The impact of COVID-19 on rheumatology practice across Africa

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Abstract

Objectives. To identify the changes in rheumatology service delivery across the five regions of Africa from the impact of the COVID-19 pandemic.

Methods. The COVID-19 African Rheumatology Study Group created an online survey consisting of 40 questions relating to the current practices and experiences of rheumatologists across Africa. The CHERRIES checklist for reporting results of internet e-surveys was adhered to.

Results. A total of 554 completed responses were received from 20 countries, which include six in Northern Africa, six in West Africa, four in Southern Africa, three in East Africa and one in Central Africa. Consultant grade rheumatologists constituted 436 (78.7%) of respondents with a mean of 14.5 ± 10.3 years of experience. A total of 77 (13.9%) rheumatologists avoided starting a new biologic. Face-to-face clinics with the use of some personal protective equipment continued to be held in only 293 (52.9%) rheumatologists' practices. Teleconsultation modalities found usage as follows: telephone in 335 (60.5%), WhatsApp in 241 (43.5%), emails in 90 (16.3%) and video calls in 53 (9.6%). Physical examinations were mostly reduced in 295 (53.3%) or done with personal protective equipment in 128 (23.1%) practices. Only 316 (57.0%) reported that the national rheumatology society in their country had produced any recommendation around COVID-19 while only 73 (13.2%) confirmed the availability of a national rheumatology COVID-19 registry in their country.

Conclusion. COVID-19 has shifted daily rheumatology practices across Africa to more virtual consultations and regional disparities are more apparent in the availability of local protocols and registries.

Key words: COVID-19, Africa, rheumatology, DMARD, rheumatic and musculoskeletal diseases, telemedicine
Introduction

Africa has long battled the double burden of infections and non-communicable diseases. Despite this, the COVID-19 pandemic has thrown up new challenges that have further compromised the inadequate rheumatology services across the continent. There is a wide disparity in the standard of healthcare available among countries in Africa and this is particularly striking with the management of rheumatic and musculoskeletal diseases (RMDs). Some countries do not have any practicing rheumatologist and in most parts of the continent, rheumatology is a relatively young specialty with national rheumatologist and in most parts of the continent, rheumatology is a relatively young specialty with national rheumatology societies either nonexistent or not fully functional [1]. Across Africa, there is also a shortage of physical and occupational therapists, podiatrists and rheumatology specialist nurses.

Uncertainties regarding the risk of contracting COVID-19 in patients taking DMARDS have generated concerns among rheumatologists and patients alike. However, currently available data suggest that RMD patients are not at a greater risk than the general population [2]. In Australia, 80% of rheumatology clinic consultations are now done remotely via telephone consultations while inpatient care is provided by a few personnel with infection control measures [3]. Scaling up of telemedicine services in response to the pandemic may be impracticable in many African countries where such services are non-existent or relatively underdeveloped. Despite these limitations, the current situation may be an opportunity for the creative use of available technology to ensure patient care in both urban areas and remote rural communities.

Outside Africa, recommendations have been developed by rheumatology societies in America, Europe, Asia and Australia [4–7]. Some of these, where applicable, are being adopted by African practitioners, although African guidelines are currently under development by a taskforce of the African League Against Rheumatism. The ACR recommends that in addition to standard protective measures, patients should continue most of their medications except when infected by COVID-19. Advocacy for protected supply of HCQ for rheumatic patients has also been made in view of shortages caused by initial claims of its efficacy in treating COVID-19 [5].

With similar challenges faced by the relatively small African rheumatology workforce, it seemed appropriate to examine our peculiar situation [1]. The COVID-19 African Rheumatology Study Group was formed as a network of rheumatologists from all regions of the continent. It heralds a pan-African collaboration that will hopefully address unmet needs in rheumatology research and practice. This study aimed to identify changes in rheumatology service delivery due to COVID-19 and to highlight the regional disparities.

Methods

The COVID-19 African Rheumatology Study Group was formed through the network of the African League Against Rheumatism. An online survey was created using the surveymigo application (available at www.surveymigo.eu). It consisted of 40 practice and experience questions covering the following domains: changes in patient management; changes in rheumatology service delivery; protocols, recommendations and the roles of national rheumatology societies; observed patient behaviours and key rheumatologist concerns regarding COVID-19. The survey was administered in English and content and face validity were tested by eight consultant rheumatologists, 12 rheumatology fellows and 12 non-rheumatologist physicians and the final versions were accepted by all co-researchers after four reviews. The questionnaire was designed to be completed in 6 minutes.

All consenting consultant grade and training fellows in rheumatology in all member countries of AFLAR were invited to participate via email and WhatsApp groups of AFLAR, national rheumatology societies and regional or local networks. The survey ran for a week spanning between 28 April and 4 May 2020 in all countries except in Egypt where it ran between 1 and 7 May, inclusive. The CHERRIES checklist for reporting results of internet surveys was adhered to [8]. Exported data was entered into Stata version 16 for analysis and incomplete responses were excluded from the analysis. Data were summarized using frequencies and proportions. Institutional ethical approval was not required for this study.

Results

A total of 568 responses were received out of which 14 were incomplete. The 554 completed responses were received from 20 countries and included in the analysis.
The countries captured included six in Northern Africa, six in West Africa, four in Southern Africa, three in East Africa and one in Central Africa. It was not possible to ascertain the total number of rheumatology doctors on the continent to calculate the response rate. In the countries where these figures could be verified, not <20% response rate per country (e.g. 43 out of 123 in South Africa) and up to 100% in the countries with fewer practitioners (e.g. 12 out of 12 in Kenya and one out of one in Benin) was achieved. Northern, Southern and West Africa had 431 (77.8%), 54 (9.8%) and 43 (7.8%) responses, respectively; while 20 (3.6%) were obtained from East Africa and six (1%) from Central Africa. The respondents comprised of 437 (78.9%) consultants and 117 (21.1%) fellows in training with an overall mean age of 42.6 ± 11.2 years. There were 340 (72.2%) female respondents and the mean duration of practice experience among the consultants was 14.5 ± 10.3 years. Table 1 shows the breakdown of respondents across countries and regions.

The changes to the practices of the respondents are shown in Table 2. Clinical advice on self-isolation, social distancing and shielding have been given by 498 (89.9%), 548 (98.9%) and 240 (43.3%) respondents, respectively. The advice to use complementary and alternative medicine against COVID-19 has been given by 182 (32.9%) while 271 (48.1%) have advised the use of vitamins to boost immunity against COVID-19. Conventional synthetic DMARDs like methotrexate were maintained in 500 (90.3%), reduced in 36 (6.5%), deferred in seven (1.3%) and stopped in 11 (2.0%). A total of 77 (13.9%) rheumatologists avoided starting a new biologic for fear of patient predisposition to SARS-CoV-2 infection. The prescription of HCQ as COVID-19 prophylaxis had been done by 19 (3.4%) respondents.

The changes being experienced in services are as in Table 3. Face-to-face clinics with the use of some personal protective equipment continued to be held in 293 (52.9%) rheumatologists' practices. Teleconsultation modalities that were being used included videos in 53 (9.6%), telephone in 335 (60.5%), e-mails in 90 (16.3%) and mobile chats such as WhatsApp in 241 (43.5%) respondents. Sixty-eight (12.3%) respondents were not doing any form of physical examinations, while physical examinations were reduced in 295 (53.3%) or done with personal protective equipment in 128 (23.1%) practices. Seventy-seven (13.9%) rheumatology services did not have allied health professional (AHP) clinics prior to now but since the onset of the pandemic, AHP services have reduced in 266 (48.0%) and completely shut down in 199 (35.9%).

There were disparities in the availability of COVID-19 recommendations produced by national bodies across different regions. Only 316 (57.0%) reported that they had such published recommendations and these were 258 (46.6%) in Northern and 34 (6.1%) in Southern Africa. Most participants had no locally agreed protocol on DMARD use or national rheumatology COVID-19 registry in their country of practice. Table 4 shows the local and national practices across the five regions.

**Discussion**

This collaborative effort represents one of the ongoing attempts to build African rheumatology beyond regional or language barriers. Although respondents were predominantly from Northern Africa, this study had a pan-African spread with participation from 20 countries. The relatively low representation from central and, to some extent, West Africa may have resulted from unsuccessful efforts to engage the few rheumatologists from some francophone countries in those regions. Overall, African rheumatology appears to be female dominated with the average age of respondents being 42.6 years. This represents an active population with many research possibilities if properly harnessed. Although, there is ample experience (mean practice duration of 14.5 years) from the bulk of rheumatologists who happen to be consultants, there is a need to improve specialist training capacity in order to cater for the growing burden of RMDs. Adult rheumatologists form the bulk (53.4%) with pure paediatric rheumatologists being a rare species at 2.7%. Hence, there is unarguably an urgent need for paediatric rheumatology across the continent [9].

As of the end of July, cases of COVID-19 in Africa have exceeded 800,000 and recorded deaths are over 17,500 [10]. Rheumatologists have found themselves in the position of having to advise patients to self-isolate, socially distance or even completely shield away from all potential exposure to other people through whom they might be at higher risk of contracting the novel coronavirus. However, shielding advice was provided by less than half of African rheumatologists. This is likely because most African countries do not have robust social welfare programs as in the high-income countries and as such they cannot provide the necessary government support for full shielding of vulnerable individuals. As a long list of manifestations of COVID-19 that may mimic those of RMDs have been identified [11], rheumatologists are saddled with the moral burden of preventing patients from being infected with SARS-CoV-2 and to separate a flare-up of RMDs from what could be COVID-19 symptoms.

In the face of the current realities, there has been a noticeable switch to more remote consultations using telephones or chat applications. Use of e-mails and videoconferencing are still unpopular, likely due to technological limitations. A single-centre report from Australia has described remarkable success using tele-rheumatology for up to four-fifths of outpatient appointments [3]. In order to maintain access to care for patients on self-isolation or in areas on lockdown, telemedicine may serve as a useful adjunct to usual care, especially for stable chronic diseases that do not require frequent in-patient care [12].

Available data has not established a deleterious impact of ongoing treatment with DMARDs on the risk of infection with SARS-CoV-2 or outcome of COVID-19 [13–15]. However, it is perhaps unsurprising that rheumatologists may exhibit some uneasiness prescribing
### Table 1: Breakdown of rheumatologists

| Region          | Algeria | Egypt | Libya | Morocco | Tunisia | Sudan | Benin | Ghana | Nigeria | Senegal | Mali | Ivory Coast | Cameroon | Kenya | Madagascar | Mauritius | Mozambique | Tanzania | South Africa | Zambia | Total |
|-----------------|---------|-------|-------|---------|---------|-------|-------|-------|---------|---------|------|-------------|----------|-------|-------------|-----------|------------|----------|--------------|--------|-------|
| Gender          | Male    | 22    | 12    | 0       | 42      | 14    | 2     | 1     | 2       | 21      | 1    | 2          | 1        | 5     | 3           | 2         | 0          | 1       | 21          | 1      | 154   |
| Age, mean (s.d.)|         | 41.5  | 38.5  | 55.0    | 44.9    | 42.2  | 44.3  | 42.0  | 38.8    | 39.7    | 50.0 | 40.5       | 52.0     | 47.2 | 37.1        | 34.3      | 49.5       | 37.0    | 48.5        | 49.0  | 52.0  |
| Level           | Consultants | 55    | 101   | 134     | 53      | 2     | 1     | 3     | 19      | 1       | 2    | 1          | 6        | 5     | 3           | 4         | 1          | 1       | 41          | 2      | 436   |
| Practice scope  | Adult   | 35    | 42    | 0       | 106     | 42    | 5     | 0     | 0       | 8       | 0    | 0          | 1        | 11    | 3           | 2         | 0          | 1       | 40          | 0      | 296   |
|                  | Paediatric | 1     | 2     | 1       | 0       | 2     | 0     | 0     | 1       | 0       | 0    | 0          | 0        | 0     | 1           | 0         | 0          | 0       | 7           | 0      | 15    |
|                  | Both    | 28    | 86    | 49      | 32      | 0     | 1     | 4     | 25      | 1       | 2    | 1          | 5        | 0     | 1           | 2         | 1          | 1       | 22          | 2      | 288   |
| Practice setting | Academic hospital | 24    | 99    | 1       | 43      | 40    | 3     | 1     | 5       | 26      | 1    | 1          | 1        | 3     | 9           | 4         | 0          | 1       | 2           | 25     | 288   |
|                  | Private hospital | 2     | 2     | 0       | 5       | 1     | 0     | 0     | 0       | 0       | 0    | 0          | 0        | 1     | 0           | 1         | 0          | 0       | 11          | 0      | 23    |
|                  | Govt. clinic | 5     | 25    | 0       | 6       | 3     | 1     | 0     | 0       | 7       | 0    | 0          | 1        | 1     | 1           | 0         | 2          | 0       | 0           | 1      | 52    |
|                  | Private group | 3     | 2     | 0       | 1       | 3     | 2     | 0     | 0       | 0       | 0    | 0          | 0        | 1     | 0           | 0         | 0          | 0       | 3           | 0      | 15    |
|                  | Private solo | 26    | 0     | 0       | 63      | 23    | 0     | 0     | 0       | 0       | 1    | 0          | 1        | 0     | 0           | 0         | 0          | 0       | 10          | 0      | 124   |
| Others           | 4       | 2     | 0     | 37      | 4       | 1     | 0     | 0     | 0       | 0       | 0    | 0          | 1        | 0     | 0           | 1         | 0          | 0       | 2           | 0      | 52    |
drugs that frequently predispose patients to infections in the middle of a pandemic, especially as new data has suggested that people on up to 10 mg/day of prednisolone have higher odds of hospitalization for COVID-19 [16]. On the other hand, many DMARDs are being evaluated in clinical trials across the world for potential roles in various phases of COVID-19 [11, 17]. Also, various concepts of rheumatology practice such as ‘window of opportunity’, ‘sequential therapies’, ‘treatment combinations’ and ‘treat-to-target’ are being examined as possible approaches to the treatment of COVID-19 [18].

The widespread absence of local or national guidelines for managing RMDs in the face of the pandemic represents a crucial area of inadequacy across the African continent. It is important to accept that international organizations outside Africa are less likely to address clinical conundrums that are specific to the African setting and, as such, the coalition of associations of African rheumatology will need to lead the charge to develop clinical guidelines. The recommendations developed by the ACR and the European League Against Rheumatism are useful guides in certain respects [19, 20]. These are among the first official guidelines for the management of RMDs during the COVID-19 pandemic and while they may not address certain themes that are unique to Africa, they certainly shed some light on a few universal issues.

Only 13.2% of our respondents were aware of a COVID-19 disease registry for rheumatic patients in their country. However, the global registries are more popular in Africa and the COVID-19 Global Rheumatology Alliance is a leading registry, which was established in

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**Table 2** Changes in the practice(s) of rheumatologists

|                          | Northern Africa | West Africa | Central Africa | East Africa | Southern Africa | Total |
|--------------------------|----------------|-------------|----------------|------------|----------------|-------|
|                          | n = 431 (%)     | n = 43 (%)  | n = 6 (%)      | n = 20 (%) | n = 54 (%)      | n = 554 (%) |

**Clinical advice given to patients**

- Self isolation: 385 (89.3)
- Social distancing: 426 (98.8)
- Shielding: 184 (42.7)
- Use of alternative medicine: 169 (39.2)
- Use of vitamins: 224 (52.0)
- Days off/workplace adjustment letter given: 262 (60.8)

**Changes to csDMARD prescription e.g. MTX**

- None: 392 (91.0)
- Reduced dosing: 25 (5.8)
- Deferred use: 7 (1.6)
- Stopped: 7 (1.6)

**Increased use of HCQ**

- Yes: 36 (8.4)
- No: 395 (91.6)

**Use of steroids**

- Unchanged: 237 (55.0)
- Increased frequency: 5 (1.2)
- Increased dosing: 2 (0.5)
- Reduced dosing: 158 (36.7)
- Avoiding steroids: 82 (19.0)

**Biologic prescribing**

- Avoid: 66 (15.3)
- Biologics not available: 45 (10.4)
- Increased frequency: 1 (0.2)
- Reduced dosing: 21 (4.9)
- Unchanged: 298 (69.1)

**Prescription of HCQ to prevent severe COVID-19 disease**

- Yes: 12 (2.8)
- No: 303 (70.3)

**Dosing of HCQ adjusted in patients already on it**

- No: 346 (80.3)
- Yes, reduced dose for supply to last: 57 (13.2)
- Yes, increased dose for prevention against COVID-19: 5 (1.2)
- Yes, switched to other DMARD due to shortage: 43 (10.0)

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https://academic.oup.com/rheumatology
March 2020 to gather data on a worldwide scale relating to RMDs and COVID-19 [21]. Currently, enrolment in the physician registry stands at 3814, while the patient-facing registry has 13110 contributions including 787 with COVID-19 [22]. Beyond COVID-19, disease registries for various RMDs, which afflict Africans sometimes more than people in other regions of the world, will be useful for providing richer perspectives to disease burden and their characteristics. Hopefully, this would lead to more research into developing specific therapies.

The strength of this survey is in its pan-African reach, a feat that sensitizes rheumatologists across the

| TABLE 3 Changes in services | Northern Africa | West Africa | Central Africa | East Africa | Southern Africa | Total |
|----------------------------|----------------|------------|----------------|------------|----------------|-------|
|                             | n = 431 (%)    | n = 43 (%)  | n = 6 (%)      | n = 20 (%) | n = 54 (%)     | n = 554 (%) |
| HCQ shortage experienced    | 271 (62.9)     | 39 (90.7)  | 6 (100.0)      | 10 (50.0)  | 42 (77.8)      | 368 (66.4) |
| Current out-patient service |                |            |                |            |                |       |
| None (all shut down)        | 30 (7.0)       | 7 (16.3)   | 1 (16.7)       | 4 (20.0)   | 6 (11.1)       | 78 (14.1) |
| Clinic visits as before     | 231 (53.6)     | 18 (41.9)  | 5 (83.3)       | 10 (50.0)  | 26 (48.1)      | 46 (8.3)  |
| Face to face with some PPE  | 35 (8.1)       | 4 (9.3)    | 0 (0.0)        | 1 (5.0)    | 12 (22.2)      | 293 (52.9) |
| Video consultation          | 255 (59.2)     | 34 (79.1)  | 4 (66.7)       | 10 (50.0)  | 32 (59.3)      | 53 (9.6)  |
| Phone                       | 60 (13.9)      | 6 (14.0)   | 0 (0.0)        | 1 (5.0)    | 23 (42.6)      | 335 (60.5) |
| Emails                      | 183 (42.5)     | 32 (74.4)  | 2 (33.3)       | 6 (30.0)   | 18 (33.3)      | 90 (16.3) |
| Chats e.g. WhatsApp         | 55 (12.8)      | 9 (20.9)   | 0 (0.0)        | 4 (20.0)   | 13 (24.1)      | 241 (43.5) |
| Mode of physical examination|                |            |                |            |                |       |
| None                        | 51 (11.8)      | 5 (11.6)   | 0 (0.0)        | 1 (5.0)    | 9 (16.7)       | 68 (12.3) |
| Reduced                     | 223 (51.7)     | 29 (67.4)  | 5 (83.3)       | 11 (55.0)  | 45 (83.3)      | 295 (53.3) |
| Full exams with PPE         | 86 (20.0)      | 13 (30.2)  | 2 (33.3)       | 4 (20.0)   | 18 (33.3)      | 128 (23.1) |
| Pictures/videos             | 82 (19.0)      | 10 (23.3)  | 0 (0.0)        | 0 (0.0)    | 9 (16.7)       | 104 (18.8) |
| Full exams as before COVID  | 67 (15.5)      | 2 (4.7)    | 1 (16.7)       | 4 (20.0)   | 6 (11.1)       | 76 (13.7) |
| Changes to rheumatology AHP clinics |       |            |                |            |                |       |
| Never had these             | 70 (16.2)      | 2 (4.7)    | 0 (0.0)        | 0 (0.0)    | 5 (9.3)        | 77 (13.9) |
| Had but now shut down       | 177 (41.1)     | 8 (18.6)   | 0 (0.0)        | 5 (25.0)   | 9 (16.7)       | 199 (35.9) |
| Reduced service             | 180 (41.8)     | 29 (67.4)  | 5 (83.3)       | 15 (75.0)  | 37 (68.5)      | 266 (48.0) |
| Functioning as before       | 3 (0.7)        | 4 (9.3)    | 1 (16.7)       | 0 (0.0)    | 3 (5.6)        | 11 (2.0)  |
| Changes to blood monitoring for DMARDs |       |            |                |            |                |       |
| No changes                  | 29 (6.7)       | 11 (25.6)  | 0 (0.0)        | 2 (10.0)   | 0 (0.0)        | 42 (7.6)  |
| Reduced frequency           | 220 (51.0)     | 19 (44.2)  | 1 (16.7)       | 13 (65.0)  | 23 (42.6)      | 276 (49.8) |
| Suspended                   | 54 (12.5)      | 1 (2.3)    | 0 (0.0)        | 3 (15.0)   | 7 (13.0)       | 65 (11.7) |
| Not offered in the service  | 127 (29.5)     | 12 (27.9)  | 5 (83.3)       | 2 (10.0)   | 24 (44.4)      | 170 (30.7) |

AHP: allied health professional; PPE: personal protective equipment.

| TABLE 4 Local and national practices | Northern Africa | West Africa | Central Africa | East Africa | Southern Africa | Total |
|--------------------------------------|----------------|------------|----------------|------------|----------------|-------|
|                                     | n = 431 (%)    | n = 43 (%)  | n = 6 (%)      | n = 20 (%) | n = 54 (%)     | n = 554 (%) |
| Has the national rheumatology society in your country produced any recommendation around COVID-19? |       |            |                |            |                |       |
| Yes                                  | 258 (59.9)     | 13 (30.2)  | 2 (33.3)       | 9 (45.0)   | 34 (63.0)      | 316 (57.0) |
| No                                   | 154 (35.7)     | 25 (58.1)  | 4 (66.7)       | 11 (55.0)  | 17 (31.5)      | 211 (38.1) |
| There is no national body            | 19 (4.4)       | 5 (11.6)   | 0 (0.0)        | 0 (0.0)    | 3 (5.5)        | 27 (4.9)  |
| Any locally agreed protocol on DMARD use in your centre? |       |            |                |            |                |       |
| Yes                                  | 182 (42.2)     | 11 (25.6)  | 2 (33.3)       | 5 (25.0)   | 27 (50.0)      | 227 (41.0) |
| No                                   | 204 (47.3)     | 31 (72.1)  | 4 (66.7)       | 15 (75.0)  | 24 (44.4)      | 278 (50.2) |
| Not applicable                       | 44 (10.2)      | 7 (16.3)   | 0 (0.0)        | 0 (0.0)    | 3 (5.6)        | 54 (9.8)  |
| Any national rheumatology COVID-19 registry in your country? |       |            |                |            |                |       |
| Yes                                  | 57 (13.2)      | 3 (7.0)    | 0 (0.0)        | 1 (5.0)    | 12 (22.2)      | 73 (13.2) |
| No                                   | 179 (41.5)     | 24 (55.8)  | 5 (83.3)       | 11 (55.0)  | 24 (44.4)      | 243 (43.8) |
| Not aware                            | 195 (45.2)     | 16 (37.2)  | 1 (16.7)       | 8 (40.0)   | 18 (33.3)      | 238 (43.0) |
continent to the collective needs for more Afrocentric rheumatology research activity. A limitation is the inability to calculate the response rate as the total number of individuals reached could not be verified. In conclusion, COVID-19 has caused significant changes to rheumatology practice across Africa. In the midst of new challenges and responsibilities, there is a need to bridge identified regional and national disparities, improve service delivery, increase telemedicine usage, encourage collaborative research and take advantage of the pandemic to positively reshape African rheumatology.

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Supplementary data
Supplementary data are available at Rheumatology online.

References
1 Mody GM. Rheumatology in Africa—challenges and opportunities. Arthritis Res Ther 2017;19:49.
2 Dumusc A, Dan D. Rheumatology and COVID-19. Rev Med Suisse 2020;16:831–4.
3 Cai K, He J, Wong PK, Manolios N. The impact of COVID-19 on rheumatology clinical practice and university teaching in Sydney, Australia. Eur J Rheumatol 2020;7:591–3.
4 Landewé RB, Machado PM, Kroon F et al. EULAR provisional recommendations for the management of rheumatic and musculoskeletal diseases in the context of SARS-CoV-2. Ann Rheum Dis 2020;79:851–8.
5 Mikuls TR, Johnson SR, Fraenkel L et al. American College of Rheumatology guidance for the management of rheumatic disease in adult patients during the COVID-19 pandemic: version 1. Arthritis Rheumatol 2020;72:1241–51.
6 Tam L-S, Tanaka Y, Handa R et al. Care for patients with rheumatic diseases during COVID-19 pandemic: a position statement from APLAR. Int J Rheum Dis 2020;23:717–22.
7 Australian Rheumatology Association. Advice for GPs and Other Health Professionals Caring for Patients with Rheumatoid and Other Inflammatory Arthritis, Systemic Lupus Erythematosus and Other Autoimmune Diseases in the COVID-19 (Coronavirus) Pandemic. 2020. https://rheumatology.org.au/gps/documents/20200420%20Advice%20for%20GP%20AHP%20caring%20for%20patients%20with%20Rheumatic%20Disease%20%2014Apr20.pdf (26 June 2020, date last accessed).
8 Eysenbach G. Improving the quality of Web surveys: the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). J Med Internet Res 2004;6:e34.
9 Scott C, Webb K. Paediatric rheumatology in sub-Saharan Africa. Rheumatology 2014;53:1357–8.
10 BBC. Coronavirus in Africa tracker. 2020. https://www.bbc.co.uk/news/resources/idt-4a11d568-2716-41cf-a15e-7d15079548bc (28 July 2020, date last accessed).
11 Misra DP, Agarwal V, Gasparayan AY, Zimba O. Rheumatologists’ perspective on coronavirus disease 19 (COVID-19) and potential therapeutic targets. Clin Rheumatol 2020;39:2055–62.
12 Kulcsar Z, Albert D, Ercolano E, Mechella JN. Telerheumatology: a technology appropriate for virtually all. Semin Arthritis Rheum 2016;46:380–5.
13 Fredi M, Cavazzana I, Moschetti L et al. COVID-19 in patients with rheumatic diseases in northern Italy: a single-centre observational and case-control study. Lancet Rheumatol 2020;2:e549–56.
14 Favalli EG, Ingegnoli F, Cimaz R, Caporali R. What is the true incidence of COVID-19 in patients with rheumatic diseases? Ann Rheum Dis 2020. doi: 10.1136/annrheumdis-2020-217615.
15 Favalli EG, Agape E, Caporali R. Incidence and clinical course of COVID-19 in patients with connective tissue diseases: a descriptive observational analysis. J Rheumatol 2020;47:1296.
16 Gianfrancesco M, Hyrich KL, Al-Adely S et al. Characteristics associated with hospitalisation for COVID-19 in people with rheumatic disease: data from the COVID-19 Global Rheumatology Alliance physician-reported registry. Ann Rheum Dis 2020;79:859–66.
17 Perricone C, Triggianese P, Bartolini E et al. The antiviral facet of anti-rheumatic drugs: lessons from COVID-19. J Autoimmun 2020;111:102468.
18 Ferro F, Elefante E, Baldini C et al. COVID-19: the new challenge for rheumatologists. Clin Exp Rheumatol 2020;38:175–80.
19 Mikuls TR, Johnson SR, Fraenkel L et al. American College of Rheumatology guidance for the management of adult patients with rheumatic disease during the COVID-19 pandemic. Arthritis Rheumatol 2020;72:1241–51.
20 Landewé RB, Machado PM, Kroon F et al. EULAR provisional recommendations for the management of rheumatic and musculoskeletal diseases in the context of SARS-CoV-2. Ann Rheum Dis 2020;79:851–8.
21 Wallace ZS, Bhana S, Hausmann JS et al. The Rheumatology Community responds to the COVID-19 pandemic: the establishment of the COVID-19 global rheumatology alliance. Rheumatology 2020;59:1204–6.
22 Robinson PC, Yazdany J. The COVID-19 Global Rheumatology Alliance: collecting data in a pandemic. Nat Rev Rheumatol 2020;16:293–4.