(1):11-4. Available from: http://www.scielo.edu.py/pdf/ami/v33n1/v33n1a03.pdf

16. Simó Miñana J. El gasto sanitario en España, 2002-2008: ¿empieza el rescate presupuestario de la atención primaria? *Aten Primaria*. 2011;44(1):20-9. https://doi.org/10.1016/j.aprim.2011.01.005

17. Clavero Barranquero A, González Álvarez ML. El envejecimiento como causa del incremento de gasto sanitario andaluces. Perspectiva de futuro. In: Anales de economía aplicada. Almería: Asociación Española de Economía Aplicada; 2003 [cited 2016 Jun 27]. Available from: https://dialnet.unirioja.es/servlet/articulo?codigo=848145

18. Manuél Cordero J, Nuño-Solínis R, Oruela JF, Polo C, Río-Cámara M, Alonso-Morán E. Evaluación de la eficiencia técnica de la atención primaria en el País Vasco, 2010-2013. *Gac Sanit*. 2016;30(2):104-9. https://doi.org/10.1016/j.gaceta.2015.11.002

19. Escuela Andaluza de Salud Pública. Junta de Andalucía (sede Web). Campus Universitario de Cartuja, Granada; 2016 [cited 2016 Jul 2]. Available from: http://www.easps.es/wp-content/uploads/documentos/EASP_EL%20futuro%20de%20los%20hospitales.pdf

20. Organización Mundial de la Salud. Informe sobre la salud en el mundo: la financiación de los sistemas de salud: el camino hacia la cobertura universal. Ginebra: OMS; 2010 [cited 2016 Jun 30]. Capítulo 4, Más salud por el dinero; p.67-94. Available from: http://www.who.int/whr/2010/10_chap04_es.pdf

21. Monge Jodrá V, Figuerola Tejerina MA, Pita López MJ, Gallego Berciano P, Robustillo Rodela A. Foro Sanidad y Derecho. Infecciones asociadas a la asistencia hospitalaria (HAIs). In: Infección hospitalaria. ¿Negligencia o complicación?; Sésion 11 de abril de 2013. Madrid: Hospital Universitario La Paz; 2013 [cited 2016 Jun 30]. Available from: http://www.madrid.org/cs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1352813965091&ssbinary=true

22. Zapatero Gavira A, Barba Martín R, Canora Lebrato JJ, Losa García JE, Plaza Canteli S, Marco Martínez J, et al. Mortalidad en los servicios de medicina interna. *Med Clin*. 2010;134(1):6-12. https://doi.org/10.1016/j.medcli.2009.04.050

23. López-Aguilera S, Goñi-Yeste M, Barrado L, González-Rodríguez-Salinas MC, Ortero JR, Chaves F. Colonización nasal por *Staphylococcus aureus* en estudiantes de medicina: importancia en la transmisión hospitalaria. *Enferm Infec Microbiol Clin*. 2013;31(8):500-5. https://doi.org/10.1016/j.eimc.2012.12.0055

24. Angulo-Pueyo E, Martínez-Lizaga N, Ruido-López M, García-Arresto S, Bernal-Delgado E. Evolución de las hospitalizaciones potencialmente evitables por condiciones crónicas en España. *Gac Sanit*. 2016;30(1):52-4. https://doi.org/10.1016/j.gaceta.2015.10.008

25. Ceballos-Acevedo TM, Velásquez-Restrepo PA, Jaén-Posada JS. Duración de la estancia media hospitalaria: metodologías para su intervención. *Gerenc Polit. Salud*. 2014;13(27):274-95. https://doi.org/10.11144/Javeriana.rgyps13-27.dehm

26. Federación de Asociaciones para la Defensa de la Sanidad Pública. Los servicios sanitarios de las CCAAs. Madrid; 2013 [cited 2016 Dec 9]. (Informe, 10). Available from: http://www.isifie.org/documentos/sccaa.pdf

27. Organización de Cooperación y Desarrollo Económico. Base de datos de la OCDE sobre la salud 2012: España en comparación. Paris; s.d. [cited 2016 Jun 27]. Available from: https://www.redaccionmedica.com/contenido/images/BriefingNoteESPAÑA2012inSpanish(1).pdf
28. Price Waterhouse Coopers. Diez temas candentes de la Sanidad Española para 2013: para que la crisis económica no se transforme en una crisis de salud pública. Madrid: PWC; 2012 [cited 2016 Jun 27]. Available from: https://www.pwc.es/es/publicaciones/sector-publico/assets/diez-temas-candentes-sanidad-2013.pdf

29. Llop-Gironés A, Tarafa G, Benach J. Personal de enfermería, condiciones de trabajo y su impacto en la salud. Gac Sanit. 2015;29(2):155-6. https://doi.org/10.1016/j.gaceta.2014.10.005

30. Legido-Quigley H, Karanikolos M, Hernandez-Plaza S, Freitas C, Bernardo L, Padilla B, et al. Effects of the financial crisis and Troika austerity measures on health and health care access in Portugal. Health Policy. 2016;120(7):833-9. https://doi.org/10.1016/j.healthpol.2016.04.009

31. Puig-Junoy J. ¿Más recursos para la salud? Barcelona: Elsevier-Masson; 2004.

32. Urbanos-Garrido R. La desigualdad en el acceso a las prestaciones sanitarias: propuestas para lograr la equidad. Gac Sanit. 2016;30 Suppl 1:25-30. https://doi.org/10.1016/j.gaceta.2016.01.012

Authors’ Contribution: Design and planning of the study: PR, VMGC. Collection, analysis, and interpretation of the data: KNM, VMGC. Preparation of the registry of the study: KNM, PR, VMGC. Approval of the final version: KNM, PR, VMGC. Public responsibility for the content of the article: KNM, PR, VMGC.

Conflict of Interest: The authors declare no conflict of interest.