Health-care use by rheumatoid arthritis patients compared with non-arthritic subjects

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Abstract

Objective. To compare the use of health-care by rheumatoid arthritis (RA) patients and non-arthritic subjects (NA) and to look for factors determining their patterns of health-care use.

Methods. A multicentre cohort of 223 RA and 446 NA subjects matched for age, gender, period of data collection and residence were questioned about their use of health-care services. Patterns of health-care use were identified by principal components analysis. Factors determining the use of health-care services were assessed by multiple linear and logistic regression analysis.

Results. The proportions of RA subjects who declared having had at least one contact with the health-care system in the previous 12 months and in the previous 4 weeks were higher than those for NA subjects for all health and social professionals except dentists and homeopaths. Types of health-care use explored were hospital, prescribed, general ambulatory and specialized ambulatory care. Factors determining health-care use were disease status, administrative area, employment status and age.

Conclusions. RA subjects use health-care services more widely than NA subjects. Variation in recourse behaviour is related to differences within administrative areas.

Key words: Health service research, Rheumatoid arthritis, Chronic disease.
Materials and methods

Population

The data were obtained from a multicentre study carried out between 1 January 1996 and 30 June 1997. Patients were sampled from three administrative areas in France—Lorraine, Champagne-Ardenne and Haute-Normandie—so as to potentially differentiate the various strategies of health-care use.

RA patients were recruited according to the EURIDISS (European Research on Incapacitating Disease and Social Support) study strategy [18] in two phases: the initial phase in 1991 was expanded in 1996. Patients were identified by public sector and private rheumatologists, general practitioners (GPs) and media and press announcements [19]. The inclusion criteria in both phases were RA according to the 1987 American Rheumatism Association classification criteria [20], disease duration less than 5 yr and residence in one of the three study regions. Subjects were excluded if they had had a handicap before RA, another incapacitating disease, were in stage IV of the Steinbrocker functional classification or had vasculitis. The clinical diagnoses of RA were confirmed by certified rheumatologists.

NA subjects from the general population were sampled among the participants in the SU.VI.MAX national prevention trial [21, 22] recruited from the general population through public media, and from local recruiting sources in each area [attendees at the Nancy (Lorraine) centre for preventive medicine and out-patient clinics at the university hospitals of Rouen (Haute-Normandie) and Reims (Champagne-Ardenne)]. Only subjects who stated that they did not have a chronic disease (whether self-perceived or patient-reported diagnosis) were included. As various studies have shown that, generally, elderly people and women make far more use of health-care services than others and that climatic fluctuations and geographical factors have an effect on the consumption of health-care services [23, 24], four matching criteria were used: age (±5 yr), gender, period of data collection (a maximum of 1 month was allowed between the data collection date for RA and NA subjects) and administrative area of residence.

In a pilot study (O. Ethgen, unpublished results) the average difference in mean number of contacts with health professionals per year between RA and NA subjects was estimated to be 9 (s.d. 50). We calculated the number of subjects for inclusion according to the low incidence of RA; statistical power was increased to 80% by matching two NA subjects with each RA subject. For a 5% type-I error, 287 RA subjects and 574 NA subjects were required.

Data collection

For NA subjects, data on health-care consumption together with socioeconomic information were collected by telephone. For RA patients, home or hospital interviews were conducted to collect clinical data and to complete a functional disability self-report questionnaire. The interviewers were physicians and nurses trained for this task. Informed consent was obtained before interviewing each subject.

Measures

The socioeconomic data collected were age, gender, living status (whether or not subjects lived alone), educational status (according to the International Standard Classification of Education), occupation (according to the International Standard Classification of Occupation), employment status (at home, unemployed, disabled, retired or at work), residence (rural or living in a city with under or over 10,000 inhabitants).

Data relating to health-care consumption were collected using the Health Service Information questionnaire, which was developed for the EURIDISS study [25]. It records the number of visits to GPs and specialists, the number of recourses to care provided by nurses and other health professionals (physiotherapists, occupational therapists, social workers, psychologists, domestic helps) during the preceding 4 weeks and during the preceding 12 months, the number of hospitalizations and the length of stay, and the occurrence of surgery during the preceding 12 months. For RA patients, we recorded the Steinbrocker classification, the Ritchie index, the date of disease onset and self-report of functional disability using the Health Assessment Questionnaire (HAQ) validated in French [26].

Data analysis

RA patient characteristics and health-care consumption were described using means and proportions as appropriate.

RA patients were compared with NA subjects for the sociodemographic variables and for the proportion of health-care consumption using Fisher’s exact test. The excess health-care consumption proportion was computed from recourses patterns in the two groups for the preceding 4 weeks and the preceding 12 months. The median number of health-care recourses was compared using the Mann–Whitney U-test for each period. Principal components analysis [27] was used to explore and identify the different patterns of health-care use by RA and NA subjects, on the basis of the number of visits to health professionals and services and the occurrence of hospitalization and of surgery in the previous 12 months. Each pattern represents a set of health resources frequently used in association. Several solutions were examined: a three-factor solution based on an eigenvalue threshold of 1.0 (a statistical measure of the power to explain variability between patients) and a four-factor solution significantly increasing the amount of total variance explained. Varimax orthogonal rotation was used to identify items with a factor loading over 0.4. The factors retained were the patterns of health-care represented according to the type of health-care loading on each
factor. Determinants of main health-care resource consumption (professionals and services) were identified for each of the five following dependent variables: numbers of visits in the past 12 months to a GP and to a specialist, number of recourses to nurses and para-medical professionals, entered in multiple linear regression model analyses, and hospitalization occurrence in a logistic regression model. After removal of subjects with some missing values, these analyses were run in 621 subjects in two steps. First, the candidate variables were chosen among the sociodemographic variables and the presence/absence of RA, when the significance threshold in univariate analysis was below 0.15. Secondly, the potential determinants of differences in health-care consumption between the RA and NA groups were tested as interaction terms in each model. Overall, the \( \alpha \) significance threshold was set at 0.05. The analyses were performed using BMDP software [28].

Results

Population characteristics

Data were obtained from 669 subjects (223 RA patients and 446 NA subjects). In the study sample, 31.4\% were living in Lorraine, 22.4\% in Champagne-Ardenne and 46.2\% in Haute-Normandie. At the time of the study, mean age was 53.8 yr and the sex ratio was 2.7 (Table 1). NA subjects had a significantly higher educational level (\( P < 0.001 \)), more frequently had a white-collar occupation (\( P < 0.001 \)) and were less frequently disabled or retired (\( P < 0.001 \)). RA patients had an average Ritchie index of 11.8 (s.d. 11.2) and the average score on the HAQ was 0.96 (0.76). Compared with other patients, the group of patients from Haute-Normandie had a significantly lower HAQ score and had a significantly shorter average disease duration (2.3 yr vs 5.6 for the Champagne-Ardenne group and 7.6 for the Lorraine group; \( P < 0.01 \)) (Table 2). According to the Steinbrocker classification, 23.9\% of patients were in stage I, 56.8\% in stage II, 17.6\% in stage III and 1.8\% in stage IV.

Health-care use

Medication was reported by 72\% of the subjects (92.3\% of the RA patients vs 62.1\% of the NA subjects; \( P < 0.0001 \)). The usual physician was a GP for 63.5\% of the RA patients and 90.3\% of the NA subjects (\( P < 0.0001 \)). Other physicians mentioned, in decreasing order of frequency, were the following specialists: rheumatologist then ophthalmologist, radiologist and surgeon for RA patients, and ophthalmologist, radiologist and cardiologist for NA. In women, 40.5\% of RA subjects and 51.5\% of NA subjects mentioned a gynaecologist. Hospitalization in the past 12 months was reported by 39.2\% of RA patients and 12.6\% of NA subjects (\( P < 0.0001 \)). The RA/NA ratio for hospitalization was 3.1. Surgery occurred in 19.8\% of RA patients and 9.4\% of NA subjects (\( P = 0.0002 \)). The average length of hospitalization was significantly longer for RA patients than for NA subjects (12.8 vs 6.8 days, \( P = 0.01 \)). RA patients reported having had, on average, contacts with six categories of professionals (0–13) during the previous 12 months, whereas NA subjects had had contact with about 3.0 (0–10). In both RA and NA groups, the number of categories contacted in the past 12 months was greater among women (on average 3.8 categories of professionals were consulted by the male subjects and 4.5 by the female subjects) and subjects with lower educational status (4.5 different professional categories for lower levels of education vs 3.8 for higher levels) and differed from one administrative area to another (4.0 in Lorraine, 3.9 in Champagne-Ardenne and 4.7 in Haute-Normandie; \( P = 0.0005 \)). No difference was noted according to residence in rural or urban areas.

<table>
<thead>
<tr>
<th>Table 1. Sample description</th>
<th>RA group ( (n = 223) )</th>
<th>NA group ( (n = 446) )</th>
<th>( p^a )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative area(^b) ( (n) )</td>
<td>Lorraine</td>
<td>70</td>
<td>140</td>
</tr>
</tbody>
</table>
| Residence \( (%) \) | Rural | 14.3 | 13.9 | \n | City, \(< 10,000 \) inhabitants | 46.6 | 39.1 | \n | City, \(> 10,000 \) inhabitants | 39.0 | 47.0 | \n | Living status \( (%) \) | Alone | 13.0 | 12.6 | \n | Not alone | 87.0 | 86.4 | \n | Education \( (%) \) | <6 yr | 44.6 | 24.9 | \n | 6–9 yr | 20.7 | 17.7 | \n | 10–12 yr | 19.2 | 26.2 | \n | >12 yr | 15.5 | 31.2 | \n | Occupation \( (%) \) | Armed forces | 0.5 | 4.1 | \n | Manager | 11.0 | 26.9 | \n | Professional | 10.6 | 18.1 | \n | Clerical | 23.9 | 23.0 | \n | Agricultural | 6.4 | 2.0 | \n | Manual worker | 30.3 | 14.7 | \n | Unemployed | 17.4 | 11.3 | \n | Employment status \( (%) \) | At home | 7.7 | 15.1 | \n | Unemployed | 5.4 | 2.7 | \n | Disabled | 12.6 | 0.7 | \n | Retired | 32 | 31.1 | \n | Working | 42.3 | 50.3 | \n

\(^a\) Fisher's exact test.

\(^b\) Matching criteria.
The number of contacts with a GP (mean ± s.d.) was 7.1 (5.1) and 3.8 (3.5) for RA and NA subjects respectively and the number of contacts with specialists 12.4 (31.8) and 4.0 (22.3). RA patients had significantly more contacts with medical, paramedical and social health professionals.

**Pattern of health-care consumption**

Table 5 shows the various profiles of health-care identified after principal components analysis and Varimax rotation. Four factors representing 65.9% of the total variance for all types of health-care used in the preceding 12 months were identified. Factor 1 represented hospital health-care, factor 2 comprised items relating to prescribed health-care, factor 3 related to general ambulatory health-care and factor 4 to specialized technical ambulatory health-care. In each pattern overall, RA patients had a significantly higher frequency of recourse to health-care use than NA subjects. However, it was not possible to identify specifically preferred patterns for either NA subjects or RA patients.
Table 5. Patterns of health-care use (principal components analysis

<table>
<thead>
<tr>
<th>Category of care used during the past 12 months</th>
<th>Factor 1: Hospital</th>
<th>Factor 2: Prescribed</th>
<th>Factor 3: General ambulatory</th>
<th>Factor 4: Specialized ambulatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>0.89</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>0.85</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>–</td>
<td>0.82</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Medical laboratory</td>
<td>–</td>
<td>0.79</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Nurse</td>
<td>0.46</td>
<td>0.53</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Other health professional&lt;sup&gt;b&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>0.77</td>
<td>–</td>
</tr>
<tr>
<td>Social professional&lt;sup&gt;c&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>0.73</td>
<td>–</td>
</tr>
<tr>
<td>Specialist physician&lt;sup&gt;d&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.95</td>
</tr>
<tr>
<td>GP</td>
<td>–</td>
<td>–</td>
<td>0.48</td>
<td>–</td>
</tr>
<tr>
<td>Percentage of variance explained</td>
<td>26.5</td>
<td>15.6</td>
<td>12.8</td>
<td>11.0</td>
</tr>
</tbody>
</table>

<sup>a</sup>Factor loadings: only coefficients above 0.4 are presented.<br>
<sup>b</sup>Physiotherapist or occupational therapist.<br>
<sup>c</sup>Home help or social worker.<br>
<sup>d</sup>All physicians except GP.<br>

Table 6. Factors related to differences in health-care used in the past 12 months between RA and NA subjects (n = 621)<sup>e</sup>

<table>
<thead>
<tr>
<th>GP&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Specialist&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Nurse&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Other health professional&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Hospitalization&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.72</td>
<td>3.13</td>
<td>1.32</td>
<td>1.53</td>
</tr>
<tr>
<td>Disease status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NA&lt;sup&gt;d&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1</td>
</tr>
<tr>
<td>RA</td>
<td>2.72</td>
<td>5.52</td>
<td>5.53</td>
<td>4.52</td>
</tr>
<tr>
<td>Administrative area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorraine&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td>n.s.</td>
<td>n.s.</td>
<td>1</td>
</tr>
<tr>
<td>Champagne-Ardenne</td>
<td>–0.14</td>
<td>0.79</td>
<td></td>
<td>1.53 (0.79–2.94)</td>
</tr>
<tr>
<td>Haute-Normandie</td>
<td>–1.23</td>
<td>–0.78</td>
<td></td>
<td>0.24 (0.11–0.54)</td>
</tr>
<tr>
<td>Educational status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;6 yr</td>
<td>–</td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>6–9 yr</td>
<td>–0.07</td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>10–12 yr</td>
<td>–0.53</td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>&gt;12 yr</td>
<td>–1.40</td>
<td></td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work&lt;sup&gt;d&lt;/sup&gt;</td>
<td>–</td>
<td>–</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Unemployed</td>
<td>–0.80</td>
<td>0.26</td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>Disabled&lt;sup&gt;e&lt;/sup&gt;</td>
<td>2.13</td>
<td>26.90</td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>Retired</td>
<td>0.53</td>
<td>–0.85</td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>At home</td>
<td>–0.54</td>
<td>–1.60</td>
<td></td>
<td>n.s.</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>0.73</td>
<td>n.s.</td>
<td>n.s.</td>
<td>n.s.</td>
</tr>
<tr>
<td>Disease status x area</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RA x Champagne-Ardenne</td>
<td>–</td>
<td>n.s.</td>
<td>0.26</td>
<td>n.s.</td>
</tr>
<tr>
<td>RA x Haute-Normandie</td>
<td>10.14</td>
<td></td>
<td></td>
<td>4.66 (1.61–13.5)</td>
</tr>
</tbody>
</table>

<sup>a</sup>All patients were included, whatever their level of health-care used.<br>
<sup>b</sup>Regression coefficients in multivariate model.<br>
<sup>c</sup>Odds ratio and 95% confidence interval in logistic model.<br>
<sup>d</sup>Reference class.<br>
<sup>e</sup>Not significant.<br>

Table 6 shows the variables related to the differences in health-care resource use for the main categories of health professionals. The presence of RA was associated with increased recourse to a GP, specialist physician, nurse, other health professional or hospitalization. Disabled subjects (mostly RA) showed more frequent access to GPs and specialist physicians. Unemployed subjects showed less frequent recourse to GP care.

Depending on the sampling area, RA patients and NA subjects did not use health resources in the same way for GPs, nursing care and hospitalization. Compared with RA patients in Lorraine, those in Haute-Normandie used more nursing care (16.2 contacts in Haute-Normandie vs 7.9 in Champagne-Ardenne and 6.8 in Lorraine). RA patients in Champagne-Ardenne were more frequently hospitalized (odds ratio 7.2 vs 2.9 for Haute-Normandie and 2.6 for Lorraine).

Discussion

This study shows that RA patients tend to use health-care resources more frequently, more intensively and
in a more diverse manner than NA subjects. It was not possible to identify a specific profile of health-care use in RA patients, but their access to and use of various types of health-care evidenced greater geographical variation than was the case in the NA group.

The population of RA patients recruited in each area was large. Indeed, RA is not a very common disease in France [29]. Although the expected number of subjects was not achieved, the observed variance in the number of contacts was much lower than expected (the S.D. was 4.3 for GPs and 28.9 for specialists), leading to a power of 99% and 97% respectively in one-sided direct comparisons. In each of the three areas, the sample was selected from university hospital wards, GPs and specialists (mainly rheumatologists) in both public and private practice. To avoid a diagnosis bias, each patient diagnosis was confirmed by a certified rheumatologist. Although the sample was not exhaustive, its representativeness spanned the first 10 yr of the disease. Some difference in disease severity was related to differences in disease duration across areas. Some RA patients declared another health problem during the study (e.g. high blood pressure or depression) but the comparison of health-care use between RA with and without other health problems was not significant, except for the use of GPs.

NA subjects were recruited from several sources attached to specific organizations (such as preventive medicine centres) in each administrative area. Neither those participating in the SU.VI.MAX prevention trial nor the other subjects recruited used more homeopathic care than the general population [30]. The inclusion criteria for NA subjects was the perceived absence of any chronic morbid condition and patient-reported diagnosis rather than physician-diagnosed morbidity. The perception of sickness is the primary motive for demanding health-care [31]. Thus, perceived morbidity and subjective health status are related to health-care use [32]. Only chronic conditions were used as exclusion criteria in our study. Acute conditions that were quite likely to have occurred during the preceding 12 months, which would explain sporadic or short-term health-care use in a similar fashion in RA and NA subjects, were not used as exclusion criteria. Indeed, any incremented occurrence of acute conditions in RA would have been accounted for in the overall increment in the use of health-care by the RA patients.

The exact recording of ambulatory and hospital health resources use according to diagnostic categories is not possible in France at present. It would have been interesting to know the exact number of recourses to health-care services during the previous 12 months and 4 weeks. The lack of a centralized patient-based system of this sort led to inclusion in the study of an investigation of the self-declaration of health-care resource use. We cannot exclude the possibility that part of the difference between RA and NA cases can be explained by this recording method. Some articles have compared the response bias for various strategies for data collection. All have found that the use of telephone interviews may have considerable cost benefits. Three articles about specific subjects, such as alcohol and drug use, show that telephone surveys yielded lower estimates of recourse [33–35]; another, concerning outcomes of very low birth weight infants (based on Likert-type items), reports high internal consistency in responses (Cronbach’s x) [36]. The conclusion of these studies is that concordance between methods depends on the type of question (yes/no format, response options), the population studied and the time when the survey was performed [33, 37].

Reported health-care use, in terms of values and proportions, was consistent between the previous 4 weeks and the previous 12 months but was slightly higher in the recent past, indicating limited recall bias over time, i.e. a fall-off phenomenon [38]. The expanding development of computerized databases in health-care systems is likely to provide more accurate data. The policy of improving medical information systems in hospitals together with the computerization of practitioners’ surgeries, now under way in France, should make this sort of facility available in the near future.

Overall, there was more use of all resources by RA than by NA subjects. This result is closely akin to those of other studies. Gabriel et al. [39] estimated that the number of days in hospital was three times higher for RA patients than for subjects without chronic disease; this figure is similar to the findings of the present study: 3.1 for hospital use and 4.2 for the use of nurses.

In the present study, 93.3 and 80.3% of RA patients used GPs and specialists respectively during the previous 12 months. In Europe, the mean annual number of health-care recourses per person is lower in Scandinavian countries (3.5–5.5) than in France (7.2) [40]. In a cost estimate study, Gabriel et al. [6] found a significant difference between the proportions of medical care consumption in the previous 12 months between RA and NA subjects (89.9 vs 82.0% for people who had never had a diagnosis of arthritis), which is close to the present observation. Lanes et al. [15] found a rate of 95.6% for health-care use in a sample of 365 RA subjects in the USA. There is greater discrepancy across studies as to the number of yearly contacts. Close to the present observation, 13.9 and 19.4 contacts were reported in prepaid group practice and fee-for-service respectively [2]. Criswell et al. [41] reported an average of 6.6 contacts with a rheumatologist. Several studies differentiated the number of contacts motivated by RA and those motivated by another condition [1, 2, 6, 15, 42]. In our study, the lack of systematic recording of physicians’ activity made it impossible to identify the motives for contact with the particular service provider; such information obtained directly from the patient would not have been reliable enough. Moreover, several conditions may motivate the patient and be treated in a single contact.

In the current French health-care system, free access to specialist rheumatologists accounts for 82% of instances of recourse to health-care by RA patients. Similar proportions are observed in other systems, for
example 84% in a health maintenance organization [15] and 83% reported by Yelin et al. [43]. Other health professionals are used differently in France (23% of RA patients have an average of 11.5 contacts with physiotherapists and occupational therapists) than in the USA (6.9 per year [44]); this is probably related to the possibility of reimbursement. We conclude that the presence of a chronic disease such as RA induces an increase in the demand for health-care and an increase in the number of consultations and recourse to specialist consultations.

Almost 40% of RA patients in our sample had been hospitalized in the preceding 12 months, i.e. three times the percentage of NA subjects. Of those entering hospital, 19.8% underwent surgery, two-thirds of which was related to RA, i.e. 5.1% of all patients had had RA related surgery in the past 12 months. When other authors attempted to differentiate among motives for entering hospital, between 10 and 48% of the motives were related to RA [2, 15, 43]. A recent report from German Collaborative Centre database reported 16% hospital stay per year for RA subjects in 1998. This lower rate may be due to differences in referral processes compounded by the ratio of rheumatologists per working inhabitant, which is more than six times higher in France (about 2000 for 60 million vs 400 for 80 million in Germany); this may mean that the availability of health resources in ambulatory and hospital care may be wider in France than in Germany [17]. This variability is probably related to the way in which the choice between ambulatory and hospital care is made by general health-care organizations and professionals [45]. The cost of hospitalization ranges from 10 to 50% of the total cost of RA [15, 44]. The costs of laboratory investigations and diagnostic and therapeutic procedures are also higher for RA than for NA subjects [6, 15]. Lubeck estimates that laboratory tests represent 19.8% of the mean annual health-care cost vs 37.1% for medication and 18.8% for consultations [42].

The results of the present study indicate a 30% increment in the consumption of medication in RA. As shown in other studies [15, 42, 46], medication in RA represents a significant economic cost. The French social security insurance system covers about 98% of the population. Complementary health insurance is not compulsory. A study comparing the use of resources by RA patients according to prepaid group practice or fee-for-service systems did not note significant differences in terms of economic cost and outcome in the USA [2].

Four patterns of health-care were identified as preferred associated categories of health professionals, i.e. non-mutually exclusive networks, used both by RA and NA individuals: these comprised hospital, prescribed, general ambulatory and specialized ambulatory care. In a study conducted in five European countries (the EURIDISS study), a factor analysis, excluding hospital care, identified similar patterns of health-care, namely specialist care, generalist care, supportive care (occupational therapist and social worker) and alternative community care [47]. From this study, it appears that a specific feature in France is the correlation between GP care and supportive health-care, both of which load on a single factor. This feature is in contrast with the much greater consumption of supportive nursing care in Scandinavian countries [48].

The variation in health-care use according to administrative area and sociodemographic parameters was evident in our study, as was also found for different countries in the European study. This indicates that the amount and pattern of health-care use are related to the organization of the national health-care system and the structures of the professional networks within each country.

Age, employment status and health-care administrative area were three determinants that RA and NA subjects had in common with respect to the use of GPs, specialists and nurses and the occurrence of hospitalization. Elderly people are commonly expected to have lower health status and to use more health-care resources. Variation in employment status accounted for some of the difference in the use of GPs and specialists: disabled people (mostly RA patients who were receiving a disablement pension) had significantly more contact with GPs and specialists than people in work. Health-care use in the overall sample differed across areas, reflecting a non-specific trend of the population to use GPs more frequently in Lorraine, hospitalization in Champagne-Ardenne and nurses in Haute-Normandie. Similar observations have been reported with respect to variation in the frequencies of various surgical procedures between small areas within the United States and other countries [49].

Among the potential determinants of the excess use of hospitalization and nursing care in RA in comparison with the general population, the administrative area for health-care was the only significant factor. This may be explained partially by the availability of health-care. The density of health professionals per geographical unit did not show a large amount of variation among areas in the survey, but within the French health-care system it is possible that variations of this sort may be accounted for by discrepancies related to the formal or informal organization of referral patterns, health professional networks, the relationships between public and private professionals, hospital and ambulatory health-care, and inequalities in service providers across regions. A recent report has shown the persistence of regional differences in the availability and consumption of health-care in France [50]. However, the effect of such variation may be moderate, as no specific determinants among those explored were identified that might explain the increment in recourse to GPs, specialists or other health professionals in RA.

Conclusion

Compared with subjects reporting no chronic condition, RA patients show greater use of health-care resources in the form of health-care delivered by various health
professionals on prescription (nurses, pharmacists, occupational physiotherapists, etc.) and, to a lesser degree, in the form of health-care delivered by specialists other than rheumatologists. The variation in practices that is found within the French health-care system might be associated with regional differences in the wider use of health-care resources by RA patients than by NA patients.

Findings such as those of the present study should be taken into account in attempts to optimize the organization of health-care systems, particularly with respect to chronic conditions such as RA, for instance by establishing efficient professional networks while ensuring cost containment.

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References


43. Yelin EH, Such CL, Criswell LA, Epstein WV. Outcomes for persons with rheumatoid arthritis with a rheumatologist versus a non-rheumatologist as the main physician for this condition. Med Care 1998;36:513–22.


