Background: The COVID-19 pandemic has disrupted healthcare delivery and education of physicians, including rheumatology trainees.

Objectives: To assess the impact of the COVID-19 pandemic on the clinical experiences, research opportunities, and well-being of rheumatology trainees.

Methods: A voluntary, anonymous, web-based survey was administered in English, Spanish, or French from 19/08/2020 to 05/10/2020. Adult and paediatric rheumatology trainees worldwide in training in 2020 were invited to participate via social media and email. Using multiple choice questions, Likert scales, and free text answers, we assessed trainee patient care activities, redeployment, research, and well-being.

Results: The 302 respondents were from 33 countries, with most (83%, 252/302) in adult rheumatology training. Many trainees (45%, 135/300) reported an increase in non-rheumatology clinical work (e.g. care of COVID-19 patients), with 52% of these (70/135) also continuing rheumatology clinical work. COVID-19 redeployment was not optional for 68% (91/134).

Trainees reported a negative impact of the pandemic in their growth in rheumatology (Figure 1). They also reported a substantial impact on several training areas: outpatient clinics (79%, 238/302), inpatient consultations (59%, 177/302), formal teaching (55%, 167/302), procedures (53%, 147/302), teaching opportunities (52%, 157/302), and ultrasonography (36%, 110/302), with 87-96% perceiving a negative impact on these areas. Only 54% (159/294) reported feeling comfortable with their level of clinical supervision during the pandemic (Figure 1). Many trainees (46%, 128/280) reported changes in research experiences during the pandemic; 39% (110/285) reported that COVID-19 negatively affected their ability to continue their pre-pandemic research and 50% (142/285) reported difficulty maintaining research goals (Figure 1).

Some rheumatology trainees reported having health condition(s) putting them at high risk for COVID-19 (10%, 30/302) and 14% of trainees (41/302) reported having had COVID-19 (Table 1). Only 53% (160/302) reported feeling physically safe in the workplace while 25% (76/302) reported not feeling physically safe; reasons included lack of training about COVID-19, lack of comfort in the clinical setting, insufficient personal protective equipment, immunocompromised state, and pregnancy. Half (151/302) reported burnout and 68% (204/302) an increase in stress from work during the pandemic (Figure 1), whilst 25% (75/302) reported that changes to their training programme negatively impacted their physical health.

Conclusion: The COVID-19 pandemic has negatively impacted the experience of rheumatology training as well as the well-being of trainees globally. Our data highlight concerns for rheumatology trainees including research opportunities and clinical care which should be a focus for curriculum planning.

Figure 1. Rheumatology trainee perceptions of pandemic impact and changes in training programme.

Table 1. Rheumatology trainees reporting health vulnerabilities or having acquired COVID-19. Data is presented as n (%). Rest of the world (ROW) data includes the United States (116), Asia (50), Central and South America (23), Canada (12), Australia (8), and Africa (4).

	Europe n = 89	ROW n = 213	Combined n = 302
Disability	1 (1)	9 (4)	10 (3)
High risk	7 (8)	23 (11)	30 (10)
Pregnant	4 (5)	15 (7)	19 (6)
Shielding/Quarantining	12 (13)	70 (33)	82 (27)
Acquired COVID-19	20 (22)	21 (10)	41 (14)

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POS0052

PATHOPHYSIOLOGY OF ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2 INFECTION: A SYSTEMATIC LITERATURE REVIEW TO INFORM EULAR POINTS TO CONSIDER

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Background: The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is a global health problem. Beside the specific pathogenic effect of SARS-CoV-2, incompletely understood deleterious and aberrant host immune responses play critical roles in severe disease. Rheumatologists have the best experience of studying and treating these complicated hyperinflammatory processes.

Objectives: To summarize the available information on pathophysiology of COVID-19.

Methods: As part of a EULAR taskforce, two systematic literature reviews were performed one on pathophysiology and one on immunomodulatory therapies. Two reviewers independently identified eligible studies according to the following PICO framework: P (population): patients with SARS-CoV-2 infection; I (intervention): any intervention/no intervention; C (comparator): any comparator; O (outcome) any clinical or serological outcome including but not limited to immune cell phenotype and function and serum cytokine concentration. The results pertaining to pathophysiology of COVID-19 are presented here.

Results: Of the 55496 records yielded, 85 articles were eligible for inclusion. Included studies were at variable risk of bias and exploring various aspects of disease pathogenesis from immune to non-immune cells (Table 1). Pro-inflammatory cytokines' expression including IL-6, was increased, especially in severe COVID-19, although not as high as other states with severe systemic inflammation. Innate and adaptive immune cell compartments were differentially affected by SARS-CoV-2 infection: neutrophils displayed an immature differentiation state and also increased neutrophil extracellular traps (NETs) formation. Dendritic cell number was reduced and classical monocytes was increased although displaying a reduced expression of HLA-DR. The lymphoid compartment was also affected: lymphopenia was present with a reduced number of CD4+ and CD8+ T lymphocytes and more frequent PD1+CD8+ T cells corresponding to an exhausted phenotype. Antibody response to SARS-CoV-2 infection showed a high variability across individuals and disease spectrum. Multiparametric algorithms showed variable diagnostic performances in predicting survival, hospitalization, disease progression or severity, and mortality. Differences in SARS-CoV-2 manifestations in adults and children were highlighted.

Conclusion: Overall, SARS-CoV-2 infection affects both innate and adaptive immune responses in a variable way, according to both disease severity and individual parameters. This SLR informs the EULAR points to consider on pathophysiology and use of immunomodulatory therapies in COVID-19.

Table 1. Studies on SARS-CoV-2 infection pathogenesis

Research question	N
Cytokines profile	7
Immune profile	18
Algorithm	17
Children	3
Comorbidities	1
Endothelial dysfunction and platelets	8
Gut and microbiota	3
Genetics and variants	8
Histology	7
Antibodies profiles	8
Viral load and immune response	4
Interferon	3
Immunosuppression	3
Total	90*

*Some manuscripts were including in several research questions. Total number of studies included n=85.

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POS0053

RHEUMATOID ARTHRITIS AND THE RISK OF COVID-19 DIAGNOSIS, HOSPITALISATION AND DEATH: A POPULATION-BASED MULTI-STATE COHORT ANALYSIS INCLUDING 5,586,565 PEOPLE IN CATALONIA, SPAIN

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Background: The COVID-19 pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus is of particular concern for people with rheumatoid arthritis (RA), with concerns that these people may be at higher risk and have poorer outcomes. However, at present the implications of COVID-19 for people with RA remain poorly understood.

Objectives: To investigate the associations between rheumatoid arthritis and the risk of COVID-19 diagnosis, hospitalisation with COVID-19 and COVID-19-related death.

Methods: A population-based cohort study including all individuals registered in the Information System for Research in Primary Care (SIDIAP). SIDIAP includes primary care records covering over 80% of the population of Catalonia, Spain, and was linked to region-wide SARS-CoV-2 PCR testing, hospital and mortality records. Outpatient diagnoses of COVID-19, hospitalisations with COVID-19 and deaths with COVID-19 were identified as study outcomes between 1st March and 6th May 2020. A multi-state model was used, with cause-specific Cox survival models estimated for each transition, adjusted for age and sex.

Results: A total of 5,586,565 individuals were identified in SIDIAP as of the 1st March 2020, of which 16,344 had RA. RA patients were median (IQR) 63 years (52.0, 74.0) and the majority (n=11,727, 71.8%) were female. Having RA was positively associated with being diagnosed with COVID-19 (adjusted HR 1.14 (1.03 to 1.28)), with hospitalisation with COVID-19 (HR 1.66 (1.35 to 2.04)). However, we did not find an association between RA status and the risk of worsening from outpatient diagnosis to hospitalization or death, or from hospitalization to death (see Table 1).

Table 1. Estimated hazard ratios, adjusted for age and gender, for individuals with rheumatoid arthritis

Transition	Study population (RA), n	Total events (RA), n	Hazard Ratios (95% Confidence Intervals)
From general population to diagnosed with COVID-19	5,586,565 (16,344)	88,396 (324)	1.14 (1.03 to 1.28)
From general population to hospitalised with COVID-19	5,586,565 (16,344)	10,143 (90)	1.66 (1.35 to 2.04)
From diagnosed with COVID-19 to hospitalised with COVID-19	88,396 (324)	5,946 (30)	0.95 (0.66 to 1.36)
From diagnosed with COVID-19 to death	88,396 (324)	2,295 (16)	0.96 (0.58 to 1.56)
From hospitalised with COVID-19 to death	16,089 (120)	2,602 (27)	1.13 (0.77 to 1.64)

Conclusion: To our knowledge, this is the largest study performed to date looking at COVID-19 outcomes in RA patients. Individuals with RA were found to have an increased risk of COVID-19 diagnosis and hospitalisation with COVID-19, compared to the general population. Further research is needed to address factors associated with this including the presence of other co-morbidities, underlying RA disease activity and the use of immunosuppressive medications.

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POS0054

THE IMPACT AND OUTCOME OF COVID-19 ON SYSTEMIC SCLEROSIS PATIENTS FROM THE EUROPEAN SCLERODERMA TRIAL AND RESEARCH GROUP (EUSTAR)

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Background: Coronavirus disease-19 (COVID-19) has been a major clinical challenge worldwide. Sex, age and comorbidities have been associated with worse outcome in the general population. Systemic sclerosis (SSc) is a severe, autoimmune disease with frequent multi-organ involvement.

Objectives: To assess the impact of COVID-19 and to determine factors associated with worse outcome in SSc patients from the European Scleroderma Trial and Research (EUSTAR) database.

Methods: SSc patients from the EUSTAR database with COVID-19 were prospectively collected between 15.03.-31.12.2020. Two outcomes were chosen: (1) hospitalization; and (2) severe outcome defined as either non-invasive ventilation, mechanical ventilation/extracorporeal membrane oxygenation (ECMO) or death. General risk factors assessed were sex, age and number