



Original article

[Translated article] Analysis 2016–2021 of the development of the MAPEX outpatient pharmaceutical care Project by Regions in Spain

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ARTICLE INFO

Article history:

Received 5 June 2023

Accepted 21 August 2023

Available online 27 December 2023

Keywords:

Pharmaceutical care

Hospital pharmacy service

Outpatient

Health system

Patient satisfaction

Quality

A B S T R A C T

Objective: To analyse the evolution of the MAPEX Project (Strategic Map of Pharmaceutical Care for Outpatients) by regions in Spain, through the results of the comparative situation survey between 2016 and 2021.

Methods: A committee of national experts belonging to the Spanish Society of Hospital Pharmacy prepared the MAPEX Survey on the situation of Outpatient Units, which consisted of 43 specific questions on aspects related to structure, context, integration, processes, results and training, teaching, and investigation. It was carried out in 2 periods, one in 2016 and another in 2021 (with 3 additional questions in 2021, related to the progress of the MAPEX initiative and the priority lines to follow). A comparative analysis of results was carried out at the national level and by regions in Spain.

Results: 141 hospitals participated in 2016 and 138 in 2021, with representation from the 17 autonomous communities. The analysis of the results shows significant improvements in all the dimensions of the survey, with variability between the different regions. Among the most important improvements, the development and consolidation of telepharmacy stood out, the greater specialisation of pharmacists by areas of knowledge and their integration into multidisciplinary teams. The improvement of the healthcare model was considered the greatest advance at a general level (65%), and remote pharmaceutical care at the hospital level (48.2%). Priority lines of work were considered the expansion and practical application of the pharmaceutical care methodology (66.4%), research (58.4%), and training in all MAPEX initiatives (53.3%).

Conclusions: The implementation and development of the MAPEX initiatives has had a positive impact on the evolution in all healthcare areas of pharmaceutical care for outpatients. The situation survey makes it possible to identify by regions the significant points for improvement, as well as those areas to be developed through strengthening and corrective actions. The expansion of the project in the coming years will mean progress toward excellence in care and in the improvement of health results.

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Análisis 2016–2021 del desarrollo del Proyecto de atención farmacéutica al paciente externo MAPEX por Comunidades Autónomas en España

R E S U M E N

Palabras clave:

Atención Farmacéutica

Servicio de Farmacia Hospitalaria

Paciente Externo

Sistema de Salud

Objetivo: Analizar la evolución del Proyecto “Mapa Estratégico de Atención Farmacéutica al Paciente Externo” (MAPEX) por comunidades autónomas en España, a través del análisis de los resultados de la encuesta de situación comparativa entre los años 2016 y 2021.

Métodos: Un comité de expertos nacionales pertenecientes a la Sociedad Española de Farmacia Hospitalaria elaboró la Encuesta MAPEX sobre la situación de las Unidades de Pacientes Externos, que constó de 43

DOI of original article: <https://doi.org/10.1016/j.farma.2023.08.007>.

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<https://doi.org/10.1016/j.farma.2023.11.001>

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Satisfacción del paciente
Calidad

preguntas específicas de aspectos relacionados con estructura, contexto, integración, procesos, resultados y formación, docencia e investigación. Se llevó a cabo en dos periodos, uno en 2016 y otro en 2021 (con 3 preguntas adicionales en 2021, relacionadas con los avances de la iniciativa MAPEX y las líneas prioritarias a seguir). Se realizó un análisis comparativo de resultados a nivel nacional y por comunidad autónoma.

Resultados: Participaron 141 hospitales en 2016 y 138 en 2021, con representación de las 17 comunidades autónomas. El análisis de los resultados mostró mejoras significativas en todas las dimensiones de la encuesta, con variabilidad entre las diferentes regiones. De entre las mejoras más importantes, destacó el desarrollo y consolidación de la telefarmacia, la mayor especialización del farmacéutico por áreas de conocimiento y su integración en equipos multidisciplinares. La mejora del modelo asistencial se consideró el mayor avance a nivel general (65%), y la atención farmacéutica no presencial a nivel de centro (48,2%). Se consideraron líneas prioritarias de trabajo la expansión y aplicación práctica de la metodología de atención farmacéutica (66,4%), la investigación (58,4%) y la formación en todas las iniciativas MAPEX (53,3%).

Conclusiones: La implantación y desarrollo de las iniciativas MAPEX ha supuesto un impacto positivo en la evolución en todos los ámbitos asistenciales de la atención farmacéutica al paciente externo. La encuesta permite identificar por comunidades autónomas los puntos significativos de mejora y los aspectos a desarrollar a través de acciones de fortalecimiento y correctoras. La expansión del proyecto en los próximos años supondrá un avance hacia la excelencia de la atención y en la mejora de resultados en salud.

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Introduction

The social and economic implications of extended life expectancy are bringing about a qualitative shift in the patient profile. Patients now exhibit more co-morbidities, require complex treatments, and enjoy greater access to information. As a consequence, innovative approaches are emerging in healthcare.¹ Pharmaceutical care has evolved significantly since its origin in the late 1990s. The Ministry of Health implemented the PROSEREME-V programme in 1991 and, since then, Spanish hospitals are allowed to dispense medications to outpatients.² One of the enduring goals of this programme is to deliver patient-centred care while maintaining the sustainability of the health system.

However, over the last few decades, the healthcare landscape has evolved, presenting new challenges that require a response from hospital pharmacy services. Among the most relevant of these challenges are reducing healthcare variability, increasing authentic integration in multidisciplinary teams, and developing leadership roles in all aspects related to the increasingly complex pharmacotherapy of patients.

In response to these challenges, the Spanish Society of Hospital Pharmacy (SEFH) launched the Strategic Map of Pharmaceutical Care for Outpatients (MAPEX) project in 2014. The aim was to strengthen the framework of actions that would enable hospital pharmacists to anticipate the patients' needs.³

Since then, many different initiatives have been launched to provide hospital pharmacists with the tools needed to enhance their work. These initiatives include redefining and proposing a new pharmaceutical care model (known as CMO),⁴ developing stratification models and clinical practice guidelines for different diseases,⁵ laying the foundations for non-face-to-face pharmaceutical care (telepharmacy),⁶ and developing Q-PEX, a pioneering standard in the field of Hospital Pharmacy Outpatient Units (HPOUs) that certifies the quality of care provided to outpatients (OP).⁷

Scientific societies such as the American Society of Health-System Pharmacists (ASHP) and the European Association of Hospital Pharmacists (EAHP) have attempted to improve and unify hospital pharmaceutical care by creating frameworks for action and expanding HP training.^{8–10} However, none of these initiatives have the scope or as high a level of participation as the MAPEX project.

This study analysed the evolution of the Spanish MAPEX Project by Spanish Autonomous Region using the results of the Comparative Situation Survey between 2016 and 2021.

Methods

The MAPEX project was developed and implemented in 5 stages. The Survey on the Situation of Hospital Pharmacy Outpatient Units formed part of the third stage (Fig. 1).

The survey was developed by an expert committee comprising hospital pharmacists and advisors assigned to the MAPEX project, SEFH managers, and epidemiologists. The survey was developed in the following stages:

- Analysis of the situation (July 2015–May 2016). This phase involved identifying successful experiences and international recommendations based on a literature review and systematic analysis of information, as well as a review of the recommendations and quality standards developed by other scientific societies. Strategic lines to improve OP care were identified, encompassing various key areas in hospital pharmacy in general and professional development for hospital pharmacists.
- Definition of the concept, design, and development of the survey. This phase covered the literature search, review, and assessment, descriptive analysis, evaluation of OP satisfaction and experience questionnaires on pharmaceutical care, selection of practicable and valid indicators from the questionnaires and their adaptation to the Spanish setting, drafting the questionnaire items, grouping the items into 6 dimensions and strategic lines, and the creation of the questionnaire. The final version comprised 2 sections: (1) questions targeting the descriptive data of the hospital; and (2) 43 questions grouped into 6 dimensions or strategic lines (structure, context, integration, processes, results, and research), corresponding to the priority areas identified by the SEFH in 2020. The questionnaire included yes/no questions, multiple choice questions, and Likert scale questions. In 2021, 3 questions were added to the questionnaire: hospital pharmacists were asked for their opinions on the greatest overall advances of the MAPEX initiative, the most significant progress in their pharmacy services, and the priority lines most in need of further improvement.
- Validation of survey content and construct validity. The content was validated to ensure the questions were easily comprehensible, based on the judgement of the expert committee. The construct was validated by examining whether the proposed items established a unidimensional structure for the entire

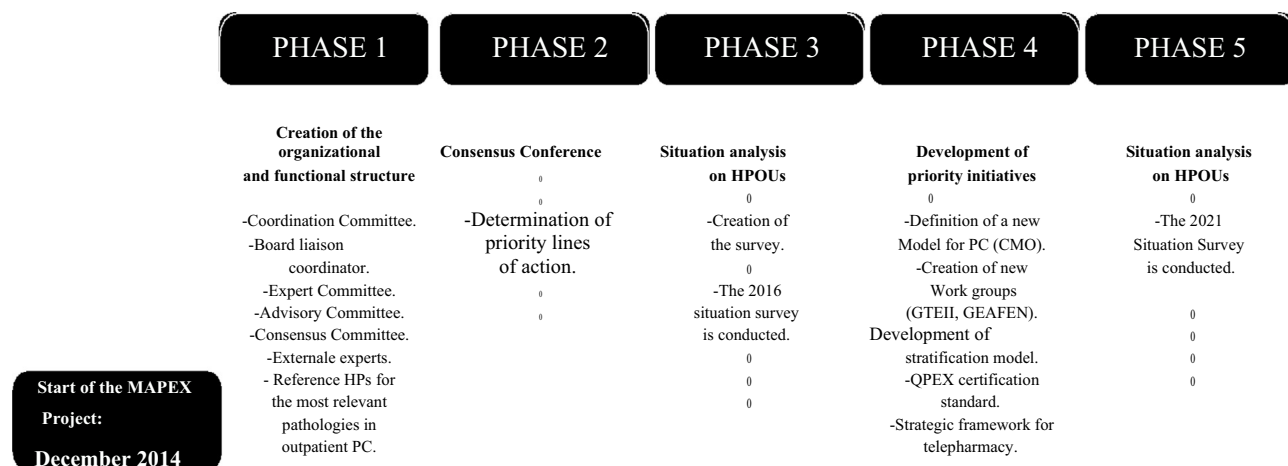


Fig. 1. Stages of the MAPEX project. Abbreviations: PC, pharmaceutical care; HPOU, hospital pharmacy outpatient units; HP, hospital pharmacy.

questionnaire, which could then be used to interpret the results of the survey across different hospitals. This analysis was conducted using factor analysis models specifically created to explain the common variance between items using as few factors as possible. This was accomplished by grouping or saturating related variables, or those expressing similar qualities, within the same factor or dimension.

The first survey was completed by pharmacy services in between March and April 2016, and the results were collected in June of the same year. Subsequently, a 4-year period was established for the development and implementation of the prioritised initiatives. This period was extended to 5 years due to the SARS-CoV-2 pandemic.

The second survey was completed by heads of pharmacy services or HPOU managers between September and November 2021 via the project's website.

A period of 2 months was assigned in which to complete the surveys. The web-based tool avoided duplication of information in case 2 individuals from the same centre completed the survey. In order to prevent partially completed surveys, the completion of the survey was made mandatory for closure.

We conducted a comparative analysis of the results for 2016 and 2021, at the national-level and by Autonomous Region.

In the statistical analysis, qualitative variables are expressed as means and standard deviations (%). Qualitative variables were analysed using contingency tables, the Chi-square test, or Fisher's exact test. The results are presented in the form of an analysis of the evolution of each Autonomous Region over the time period, of each Autonomous Region in relation to Spain as a whole, and in the form of a comparative analysis of progress at the national scale. A *P*-value of $< .05$ was used as a cut-off for statistical significance. All statistical analyses were conducted using SPSS v25.1.

Results

We surveyed 141 hospitals in 2016, and 138 hospitals in 2021. All 17 Autonomous Regions are represented in the sample (Annex 1).

Annex 2¹¹ contains the comparison of results between 2016 and 2021, both at the national level and by Autonomous Region. The analysis of the national results shows improvements in all dimensions of the survey. We observed significant advances in the following areas: (1) the availability of recommendations to guarantee adequate coverage (from 100% in Cantabria and Navarra to 67% in Aragón and the Balearic Islands; $P < .05$); (2) the availability of defined criteria for the

allocation of time and the distribution of healthcare workload (from 100% in Aragón and Extremadura to 35% in the Autonomous Community of Valencia; $P < .05$); (3) the integration of pharmacists in multidisciplinary teams (the presence of pharmacists in 4 or more clinical services in all Autonomous Regions; $P < .05$); (4) the integration of the patients' medication history with the hospitals' prescription drug dispensing process (from 100% in Cantabria, Galicia, Navarra, and the Basque Country to 33% in Extremadura; $P < .05$); (5) the standardisation of the recording of mainly medication and/or adherence interventions ($P < .05$) and in the use of electronic health records and dispensing records to record pharmaceutical interventions (implemented in all the Autonomous Regions except Cantabria; $P < .05$); and (6) in the incorporation of appointment management systems (established in 15 Autonomous Regions; $\geq 75\%$, $P < .05$). Significant improvements were also observed a number of other areas: (1) the implementation of joint initiatives with scientific societies other than the SEFH ($P < .05$), notably in the Balearic Islands (67%); (2) participation in activities external to pharmacy services ($P < .05$), particularly in the development of strategies for the acquisition of innovative medicines, especially in Navarra (100% participation); (3) the expansion of continuous pharmaceutical care ($P < .05$); (4) the implementation of telepharmacy services (100% participation in the Balearic Islands and Cantabria; $P < .05$); (5) in specialisation by clinical area ($\geq 50\%$ implementation in 13 Autonomous Regions; $P < .05$); (6) participation in multicentre research ($P < .05$); and (7) measurement of patient-reported outcomes (ranging from 67% in Extremadura to 0% in Aragón, Asturias, and Cantabria; $P < .05$).

Annex 3 includes the responses to the additional questions included in the 2021 survey.

Discussion

Between 2016 and 2021, the MAPEX Project, through a number of initiatives, significantly improved outpatient pharmaceutical care across all the Spanish Autonomous Regions.

The MAPEX Project arose in response to the need for change in the traditional healthcare model motivated by the challenge of ensuring the sustainability of the healthcare system, given extended life expectancy, the growing prevalence of chronic diseases, the increasing complexity of treatments, and the need to adapt to the impact of the digital revolution on patients' access to information.¹² Likewise, due to the increasing volume of patients served in HPOUs, strategies have to be developed to improve the efficiency of pharmacy services and ensure quality pharmaceutical care.¹³ In this setting, MAPEX has played a key

role in reinforcing the framework of actions that enable hospital pharmacists to anticipate patients' needs and develop better OP care. Although other professional pharmaceutical organisations have developed similar projects in the field of HPOUs,^{8–10} MAPEX is a first to cover all the dimensions of OP care: context, integration, processes, outcomes, research, and teaching.

The starting point for this new framework for action was the CMO Model in Hospital Pharmacy Outpatient Consultations, published in 2016. The model is based on multidisciplinary and patient-centred care, excellence in knowledge, and evaluation of results.¹⁴ Among the surveyed pharmacy services across all the Autonomous Regions, the CMO model was the most highly regarded aspect of the overall progress achieved by the MAPEX Project, possibly due to its contribution to strengthening the professional activity of hospital pharmacists and its adaptation to different diseases.^{15,16} The results of the survey show that there has been a significant improvement in the integration of pharmacists in multidisciplinary teams; pharmacists are present in 4 or more clinical services across all Autonomous Regions. Specialisation by clinical area has also improved ($\geq 50\%$ implementation in 13 Autonomous Regions); Aragón, the Balearic Islands and Cantabria are particularly successful examples. Although there is ample evidence of the benefits of integration and specialisation,^{17,18} more than 50% of pharmacy services across all the Autonomous Regions report that the responsibilities of specialist pharmacists in the teams in which they participate have not yet been defined. This aspect is addressed in the MAPEX document "Model for Continuous Improvement of Specialist Pharmacist Integration in Healthcare Teams".¹⁹

There was a positive overall trend in the measurement of patient-reported outcomes, although there were a large variations between Autonomous Regions (from 67% in Extremadura to 0% in Aragón, Asturias, or Cantabria). These variations may be due to difficulties in its implementation in everyday routines, including the lack of specific resources and time, the healthcare burden, difficulties in interpreting results,^{20,21} and the need to develop technological tools that would facilitate its implementation and analysis.²² Indeed, the results show that most of the Autonomous Regions do not have sufficient resources for health outcomes research and that there has been no progress in this area in the last 5 years.

Furthermore, the analysis of MAPEX's progress identified 3 other crucial elements that demand attention to enhance healthcare delivery: certification of the HPOU, patient stratification, and telepharmacy. Regarding certification, August 2021 saw the publication of the Q-PEX standard,²³ which provides guidelines and standardising criteria in the areas of care, teaching, and research. In total, 41% of the surveyed pharmacy services regarded the implementation of this certification over the next few years as a high priority. Stratification models are incorporated in the MAPEX project to respond to the individualised care needs of patients based on their unique characteristics. The results show that they have been significantly integrated into healthcare practice in Autonomous Regions such as the Balearic Islands, Castilla la Mancha, Catalonia, Madrid, Navarre, and the Valencian Community. On the other hand, in 10 Autonomous Regions, less than 35% of the pharmacy services surveyed apply stratification models, which may be due to factors such as the lack of human resources or the volume of the workload. More than 50% of all Autonomous Regions have defined criteria for the allocation of time and the distribution of the healthcare workload and use appointment systems—with notable progress in Aragón, Castilla la Mancha, Castilla León, Extremadura, and Navarra—and keep records of pharmaceutical interventions, which will aid progress in the incorporation of these models in the healthcare system.

The MAPEX project also encourages a high degree of commitment toward fulfilling therapeutic goals, even when patients are

physically absent. Thus, the use of technology is emphasised, opening the door to the introduction of telepharmacy as a tool to promote continuous, comprehensive, multidisciplinary, and quality care. The survey shows that most pharmaceutical care continues to be delivered on demand, at the start of treatment, or when it changes. However, in recent years, we have seen a significant trend toward continuous pharmaceutical care. Telepharmacy programmes have been implemented in all Autonomous Regions, with some pharmacy services achieving over 80% implementation, such as in the Balearic Islands, Cantabria, and the Valencian Community. Although part of this progress was clearly driven by the emergency situation caused by the SARS-CoV-2 pandemic, it was consolidated with the publication of the Strategic Framework for Telepharmacy²⁴ and the Methodological Documents for the Expansion of Telepharmacy.²⁵ Among the pharmacy services surveyed across all Autonomous Regions, the creation and development of these initiatives were the most highly regarded aspect. Given the urgency of the situation at that time, telephone and e-mail were, and still are, the main means of teleconsultation in all the Autonomous Regions. The results highlight the need to investment in developing telemonitoring tools (wearables, apps) and training in their use. These tools are well-suited to tech-savvy patients and will be used monitor and record telemetry data obtained from the patients. In this regard, there has been noteworthy progress in the Balearic Islands, where 100% of hospitals have websites or apps.

The ASHP and EAHF recommendations for the 2030 horizon aim to foster initiatives that advance a human-centred and patient-centric care model. These initiatives are based on the principles of evidence-based medicine, professional training, technological evolution, and the measurement of health outcomes.^{26,27} Over several years, the SEFH has been developing these lines of work via the MAPEX initiatives and now holds an outstanding position in the field of OP healthcare. The Q-PEX certification standard further promotes progress in this direction.

This study has some limitations. Firstly, the 2016 and 2021 surveys may not have been completed by the same individuals, possibly due to changes in staffing and typical job mobility within the sector. To minimise this variability, we asked that the survey always be completed by the head of service or the person in charge of the HPOU. Nevertheless, only half of the participating pharmacy services completed the survey in both time periods. Furthermore, some improvements attributable to the project may also stem from the sector's natural evolution over time, improved IT infrastructure, or broader global issues, such as the SARS-CoV-2 pandemic. Finally, the lack of other similar international projects meant that decisions had to be taken through expert consensus.

One of the strengths of the study is that 22% of all Spanish hospitals responded to the surveys.²⁸ Thus, all 17 Autonomous Regions are represented with their unique characteristics, allowing us to extrapolate the results to the national-level.

Future lines of research will enable us to create a roadmap that supports collaborative efforts, helps us overcome obstacles, and guides us on a path toward achieving excellence in pharmaceutical care. The survey has identified several priority areas for future development: (1) expanding and applying pharmaceutical care methodology in practice; (2) emphasising research, innovation, and the generation of evidence and practical results; and (3) enhancing staff training and capacity-building across all MAPEX initiatives.

This analysis identifies significant areas for improvement and development by Autonomous Region. In turn, this will help us pinpoint the necessary strengthening and corrective actions for the upcoming years.

Contribution to the scientific literature

This study describes the implementation and development of the Strategic Map for Outpatient Pharmaceutical Care (MAPEX) project. It provides a comparative analysis of the data obtained from over 130 hospitals via 2 surveys conducted in 2016 and 2021 at the national-level and by Autonomous Community. The surveys measured aspects of the different dimensions of outpatient pharmaceutical care.

The analysis facilitates the identification of significant areas for improvement and development by Autonomous Region, and assists in defining strategic lines for the improvement of the quality of outpatient care.

Ethical responsibilities

All authors fulfilled their ethical responsibilities.

Funding

None declared.

Statement of authorship

All authors contributed to the concept, design, definition of intellectual content, literature review, data collection and analysis, and review of the manuscript, and accept full responsibility for this paper.

Esther Vicente-Escrig and Pilar Taberner Bonastre also contributed to preparing and editing the manuscript.

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Declaration of Competing Interest

The authors declare no work-related, research, financial, or ethical conflicts of interest.

Acknowledgements

We would like to thank all the participants of the MAPEX-SEFH project for their contribution, the SEFH Board of Directors and Governing Boards for their support of the project since its inception, and all the hospitals participating in the MAPEX Survey on the Situation of Hospital Pharmacy Outpatient Units (see Appendix 1).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.farma.2023.11.001>.

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