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## Original Article

### Usefulness of rheumatology consultancy in situ: Analysis of a long-term experience<sup>☆</sup>



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#### ABSTRACT

**Objective:** To report the long-term experience of a rheumatologist consultant “in situ” (RCI) in a primary care centre (PCC).

**Material and methods:** Observational retrospective study analysing the complete cohort of the patients seen by the RCI between 2013 and 2019. Rheumatology patients’ clinical characteristics and course of care were collected to estimate the diagnoses that were most likely to be monitored by a primary care physician (PCP).

**Results:** A total of 876 consultations were attended; 205 were men (23.4%) and 671 women (76.6%). Most of the consultations (280, 33.2%) were diagnostic. On 167 occasions (19.8%) therapeutic issues were analysed; in 47 (5.6%) therapeutic infiltrations were performed. Chronic patient control was applied in 163 subjects (19.3%). A request for tests not available to the PCP was the reason for the consultation in 154 situations (18.3%). The profile most likely to continue being monitored in the PCC is the patient with osteoarthritis (OR = .13, 95% CI: .02–.67), soft tissue rheumatism (OR = .006, 95% CI: .01–.45) or cervical disc herniation (OR = .13, 95% CI: .02–.66). Less likely to be monitored by PCP after being seen by the RCI were subjects with rheumatoid arthritis (OR = .03, 95% CI: .00–.24), other inflammatory arthropathies (OR = .36, 95% CI: .16–.80) or with polymyalgia rheumatica (OR = .19, 95% CI: .06–.64), and those in need of chronic disease monitoring (OR = .16, 95% CI: .07–.34).

**Conclusions:** The RCI makes it easier for the PCP to monitor patients with osteoarthritis, soft tissue rheumatism and cervical disc pathology.

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### Utilidad de la consultoría reumatológica *in situ*: análisis de una experiencia prolongada en el tiempo

#### RESUMEN

**Objetivo:** Estudiar la utilidad a largo plazo de un reumatólogo consultor “in situ” (RCI) en un centro de Salud (CS).

**Material y métodos:** Estudio observacional retrospectivo sobre la cohorte completa de pacientes atendidos entre 2013 y 2019, analizando variables clínicas y de curso asistencial, intentando perfilar qué diagnósticos de los pacientes reumáticos tenían más probabilidades de continuar su atención en el CS por el médico de Atención Primaria (MAP).

##### Palabras clave:

Reumatólogo consultor

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**Resultados:** Se atendieron 876 consultas; 205 (23,4%), varones y 671 (76,6%), mujeres; edad media: 64,1 años (DE = 16,6). La mayoría de las consultas (280, 33,2%) fueron diagnósticas. En 167 ocasiones (19,8%) se abordaron temas terapéuticos; en 47 (5,6%) se realizaron infiltraciones. La petición de pruebas no disponibles para el MAP se verificó en 154 situaciones (18,3%). El perfil de paciente con más opciones de continuar su seguimiento por el MAP en el CS es el portador de artrosis (OR = 0,13, IC 95%: 0,02–0,67), reumatismo de partes blandas (OR = 0,06, IC 95%: 0,01–0,45) o hernia discal cervical (OR = 0,13, IC 95%: 0,02–0,66). Los pacientes con menos probabilidades de seguimiento por MAP tras su paso por RCI son los portadores de artritis reumatoide (OR = 0,03, IC 95%: 0,00–0,24), otras artropatías inflamatorias (OR = 0,36, CI 95%: 0,16–0,80) o con polimialgia reumática (OR = 0,19, IC 95%: 0,06–0,64); también los que necesitan de control de enfermo crónico (OR = 0,16, IC 95%: 0,07–0,34).

**Conclusiones:** El RCI facilita el seguimiento por el MAP de la artrosis, reumatismos de partes blandas y de la dicopatía cervical; le permite disponer de determinadas pruebas complementarias para el diagnóstico.

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## Introduction

The prevalence of rheumatic diseases in the general population is high.<sup>1</sup> Some authors state that 40% of the population may suffer from some form of rheumatic pain over the course of a year. This results in very high uptake of health services by this type of patient and considerable impact on primary care. Similarly, access and communication with specialist consultations for both rheumatic patients and primary care physicians (PCP) is not always easy, given their often distant location and potential delay.<sup>2,3</sup>

The role of the rheumatologist consultant in situ was created in our health setting to bring together levels of care for the benefit of rheumatic patients, as a permanent link between the PCP and specialist care. The aim of this study is to report the experience in implementing this care system long term and to analyse its potential yield and benefits.

## Material and methods

The aim of the present study was to examine the long-term usefulness of an RCI in a health centre (HC) and identify the types of rheumatic diseases that could especially benefit from this care system.

We designed a retrospective observational study in which we analysed the entire cohort of patients attended by the RCI during the period from August 2013 to December 2019 at the Cervantes health centre in Guadalajara (Castilla-La Mancha, Spain). This HC comprises a team of 6 family doctors with a population of 8,301 with public health insurance cards under their care (SESCAM, January 2020). The RCI (JTM) was part of the Rheumatology Unit of the Hospital General Universitario de Guadalajara.

The patient variables collected were sex, age, date of consultation and number of consultations. The reason for the consultation was identified by defining the following categories: a) diagnostic consultation for assessment of suspected diagnosis; b) patient treatment visit for assessment of therapeutic aspects; c) infiltration: consultation exclusively for infiltration; d) request for tests: assessment of test requests together with the rheumatologist, especially for those not accessible to PCPs; e) chronic patient monitoring: follow-up of patients with chronic disease; f) visit for reports: orthopaedic or disability prescriptions; and g) no record: cases for which the reason for consultation was not established.

We classified the diagnoses into the following groups: (a) peripheral osteoarthritis, (b) osteoarthritis of the spine, (c) soft tissue rheumatism, (d) cervical disc pain/herniation, (e) lumbar disc pain/herniation, (f) carpal tunnel syndrome, (g) rheumatoid arthritis, (h) other inflammatory arthropathies, (i) polymyalgia rheumatica/temporal arthritis, (j) osteoporosis, (k) fibromyalgia and (l) other diagnoses.

We analysed the following complementary tests requested by the RCI at each visit. These could include a) plain X-ray, b) densitometry, c) magnetic resonance imaging, d) computed tomography, e) electromyography and f) none.

Finally, the following possibilities for monitoring the patient's course of care were established: a) discharge, b) follow-up by the PCP without further follow-up by rheumatology, c) follow-up by the RCI in successive visits to the HC, d) transfer to follow-up by hospital rheumatology, e) referral to traumatology, f) referral to rehabilitation, g) referral to physiotherapy and h) referral to other specialties.

The study was authorised by our health area's Medicines Research Ethics Committee (reference CEIm: 2020.02.PR). The data were obtained using the Turriano healthcare programme (software used to manage PCP medical records). All the information was anonymised and processed in accordance with current data protection regulations. A descriptive analysis of the variables was performed, obtaining the frequencies and percentages of the categories. Different multivariate logistic regression models were calculated to estimate the diagnoses of rheumatic patients that were less likely to be followed up by the PCP in the HC.

## Results

Over the period 1 August 2013 to 31 December 2019 the RCI had a total of 876 patient consultations, 205 were male (23.4%) and 671 female (76.6%). The average age of the population seen was 64.1 years (SD = 16.6). An average of 4 consultations with the consultant per patient (SD = 5.8) were verified. Most of the consultations (280; 33.2%) were diagnostic. Issues related to patient management were addressed on 167 occasions (19.8%); in 47 (5.6%) therapeutic infiltrations were performed. The system was used for chronic patient monitoring 163 times (19.3%). A request for tests not available to the PCP was the reason for consultation in 154 situations (18.3%). The remaining consultations were to issue reports and other unquantified tasks (Table 1).

In most cases (450; 63.8%) no complementary tests were requested. When the RCI needed to request a complementary test, bone densitometry (101; 14.3%) was the first in order of frequency, followed by MRI (70; 9.9%), plain X-ray (45; 6.4%), electromyography (26; 3.7%) and computed tomography (13; 1.8%). The entities treated most frequently in the rheumatology consultation (in decreasing order of frequency) were: (a) osteoporosis (166 consultations; 19.6%), (b) rheumatoid arthritis and other inflammatory arthropathies (159; 18.8%), (c) cervical/lumbar disc herniation (106; 12.5%), (d) polymyalgia rheumatica (100; 11.8%), (e) soft tissue rheumatism (83; 9.8%), (f) peripheral osteoarthritis (74; 8.8%), (g) osteoarthritis of the spine (28; 3.3%) and (h) carpal tunnel syndrome (18; 2.1%). Fibromyalgia was the reason for consultation on 6 occasions (.7%).

**Table 1**  
Main results of the analysis of the usefulness of rheumatology consultancy in situ: a descriptive study.

| Variable                          | n           | %          |
|-----------------------------------|-------------|------------|
| <i>Sex</i>                        |             |            |
| Female                            | 671         | 76.6       |
| Male                              | 205         | 23.4       |
| Total                             | 876         | 100.0      |
| <i>Diagnosis</i>                  |             |            |
| Osteoporosis                      | 166         | 19.6       |
| Other                             | 105         | 12.4       |
| Polymyalgia rheumatica            | 100         | 11.8       |
| Lumbar disc pain/herniation       | 88          | 10.4       |
| Other inflammatory arthropathies  | 87          | 10.3       |
| Soft tissue rheumatism            | 83          | 9.8        |
| Peripheral osteoarthritis         | 74          | 8.8        |
| Rheumatoid arthritis              | 72          | 8.5        |
| Osteoarthritis of the spine       | 28          | 3.3        |
| Cervical disc pain/herniation     | 18          | 2.1        |
| Carpal tunnel syndrome            | 18          | 2.1        |
| Fibromyalgia                      | 6           | .7         |
| Total                             | 845         | 100.0      |
| <i>Type of consultation</i>       |             |            |
| Diagnostic consultation           | 280         | 33.2       |
| Patient's treatment               | 167         | 19.8       |
| Chronic patient                   | 163         | 19.3       |
| Request for tests                 | 154         | 18.3       |
| Infiltration                      | 47          | 5.6        |
| No record                         | 31          | 3.7        |
| Reports                           | 2           | .2         |
| Total                             | 844         | 100.0      |
| <i>Complementary tests</i>        |             |            |
| None                              | 450         | 63.8       |
| Bone densitometry                 | 101         | 14.3       |
| Magnetic resonance                | 70          | 9.9        |
| Plain X-ray                       | 45          | 6.4        |
| Electromyography                  | 26          | 3.7        |
| Computerised tomography           | 13          | 1.8        |
| Total                             | 705         | 100.0      |
| <i>Patient destination</i>        |             |            |
| Follow-up by rheumatologist in HC | 369         | 43.7       |
| Follow-up by PCP                  | 341         | 40.4       |
| Discharge                         | 61          | 7.2        |
| Hospital rheumatology ICR         | 32          | 3.8        |
| Trauma ICR                        | 24          | 2.8        |
| Rehabilitation ICR                | 7           | .8         |
| Physiotherapy ICR                 | 6           | .7         |
| Other specialty ICR               | 4           | .4         |
| Total                             | 844         | 100.0      |
| Mean age (SD) median [IQR]        | 64.1 (16.6) | 54 [66–77] |
| Number of consultations           | 4.0 (5.8)   | 1 [1–4]    |

HC: health centre; ICR: interconsultation report; IQR: interquartile range; PCP: primary care physician; IQR: interquartile range; SD: standard deviation.

Regarding the destination and course of care of the rheumatic patients, after they had been reassessed jointly by the RCI and the PCP in the HC (Table 1), most of the subjects were sent for follow-up by the PCP (341 individuals; 40.4%), or by the RCI in the HC itself (369 patients; 43.7%). Sixty-one patients (7.2%) were discharged from medical follow-up and only on 63 occasions were subjects referred for hospital consultation (32 to rheumatology, 24 to trauma and 7 to rehabilitation).

Table 2 shows, according to a multivariate adjusted model, the odds ratio of the rheumatic patients attended by the RCI of continuing follow-up with the PCP (reference variable) compared to the rest of the destinations analysed. Subjects with rheumatoid arthritis and other inflammatory arthropathies and polymyalgia rheumatica are less likely to continue their exclusive follow-up with the PCP after being assessed by the RCI, with ORs of .03 (95% CI .00–.24), .36 (95% CI .16–.80) and .19 (95% CI .06–.64), respectively. The same occurs when the HC consultation in situ is to order tests or

to follow up a chronic patient. In terms of the type of test requested, when a neurophysiological study was indicated, the likelihood that the subject would continue to be seen by their PCP significantly decreased.

Table 3 shows the investigation of the patient's odds ratio (OR) of continuing to receive follow-up care at the HC with their usual PCP versus being seen by the rheumatology speciality (RCI or hospital consultation). This adjusted multivariate analysis confirms that patients who are older, with inflammatory joint disease, with chronic disorders, who require tests that are difficult to interpret or who are under special treatments are more likely to require follow-up by specialist rheumatology care.

Finally, if we analyse (Table 4) the odds ratio that the patient seen under the system would continue their course of care in the specialty of rheumatology (compared to the other options analysed, both in the consultation in situ and in the hospital setting), osteoarthritis, soft tissue rheumatism or cervical disc herniation are the patient profiles with the fewest options, with an OR of .13 (95% CI: .02–.67); .06 (95% CI: .01–.45) and .13 (95% CI: .02–.66), respectively.

## Discussion

In our HC, implementing the rheumatology consultant in situ system has enabled more than 90% of the rheumatological diseases treated at this level of care to be resolved. We demonstrate in this study that the RCI is particularly useful in the care of patients with osteoarthritis, soft tissue rheumatism and cervical disc disease, in the HC and by the PCP. In addition, as a particular feature of our experience, we detected an added value in facilitating and expediting specialist care (even by the RCI in the HC itself) of patients with rheumatoid arthritis, other inflammatory arthropathies or polymyalgia rheumatica. This was also useful in requesting certain complementary diagnostic tests that the PCPs in our health area are not allowed to request.

In addition to the abovementioned advantages, this healthcare instrument reduces the impact of care on the hospital and affords greater comfort to rheumatic patients who have disability and travel difficulties. Furthermore, although not analysed in this study, the system improves continuity of care and coordination between levels and contributes to updating and continuous medical training in locomotor disorders. Valuable feedback is also provided by enhancing the strengths of both specialties, family medicine and rheumatology.

Many authors<sup>4–7</sup> endorse the usefulness of this healthcare system, which we have validated in this study. They believe that there are further advantages in addition to those already mentioned, which include encouraging teamwork, increasing the effectiveness of the specialist's intervention in the first consultation with the patient, avoiding unnecessary tests and treatments, and helping to promptly identify subjects who require rapid consultation with specialist care.

Despite extensive efforts,<sup>8,9</sup> there is a gap in our healthcare system between levels of care that hinders and delays access to specialist care for patients with rheumatic disease, especially in cases of inflammatory or systemic disease, or who need access to sophisticated technological tests or complex treatments. Many solutions have been proposed,<sup>10–12</sup> including rapid diagnostic consultations, links between units and many other experiences, most of which are implemented in the hospital setting. Experiences such as the current one are rare, in which the same senior specialist regularly visits on a continuous basis over time, and with a well-developed and perfected model, the same HC where, in turn, there is a stable PCP team. There is no doubt that these 2 human factors contribute to the success of the experience, and as demonstrated, make it effi-

**Table 2**

Odds ratio of rheumatic patients attended at the health centre consultancy of continuing follow-up by the primary care physician compared to other care destinations (multivariate adjusted model).

|   | OR   | 95% CI       | p     |
|---|------|--------------|-------|
| <i>Sex</i>  |      |              |       |
| Female (ref. male)  | 1.58 | (1.03–2.41)  | .036  |
| Age   | .98  | (.97–.99)    | .003  |
| <i>Diagnosis (reference peripheral osteoarthritis)</i>          |      |              |       |
| Osteoarthritis of the spine                                     | 1.31 | (.46–3.71)   | .616  |
| Soft tissue rheumatism  | .99  | (.43–2.30)   | .984  |
| Cervical disc pain/herniation                                   | .85  | (.23–3.16)   | .808  |
| Lumbar disc pain/ herniation                                    | .83  | (.36–1.92)   | .667  |
| Carpal tunnel syndrome  | .16  | (.02–1.13)   | .066  |
| Rheumatoid arthritis  | .03  | (.00–.24)    | .001  |
| Other inflammatory arthropathies                                | .36  | (.16–.80)    | .012  |
| Polymyalgia rheumatica  | .19  | (.06–.64)    | .007  |
| Osteoporosis  | .76  | (.37–1.58)   | .466  |
| Fibromyalgia  | 1.07 | (.16–7.07)   | .946  |
| <i>Type of consultation (reference diagnostic consultation)</i> |      |              |       |
| Patient treatment   | .65  | (.36–1.17)   | .150  |
| Infiltration  | 1.39 | (.59–3.27)   | .454  |
| Request for tests   | 3.12 | (1.47–6.61)  | .003  |
| Chronic patient   | .16  | (.07–.34)    | <.001 |
| <i>Tests (reference plain X-ray)</i>                            |      |              |       |
| Bone densitometry   | .75  | (.25–2.22)   | .602  |
| Magnetic resonance  | 1.04 | (.42–2.58)   | .941  |
| Computerised tomography   | 4.60 | (.91–23.36)  | .066  |
| Electromyography  | 5.65 | (1.02–31.15) | .047  |

**Table 3**

Odds ratio of rheumatic patients attended at the health centre consultancy of continuing follow-up by the primary care physician versus follow-up in rheumatology specialty (multivariate adjusted model).

|   | OR   | 95% CI      | p     |
|---|------|-------------|-------|
| <i>Sex</i>  |      |             |       |
| Female (reference male)   | 1.53 | (.92–2.54)  | .100  |
| Age   | .98  | (.96–1.00)  | .010  |
| <i>Diagnosis (reference peripheral osteoarthritis)</i>          |      |             |       |
| Osteoarthritis of the spine                                     | 1.20 | (.35–4.15)  | .778  |
| Soft tissue rheumatism  | 2.94 | (.96–8.98)  | .059  |
| Cervical disc pain/herniation                                   | 4.34 | (.43–43.79) | .213  |
| Lumbar disc pain/herniation                                     | 1.50 | (.53–4.24)  | .447  |
| Carpal tunnel syndrome  | .26  | (.04–1.86)  | .179  |
| Rheumatoid arthritis  | .02  | (.00–.16)   | .000  |
| Other inflammatory arthropathies                                | .32  | (.13–0.78)  | .012  |
| Polymyalgia rheumatica/temporal arteritis                       | .14  | (.04–.48)   | .002  |
| Osteoporosis  | .59  | (.26–1.33)  | .206  |
| Fibromyalgia  | .64  | (.09–4.69)  | .660  |
| Other   | 1.22 | (.46–3.24)  | .690  |
| <i>Type of consultation (reference diagnostic consultation)</i> |      |             |       |
| Patient treatment   | .37  | (.18–.73)   | .005  |
| Infiltration  | 1.13 | (.33–3.84)  | .846  |
| Request for tests   | 3.37 | (1.40–8.09) | .007  |
| Chronic patient   | .08  | (.04–.20)   | .000  |
| <i>Tests (reference plain X-ray)</i>                            |      |             |       |
| Bone densitometry   | 1.00 | (.29–3.48)  | 1.000 |
| Magnetic resonance  | .99  | (.35–2.85)  | .992  |
| Computerised tomography   | 3.15 | (.55–18.13) | .199  |
| Electromyography  | 3.55 | (.58–21.81) | .171  |

cient with a high degree of patient satisfaction (high in 20% and very high in 80%, according to a previous unpublished study).

Esteban Giner et al.<sup>13</sup> analysed the efficacy over its first year of a consultation linking internal medicine and primary care in the area of Alcoy (Alicante). They demonstrated low consumption of resources with a significant reduction in referrals, without increasing the cost for the system (which was also our experience). We both used pre-existing personnel and material resources, which increases the efficiency of the model. The patient profile that benefited from these connecting consultations coincides in many respects with that of our study: multimorbid, multimedicated, with highly diverse and heterogeneous reasons for consultation, com-

plementary examinations to assess, and diagnoses. Other authors<sup>14</sup> have shown that with a consultancy care mechanism they are able to resolve 40% of the consultations requested by the PCP in a single visit.

Trujillo et al.<sup>15</sup> studied the cost-effectiveness of a rheumatology-primary care consultancy unit. Only 3.2% of the patients seen were referred to the hospital rheumatology service. Osteoarthritis, soft tissue rheumatism and rickets are the most frequent diagnoses. According to this group's data, newly diagnosed cases of inflammatory arthropathy are less frequent.

Another Spanish group<sup>16</sup> studied the appropriateness of referrals from primary care to hospital medical specialties by analysing

**Table 4**

Odds ratio of rheumatic patients attended at the health centre consultancy of continuing follow-up in the specialty of rheumatology versus the other care destinations analysed (multivariate adjusted model).

|   | OR   | 95% CI      | p    |
|---|------|-------------|------|
| <i>Sex</i>  |      |             |      |
| Female (reference. male)  | 1.55 | (.82–2.93)  | .177 |
| Age   | .98  | (.96–1.00)  | .036 |
| <i>Diagnosis (reference peripheral osteoarthritis)</i>          |      |             |      |
| Osteoarthritis of the spine                                     | .13  | (.02–.67)   | .015 |
| Soft tissue rheumatism  | .06  | (.01–.45)   | .006 |
| Cervical disc pain/ herniation                                  | .13  | (.02–.66)   | .014 |
| Lumbar disc pain/ herniation                                    | 1.00 |             |      |
| Carpal tunnel syndrome  | .32  | (.05–1.96)  | .217 |
| Rheumatoid arthritis  | .27  | (.05–1.37)  | .113 |
| Other inflammatory arthropathies                                | 2.07 | (.17–24.99) | .566 |
| Polymyalgia rheumatica  | 1.30 | (.19–9.11)  | .792 |
| Osteoporosis  | 1.00 |             |      |
| Fibromyalgia  | .21  | (.04–1.04)  | .056 |
| <i>Type of consultation (reference diagnostic consultation)</i> |      |             |      |
| Patient treatment   | 2.12 | (.76–5.93)  | .152 |
| Infiltration  | 3.59 | (.86–14.95) | .079 |
| Request for tests   | 2.70 | (.74–9.79)  | .131 |
| Chronic patient   | 2.63 | (.90–7.70)  | .079 |
| Reports   | 1.00 |             |      |
| No record   | 1.00 |             |      |
| <i>Tests (reference plain X-ray)</i>                            |      |             |      |
| Bone densitometry   | .98  | (.11–8.39)  | .986 |
| Magnetic resonance  | .85  | (.22–3.26)  | .818 |
| Computerised tomography   | 1.00 |             |      |
| Electromyography  | 1.00 |             |      |
| None  | .66  | (.22–2.00)  | .464 |

their characteristics from the perspective of the 2 parties involved. They investigated 225 randomly selected patients. The results of this study show that a high percentage of referrals from primary care to hospital medical specialties are considered inappropriate or unnecessary: 26% when the agreement of all 4 observers was required and 37% when only 3 of the 4 investigators were required to agree. Streamlining the healthcare system should allow the diagnosis and treatment of patients according to their needs at the most appropriate level of care, avoiding inappropriate use of other services.

As seen in the present study, bringing the rheumatology specialist closer to the PCP, and facilitating rheumatic patients' access to the specialist in an outpatient setting avoids inappropriate referrals to other locomotor specialties. Our analysis is retrospective and could have been completed with a parallel study of rheumatic patient behaviour and referral rates in other HCs in our setting without the RCI, to compare the results obtained with both care designs. Nevertheless, other studies like ours confirm our findings.<sup>17,18</sup>

A study conducted in 1998<sup>19</sup> in an outpatient trauma clinic showed that only 36.1% of the individuals seen were diagnosed with an orthopaedic or trauma disease, the rest were rheumatological diseases. Furthermore, studies in other countries<sup>20</sup> show a very significant reduction in costs when the non-surgical specialist, together with the PCP, initially assesses the musculoskeletal disease.

After our detailed analysis, we conclude that structures such as the one we present for rheumatology consultancy in situ make it possible to attend a high percentage of rheumatic patients at the right level of care. We believe that generalising this model in the rheumatology specialty would improve the operation and organisation of care and reduce unnecessary referrals and waiting lists, as it is an appropriate, effective, and efficient system that can be applied in many of our country's health areas.

#### Conflict of interests

The authors have no conflict of interests to declare.

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