Title: Results from the 2020 Canadian Rheumatology Association’s Workforce and Wellness Survey

Running Head: Rheumatology Workforce and Wellness

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Abstract (248/250)

Objectives: The Canadian Rheumatology Association (CRA) launched the Workforce and Wellness Survey to update the Canadian rheumatology workforce characteristics.

Methods: The survey included demographic and practice information, pandemic impacts, and the Mini-Z questionnaire to assess burnout. French and English survey versions were distributed to CRA members electronically between 10/14/2020-3/5/2021. The number of full-time equivalent (FTE) rheumatologists per 75,000 population was estimated from the median proportion of time in clinical practice multiplied by provincial rheumatologist numbers from the Canadian Medical Association (CMA).

Results: Forty-four percent (183/417) of the estimated practicing rheumatologists (149 adult; 34 pediatric) completed the survey. The median age was 47 years, 62% were female, and 28% planned to retire within the next 5-10 years. Respondents spent a median of 65% of their time in clinical practice. FTE rheumatologists per 75,000 ranged between 0 and 0.70 in each province/territory and 0.62 per 75,000 nationally. This represents a deficit of 1 to 78 FTE rheumatologists per province/territory and 194 FTE rheumatologists nationally to meet the CRA's workforce benchmark. Approximately half of survey respondents reported burnout (51%). Women were more likely to report burnout (OR 2.86, 95%CI: 1.42-5.93). Older age was protective against burnout (OR 0.95, 95%CI: 0.92, 0.99). As a result of the pandemic, 97% of rheumatologists reported spending more time engaged in virtual care.

Conclusions: There is a shortage of rheumatologists in Canada. This shortage may be compounded by the threat of burnout to workforce retention and productivity. Strategies to address these workforce issues are urgently needed.

Introduction

There is currently an estimated shortage of rheumatologists in many Canadian regions according to a 2015 Canadian Rheumatology Association (CRA) survey¹. This shortage is projected to worsen as one third of surveyed rheumatologists were planning to retire in the next 5-10 years¹. Moreover, the demographics of the workforce are changing with females and millennials (born between 1981-1996) now comprising a larger proportion of the workforce²⁻⁴. As gender and age impact practice volumes, and these factors have further implications^{1-3,5}.

While not addressed in the 2015 Canadian rheumatologist survey, physician burnout is increasingly recognized as a threat to workforce retention, care quality, and productivity⁶⁻¹¹. In the United States, recent reports indicate high levels of burnout among rheumatology practitioners^{12,13}. While burnout is prevalent among Canadian physicians¹⁴, little is known about burnout in Canadian rheumatologists.

The challenges of an existing rheumatologist workforce shortage, changing workforce demographics, and physician burnout have been compounded by the COVID-19 pandemic. The pandemic had many impacts on rheumatology outpatient care, most notably a rapid increase in virtual care^{15,16}. Despite the increase in virtual care, in many regions there may still have been reduced access to rheumatology care. Reasons for this include clinic closures, limits on in-person visit numbers for health and safety reasons, recruitment of rheumatologists to work on COVID-19 wards, and reduced capacity for rheumatology outpatient care. It is also unknown what effect, if any, the pandemic had on physician retirement plans.

The CRA Human Resources (HR) Committee launched the Rheumatology Workforce and Wellness Survey to address the following objectives: 1) describe demographic and practice

characteristics including retirement plans of the rheumatology workforce, 2) estimate the current number of adult and pediatric clinical full time equivalent rheumatologists per 75,000 population, 3) assess burnout of the rheumatology workforce, and 4) understand the impact of the pandemic on rheumatologist's practices.

Materials and Methods

Survey Development: This survey was conducted by the CRA's HR Committee and developed based on the CRA's 2015 workforce survey¹. Many questions were retained to allow for comparisons over time. Questions that were not relevant or have been recently explored elsewhere were excluded. In this iteration, we included the Mini-Z survey to measure burnout¹⁷. The survey was initially planned for launch in the spring of 2020 but was delayed because of the COVID-19 pandemic. Subsequent modifications were made to explore how the COVID-19 pandemic affected work patterns. A draft survey was then circulated to the CRA HR Committee for input. This committee includes adult, pediatric, community- and university-based rheumatologist, researchers, CRA staff, representation from allied health professionals, and a rheumatology resident. The survey consisted of 26 questions and was pilot tested by 8 committee members. The English survey was translated to French by a professional translator and re-piloted by a bilingual member.

Survey Dissemination: The survey was distributed electronically to all CRA members on October 14, 2020, and closed March 5th, 2021. To maximize participation, 4 electronic reminders and 8 reminders in the "President's Update" newsletter were sent by email. The

survey was promoted at the CRA Annual Scientific meeting; advertised on the CRA and ORA websites and in membership communications; and promoted at regional rheumatology rounds.

Data Profile on the Number of Rheumatologists in Canada.

The number of expected rheumatologists in Canada were ascertained from the Canadian Medical Association (CMA) Masterfile¹⁸. The CMA conducts an annual survey of active physicians in Canada. The CMA annual physician count excludes medical residents and physicians over age 80 and includes non-clinicians and physicians who work primarily in administrative positions, who maintain a license to practice, as well as part-time and semi-retired physicians. The CMA Masterfile is an original CMA database that receives data from the Royal College of Physicians and Surgeons in Canada, the College of Family Physicians of Canada, Collège des Médecins du Québec, and from its own members. The CMA Masterfile does not report number of adult versus pediatric rheumatologists separately.

Analysis:

To maintain the privacy of individual respondents, cells sizes of ≤ 6 are not displayed and/or data are aggregated. In the case of incomplete data, the denominator is displayed (n). Statistical significance was accepted at $p\text{-value} \leq 0.05$. Analysis was conducted in R (R Core Team, 2019)¹⁹. Descriptive statistics including mean and standard deviation or median and interquartile range were used depending on data normality. Information about practice characteristics included time worked; numbers of new patients and follow ups seen; on-call roster participation; and delivery of care services using virtual or travelling clinics. Respondents were asked for their impression on whether the COVID-19 pandemic resulted in higher, lower, unchanged estimates

for each variable. Content analysis²⁰ was used to analyze the responses to an open-ended question about the effects of the COVID-19 pandemic on burnout and work practices.

The Mini-Z is a 10-item survey that uses 3 questions to measure satisfaction, stress, and burnout and 7 questions to measure their risk factors (also sometimes called drivers)¹⁷. The single item burnout question was used to measure burnout. The item was dichotomized for analysis with scores of 1-3 indicating burnout and 4-5 indicating absence of burnout. This has been validated against the emotional exhaustion component of the Maslach Burnout Inventory (MBI)²¹. Burnout results were reported for demographic groups (gender, ethnicity, age, career stage, and type of practice). Group differences were assessed using univariable logistic regression models. Results are presented as odds ratios (OR) with 95% confidence intervals. Multivariable regression analysis was performed to identify demographic (gender, age, ethnicity) and workplace variables (practice setting and hours worked per week) as predictors of burnout. Selection of predictor variables was informed by existing literature.

The clinical FTE was estimated based on percentages of time allocated to clinical practice (grouping together time spent in virtual and/or in-person care and removing estimates of time for research, administration, and teaching) and applied to the number of rheumatologists practicing in each province according to data from the CMA Rheumatology Profile (2019)¹⁸. This was then used to estimate the number of FTE rheumatologists (adult and pediatric considered together) per 75,000 population based on population data from Statistics Canada. We then determined the deficit of FTE rheumatologists required to meet the target of 1:75,000 population. This is a threshold recommendation by the CRA HR committee and has been endorsed nationally²². We mapped the current number and deficit of FTE rheumatologists in each province using ArcGIS version 10.8 ESRI Inc.

Ethics: Ethics was approved by the University of Calgary (Ethics ID: REB19-1287) and all participants provided consent. The CRA HR committee approved the survey and the final manuscript.

Results

Response rates

Supplemental Figure A shows survey response rates. The survey was sent to 599 CRA members. CRA membership data estimates 417 practicing rheumatologists (354 adult and 63 pediatric rheumatologists). There were 218 valid responses and of these 35 did not meet inclusion criteria (non-rheumatologists, retired rheumatologists, rheumatologists currently on leave, and rheumatology trainees) yielding a sample of 183 rheumatologists and a response rate of 44% of CRA's 417 practicing rheumatologist members.

Respondent characteristics

Table 1 depicts respondent characteristics. The median age was 47 years (IQR 40 – 60) and 21% were millennials. Nearly one third (28%) of respondents planned to retire in the next 5-10 years. Over half (62%) were female and 74% were white/Caucasian. The median age of female (47.5 years) rheumatologists was significantly younger than males (52.3 years, $p=0.028$).

Rheumatologists who self-identified as Black, Indigenous, and People of Colour (BIPOC) were significantly younger (45.1 years) than white/Caucasian rheumatologists (50.9 years, $p=0.019$).

Work characteristics

Table 2 depicts work characteristics. These varied by type of rheumatologist (adult or pediatric), practice setting (community- or university-based), and gender (female or male; see

Supplementary Table A). Adult rheumatologists allocated a median of 73% of their time to clinical practice, worked a median of 45 hours a week, and held a median of 6 half day clinics per week. They saw a median of 8 new patients and 45 follow up visits per week. Fifty-six percent participated in rheumatology on-call rosters. Pediatric rheumatologists allocated 60% of their time to clinical practice, worked 50 hours a week, and held a median of 3 half day clinics per week. They saw a median of 4 new patients and 18 follow ups per week. Eighty-two percent participated in pediatric rheumatology on-call rosters. Both adult and pediatric rheumatologists reported spending 10 hours per week on clinical paperwork. Nearly all rheumatologists (93%) were accepting new patients.

Most rheumatologists were affiliated with an academic centre or hospital (85% and 89% respectively), and 57% work in a university-based clinic. Rheumatologists in community-based clinics reported higher volumes of clinics as well as new and follow-up patients (Table 2). Rheumatologists in university-based clinics worked an average of 50 hours per week compared with 40 hours per week worked by community-based rheumatologists ($p<0.001$).

Women and men allocated roughly the same proportion of time to clinical practice (70% and 68% respectively). They both held a median of 6 half-day clinics per week. However, women saw fewer patients per week with a median of 6 new patients compared to 10 for men and 35 compared to 45 follow-ups (Supplementary Table A).

Impact of the Pandemic

Table 3 depicts rheumatologists' perceptions of the impact of the pandemic on their practices. Most rheumatologists (97% of respondents) reported spending more time engaged in virtual care,

less time providing in-person care (89%) and the same amount of time in research (74%), administrative (60%), and teaching (58%) activities. Over one-third of rheumatologists (37%) reported seeing fewer new patients and 25% reported fewer follow-ups per week despite holding the same number (61%) or more (21%) half-day clinics per week. Over half (53%) of rheumatologists reported spending more time on clinical paperwork per week. Telephone and video visits continued even after the peak pandemic shutdowns (Supplementary Table B).

Results from the open-text question about the impact of the pandemic were overwhelmingly negative. Many rheumatologists identified difficulties with virtual care, increased patient and physician stress in clinical practice, and increased workload (Supplementary Table C).

Burnout

Table 4 shows the prevalence and comparison of burnout by demographic characteristics. Over half (51%) of respondents reported burnout. Women were more likely to report burnout (OR 2.86, 95% CI 1.42, 5.93). Older age was protective against burnout, (OR 0.95 CI 0.92, 0.99 per year of age).

Drivers of burnout were examined by gender (Supplementary Table D) and by age (Supplementary Table E). Women were more likely (OR 2.89, 95% CI 1.26, 7.34) to report poor or minimal personal control over workload and of feeling a great deal of stress because of their job (OR 2.99, 95% CI 1.43, 6.55). Women were also less likely to perceive their workplace as supportive compared to men (OR 0.36, 95% CI 0.16, 0.79). Increasing age was associated with perceiving a supportive workplace (OR 1.05, 95% CI 1.02, 1.09 per year of age). Conversely, increasing age was associated with reporting a less manageable work pace and Electronic

Medical Record (EMR) stress (OR 0.92 95% CI 0.83, 0.99, per year of age). Older age was protective against an increased impact of the pandemic on burnout level (OR 0.96 95% CI 0.92, 0.99 per year of age).

Results of a multivariable logistic regression model considering age, gender, ethnicity, hours worked per week, and practice setting (university-based vs community) revealed female gender (OR 2.42, 95%CI: 1.07, 5.60; $p=0.035$) and younger age (OR 0.95, 95%CI: 0.92-0.99; $p=0.007$) were significant predictors of burnout (Table 5).

Rheumatologists per capita

The national estimate of the percent of time allocated to clinical work from the workforce survey was used to adjust the 2019 data on rheumatologist numbers per province from the CMA¹⁸ to estimate the number of clinical FTE rheumatologists (adult and pediatric considered together) per 75,000 population²² (Figure 1). We estimated between 0 and 0.70 FTE rheumatologists per 75,000 population in each province/territory and 0.62 per 75,000 across Canada. This represents a deficit of 1 to 78 FTE rheumatologists per province/territory and a total of 194 FTE rheumatologists needed in Canada to meet the CRA benchmark. Results of a sensitivity analysis considering an international benchmark of 2 rheumatologists per 100,000 population²³ identify an estimated deficit of 447 rheumatologists (Supplementary Table F and Supplementary Figure B).

Discussion

This workforce survey provides a timely update of the Canadian rheumatology workforce for use in planning, recruitment, and retention strategies. Our findings also provide physician perspectives on the pandemic impact. To our knowledge this is the first Canadian national rheumatology survey to address burnout. While the pandemic affected many of the workforce variables examined in this survey, there continues to be important workforce trends demonstrated, which may impact workforce capacity and access to care.

The survey results were used to generate an updated estimate on the overall national deficit of FTE rheumatologists. The current deficit is estimated at 194 rheumatologists using the benchmark of 1 FTE rheumatologist per 75,000 population. This is relatively stable compared to the previously reported deficit of 203 rheumatologists in 2015¹. These estimates are based on previous consensus-based recommendations that have been endorsed nationally but require additional validation²². In a sensitivity analysis, a benchmark of 2 FTE rheumatologists per 100,000 was examined to align with more recent published targets²³, identifying an estimated deficit of 447 rheumatologists. Regional workforce projections should be generated in future work accounting for population characteristics and other practice variables²⁴, which were not readily available for this study. The results remain aligned with international concerns for workforce shortages including in the United States in both adult²⁵ and pediatric rheumatology²⁶.

The results of our survey warn of an ongoing workforce shortage due to retirement and highlight the changing demographics of the workforce. Presently, 28% of the rheumatology workforce plans to retire between 2025-2030. This is comparable to the results from the 2015 survey, which reported 32% planned to retire between 2020-2025¹. The CMA¹⁸ reported 10 retirements over a 3-year period from 2016-2018. Although this data may not be complete, it suggests a discrepancy between retirement plans, and actual retirements. Current non-visa

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rheumatology trainee numbers from the Canadian Post MD Education Registry (CAPER)²⁷ indicate that in 2019-20 there were 88 current adult rheumatology trainees and 11 pediatric rheumatology trainees nationally with 32 adult and 3 pediatric rheumatology trainees completing training, it is likely it will take some time before the deficit is resolved. Furthermore, the female predominance of the Canadian rheumatology workforce is increasing as over half of Canadian rheumatologists are female²⁸ and between 56-68% of adult rheumatology trainees since 2015/16 are female²⁷. This feminization has significant implications for workforce supply given that women, on average, see fewer follow-up and new patients per week, and studies on physician billing support this finding^{3,4}. However, women rheumatologists do not work fewer clinical hours than males, and thus likely have different practice patterns including spending more time with patients. Patient outcomes may also be different based on physician gender²⁹ and a dedicated evaluation of this may be of future interest.

Our findings demonstrate ongoing differences in practice characteristics between community and university-based rheumatologist practices as clinical volumes are nearly double in the community compared to a university setting. This difference is likely due to increased teaching, research, and administrative demands in university-based settings and potential complexity of cases referred to university-based clinics. Similarly, adult rheumatology practices see higher volumes in part as most pediatric practices remain in university-based clinics. The present survey did not inquire about models of arthritis care involving other healthcare professionals in advanced practice roles as this was recently published nationally³⁰.

The pandemic had a predictable impact on rheumatologist work patterns. Most notably was the large increase in virtual care. Comparing to the 2015 survey, only 14% of respondents at that time participated in telehealth or e-consultation¹. Our results are aligned with findings from other

practices around the world, which also reported a large increase in virtual care^{15,16,31,32}.

Delivering care virtually allowed for provision of rheumatology care despite pandemic-related lock downs, although many reported that it was difficult to assess a patient's disease activity without being able to complete a physical exam in person¹⁶. Providers were more comfortable providing virtual care for patients with established, stable disease¹⁵.

Historically, rheumatology has been considered by many to be a relatively "happy specialty" and one that allows for a good work life balance. One study found that 92 percent of rheumatologists in the USA were satisfied with their job³³. Yet, this present survey shows that burnout is a significant issue with over half of rheumatologists reporting burnout. This is higher than the national (pre-pandemic) average of 30% reported in the CMA's National Physician Health Survey¹⁴. Although our findings are likely affected by the pandemic, this is the present reality, and it is anticipated that the pandemic will have a lasting effect on the workforce. Interestingly, Medscape, which had previously found rheumatologists to be among the happiest specialists, now reports that rheumatologist have the second highest level of burnout among 29 subspecialties^{11,13}. This survey goes on to identify administrative/bureaucratic tasks as the main source of burnout. While there have been some concerns reported with the methodology of the Medscape inquiry³⁴, the results echo a survey of rheumatologists on burnout that was conducted pre-pandemic in which 54% of rheumatologist reported burnout according to the MBI¹². Furthermore, in our study women were more likely to report burnout and both gender and age were significantly associated with burnout. We did not find ethnicity/race to be associated with burnout in our sample. This may be because the number of respondents was low or that there were unique challenges not addressed in the burnout questionnaires. In a large study from the United States physicians in minority racial/ethnic groups were less likely to report burnout

compared with non-Hispanic white physicians³⁵. In contrast higher burnout was reported in Canadian ethnic minority internal medicine residents during the pandemic compared to white residents³⁶. We did not examine resident burnout given low sample size. Burnout in rheumatology is poorly studied perhaps as it was historically not considered a significant issue. However, this work suggests potential workforce implications.

While this is the only national Canadian rheumatology survey of its kind, we recognize several limitations. Firstly, as the survey was only sent to CRA members, non-member rheumatologists did not have access unless they were ORA members and accessed it through the website. Unfortunately, there is no single comprehensive list of rheumatologists in Canada. Therefore, the CRA membership list was considered a reasonable sample for survey dissemination. This also created challenges for determining an appropriate denominator for our estimate of FTE rheumatologists. We elected to use the CMA masterfile as it is compiled from multiple sources and was used as well for our 2015 survey. However, it is possible there are inaccuracies in this data and a 2020 version was not available at the time of analysis. Additionally, the CMA numbers were pre-pandemic and would not have captured any changes to the workforce that were precipitated by the pandemic such as possible increased retirements. Given the incomplete response rate, generalizability may be a concern due to a higher representation of female respondents and higher numbers with academic affiliation in comparison to the CMA masterfile¹⁸. Indeed, female pediatric rheumatologists may see lower patient volumes affecting some overall estimates for example. Additionally, surveys may have a response bias such that respondents may have different characteristics compared to non-respondents. Respondents may also over or underestimate practice volumes and in future linkage to physician billing data would make for an interesting evaluation.

Furthermore, the accepted CRA benchmark of 1:75,000 was used for our calculations of rheumatologist deficits and as discussed above this is not a proven benchmark based upon population estimates of rheumatic disease prevalence and healthcare use. Lastly, the COVID 19 pandemic likely influenced several aspects of this survey. We attempted to quantify physician perception of the pandemic's impact but with many pandemic waves this was difficult. The survey was deployed just after the "first wave" in Canada and remained open many months to improve the response rate. Language in the survey questions such as "pre pandemic" and "peak pandemic" may have been difficult to interpret for survey respondents and may have influenced our results. It is possible that the pandemic resulted in higher reported rates of burnout than would usually be present in the workforce and that levels of pandemic related burnout varied by COVID19 case numbers and vaccine development and roll-out.

In conclusion, our findings highlight the ongoing shortage of rheumatologists in Canada and that this deficit will worsen without increasing new graduates to cover retirements. This problem may be compounded by the threat of burnout to the retention and the productivity of the current workforce. The pandemic created an immediate threat to the workforce by significantly impacting patient volume, likely affecting rheumatologist remuneration and contributing to delayed care. A further evaluation on the impact of the pandemic and on increasing virtual care on rheumatology practices and patient outcomes is warranted. Future advocacy and research efforts should also continue to evaluate the predictors of burnout among rheumatologists and to develop strategies to address burnout at local, regional, and national levels.

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Figure legends

Figure 1. Map of Canada depicting number of clinical Full Time Equivalent (FTE)-practicing rheumatologists per 75,000 population. See legend colours for number of clinical FTE rheumatologists per 75,000 population. The superimposed count on the provinces and territories represents the number of FTE rheumatologists required to meet the target of 1:75,000. FTE were estimated based on the national median reported time allocated to clinics from all respondents of the 2020 Workforce and Wellness survey and used to adjust the 2019 Canadian Medical Association numbers of rheumatologists in each province. YU: Yukon; NT: Northwest Territories; NU: Nunavut; BC: British Columbia; AB: Alberta; SK: Saskatchewan; MB: Manitoba; ON: Ontario; QC: Quebec; NL: Newfoundland and Labrador; PE: Prince Edward Island; NB: New Brunswick; NS: Nova Scotia.

Table 1. Characteristics of respondents to the Workforce Wellness survey. Values are n (%) unless otherwise specified.

Respondent Characteristics, n (%)	Total, Includes Adult and Pediatric Rheumatologists	Adult Rheumatologists	Pediatric Rheumatologists
Distribution by province of region	n ¹ = 183	n = 149	n = 34
British Columbia	28 (15)	23 (15)	5 (15)
Ontario	54 (30)	41 (28)	13 (38)
Quebec	21 (11)	17 (11)	4 (12)
Prairie Provinces ²	32 (17)	26 (17)	6 (18)
Atlantic Provinces ³	10 (5)	9 (6)	1 (3)
Location not specified	36 (20)	31 (21)	5 (15)
Years in practice	n = 170	n = 137	n = 33
≤ 5 yrs	38 (22)	36 (26)	2 (6)
6-10 yrs	29 (17)	19 (14)	10 (30)
11-20 yrs	50 (29)	38 (28)	12 (36)
21-30 yrs	25 (15)	19 (14)	6 (18)
31+ yrs	28 (16)	25 (18)	3 (9)
Median age	n = 149	n = 118	n = 31
Years (provincial range of median age)	47 (40 – 60)	46 (39 – 61)	48 (42 – 57)
Female	n = 172	n = 139	n = 33
Percent (provincial range of % female)	62 (48 – 100)	60 (35 – 100)	70 (62 – 100)
Race/Ethnicity	n = 167	n = 134	n = 33
White/Caucasian	123 (74)	98 (73)	25 (76)
BIPOC ⁴	41 (25)	33 (25)	8 (24)
Arab/West Asian	8 (5)	-	-
Black or Latin American	6 (4)	-	-
Indigenous	<6 (<3)	-	-
East Asian	10 (6)	-	-
South or Southeast Asian	14 (8)	-	-
Multiracial/Multiethnic	<6 (<3)	-	-
Other	<6 (<3)	<6 (<3)	<6 (<3)
Prefer not to disclose	<6 (<3)	<6 (<3)	<6 (<3)
Retirement plans	n = 170	n = 137	n = 33
Retire in 5 years	33 (19)	30 (22)	3 (9)
Retire in 10 years	14 (8)	10 (7)	4 (12)

Em dashes (-) indicate a cell size too small to report (n < 6). ¹n = total no, respondents for each question. ²Because of small cell sizes in some provinces, the prairie provinces were combined. The prairie provinces include Alberta, Manitoba, and Saskatchewan. ³Because of small cell sizes, aggregated data for the Atlantic provinces are reported. The Atlantic provinces include Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador. ⁴BIPOC refers to Black, Indigenous, and People of Colour. Table does not include rheumatology trainees, rheumatologists who do 100% research, rheumatologists on leave, or retired rheumatologists.

Table 2. Work characteristics. Values are median (interquartile range) unless otherwise specified.

Work Characteristics, Median (IQR)	Total	Adult	Pediatric
Practice setting, n (%)	n = 167	n = 135	n = 32
Solo community-based private practice	32 (19)	31 (23)	1 (3)
Group community-based private practice	36 (22)	34 (25)	2 (6)
Academic setting (University-based clinic)	96 (57)	67 (50)	29 (91)
Other	3 (2)	3 (2)	0 (0)
Allocation of time ^{1,2} , %			
Clinical (in-person + virtual)	n = 173	n = 140	n = 33
Academic setting	65 (35 – 85)	73 (30 – 90)	60 (50 – 70)
Private practice	90 (80 – 95)	90 (80 – 96)	-
In-person	n = 173	n = 140	n = 33
Academic setting	20 (10 – 45)	20 (8 – 47)	25 (20 – 45)
Private practice	20 (10 – 40)	20 (10 – 40)	30 (20 – 50)
Virtual	n = 173	n = 140	n = 33
Academic setting	25 (6 – 50)	25 (6 – 52)	20 (10 – 30)
Private practice	25 (10 – 50)	28 (10 – 50)	-
Research	5 (0 – 19)	1 (0 – 13)	10 (10 – 25)
Administration	5 (0 – 10)	5 (0 – 10)	10 (5 – 15)
Teaching	5 (0 – 10)	5 (0 – 10)	10 (5 – 18)
Other	0 (0 – 0)	0 (0 – 0)	0 (0 – 0)
Weeks worked per year	n = 134	n = 107	n = 27
Hours worked per week	48 (45 – 48)	48 (45 – 48)	48 (46 – 48)
Academic setting	n = 136	n = 109	n = 27
Private practice	50 (40 – 55)	45 (40 – 55)	50 (50 – 56)
Call participation, n (%) ³	n = 144	n = 116	n = 28
Rheumatology call participation ⁴	88 (61)	65 (56)	23 (82)
Internal medicine or pediatric call only	12 (8)	11 (9)	1 (4)
COVID-19 inpatient call participation	12 (8)	12 (10)	0 (0)
Days per year providing rheumatology on-call coverage ⁴	n = 87	n = 64	n = 23
Half-day clinics per week ⁵	56 (40 – 76)	45 (30 – 71)	70 (67 – 79)
New patients seen per week ^{5,6}	n = 136	n = 108	n = 28
Academic setting	6 (3 – 7)	6 (4 – 8)	3 (3 – 5)
Private practice	n = 131	n = 105	n = 26
Academic setting	6 (4 – 12)	8 (5 – 15)	4 (3 – 5)
Private practice	n = 75	n = 52	n = 23
Follow-up patients seen per week ^{5,6}	5 (3 – 8)	6 (3 – 10)	4 (3 – 5)
Academic setting	n = 54	n = 51	-
Private practice	11 (8 – 20)	11 (8 – 20)	-
Academic setting	n = 134	n = 109	n = 25
Private practice	40 (25 – 60)	45 (30 – 60)	18 (10 – 24)
Academic setting	n = 76	n = 54	n = 22
Private practice	30 (20 – 42)	35 (26 – 50)	19 (15 – 23)

Private practice	n = 56	n = 53	-
Hours spent per week on clinical paperwork	55 (40 – 77)	60 (40 – 80)	-
	n = 132	n = 107	n = 25
	10 (5 – 12)	10 (5 – 10)	10 (6 – 15)
Number of respondents reporting that they are currently accepting new patients, n (%)	n = 147	n = 119	n = 28
	137 (93)	110 (92)	27 (96)

Em dashes (-) indicate a cell size too small to report ($n < 6$). ¹11 participants were excluded because the total time allocations reported did not sum to 100%. ²19 participants did not indicate whether they worked in an academic setting or private practice. They are included in the Total, Adult Rheumatologist, and Pediatric Rheumatologist results and omitted from the Academic setting and Private practice results. ³Rheumatologists may be counted in multiple categories (e.g. rheumatology call participation and COVID-19 inpatient call participation) if they provided coverage for more than one category of call. ⁴Combination of those who participated in rheumatology alone or in rheumatology + a second roster. ⁵Rounded to the nearest whole. ⁶2 participants did not indicate whether they work in an academic setting or private practice. They are included in the Total, Adult Rheumatologist, and Pediatric Rheumatologist results and omitted from the Academic setting and Private practice results.

Table 3. Perceived impact of the pandemic on work characteristics. Values are n (%) unless otherwise specified.

Work Characteristics	Higher	Lower	Unchanged
Allocation of time, %			
Clinical, In-person, n = 158	10 (6)	141 (89)	7 (4)
Clinical, Virtual, n = 157	152 (97)	2 (1)	3 (2)
Research, n = 136	6 (4)	30 (22)	100 (74)
Administration, n = 134	49 (37)	5 (4)	80 (60)
Teaching, n = 137	10 (7)	48 (35)	79 (58)
Other, n = 56	7 (13)	3 (5)	46 (82)
Weeks worked per year, n = 148	50 (34)	18 (12)	80 (54)
Hours worked per week, n = 145	52 (36)	30 (21)	63 (43)
Call participation, n = 100			
Rheumatology call participation, n = 95	14 (15)	8 (8)	73 (77)
Internal medicine or pediatric call only, n = 69	15 (22)	4 (6)	50 (72)
Half-day clinics per week, n = 147	31 (21)	27 (18)	89 (61)
New patients seen per week, n = 148	18 (12)	55 (37)	75 (51)
Followup patients seen per week, n = 142	35 (25)	35 (25)	72 (51)
Hours spent per week on clinical paperwork, n = 142	75 (53)	4 (3)	63 (44)

This table includes adult rheumatologists, pediatric rheumatologists, and rheumatology trainees.

Table 4. Prevalence and comparison of burnout by demographic characteristics using Mini-Z single item metric of burnout.

Characteristic	n (%)	OR (95% CI)	p-value
Gender ¹	n = 140	2.86 (1.42, 5.93)	<i>p</i> = 0.004**
Male	18 (35)		
Female	53 (60)		
Ethnicity ²	n = 138	1.61 (0.74, 3.60)	<i>p</i> = 0.236
White/Caucasian	14 (42)		
BIPOC	57 (54)		
Age	n = 126	0.95 (0.92, 0.99)	<i>p</i> = 0.005**
Rheumatologist Type	n = 142	0.93 (0.41, 2.14)	<i>p</i> = 0.087
Adult	59 (52)		
Pediatric	14 (50)		
Practice Setting	n = 140	1.24 (0.63, 2.44)	<i>p</i> = 0.530
Community-based private practice	38 (56)		
Academic setting	44 (61)		
Hours worked per week	n = 127	1.00 (0.97, 1.03)	<i>p</i> = 0.941
Career Stage	n = 142	1.09 (0.55, 2.15)	<i>p</i> = 0.803
Early career (<=10 years)	29 (53)		
Established career (10+ years)	44 (51)		
Retirement	n = 137	0.48 (0.22, 1.01)	<i>p</i> = 0.055
Retiring in next 10 years	15 (38)		
Not retiring in next 10 years	54 (56)		

The Mini-Z burnout item was dichotomized with those indicating the presence of one or more symptoms of burnout grouped (scoring 1-3 on the item) and those indicating no symptoms of burnout grouped (scoring 4-5). ¹One respondent was omitted from analysis due to low cell count. ²Respondents who did not select White/Caucasian as their ethnicity were combined under the heading Black, Indigenous, People of Colour (BIPOC) due to low cell counts in non-White ethnic groups.

Table 5. Results from multivariable logistic regression model predicting rheumatologist burnout using the single item metric on the Mini Z survey.

	Estimate	Standard Error	Z value	Odds Ratio	95% CI	P value
Intercept	1.89	1.22	1.55	6.63	0.63, 77.8	$p = 0.120$
Gender	0.88	0.42	2.10	2.42	1.07, 5.60	$p = 0.035^*$
Age	-0.05	0.02	-2.71	0.95	0.92, 0.99	$p = 0.007^{**}$
Ethnicity	0.62	0.48	1.31	1.86	0.74, 4.83	$p = 0.192$
Practice setting ¹	0.34	0.45	0.76	1.41	0.59, 3.41	$p = 0.445$
Hours worked per week	-0.01	0.02	-0.58	0.99	0.96, 1.02	$p = 0.564$

In the multivariable model the following coding was used: gender (male=0, female=1); age (numeric), Ethnicity (Black, Indigenous, People of Color (BIPOC)=0, White/Caucasian=1); Practice Setting (Community=0, Academic=1), Hours Worked (numeric). Full model $p = 0.006^{**}$, effect size = 0.104.

* $p < 0.05$, ** $p < 0.01$. ¹Academic or community-based private practice

Map of Canada depicting number of clinical Full Time Equivalent (FTE)-practicing rheumatologists per 75,000 population

279x215mm (600 x 600 DPI)