The Mental Health of Medical Radiation Technologists in Canada

2021 SURVEY

CAMRT ACTRM

Canadian Association of Medical Radiation Technologists

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Executive Summary

Background: Research indicates that medical radiation technologists (MRTs) are subject to chronic stress in the workplace that can be emotionally draining and contribute to burnout and poor mental and physical health. Evidence suggests there is silence around mental health challenges and that stigma exists within the MRT community. This is especially important within the context of COVID-19, since MRTs may be experiencing higher levels of burnout, staffing shortages, a lack of personal protective equipment, unexpected redeployment, and a lack of sufficient resources to address these concerns individually and organizationally. There are presently no large-scale mental health studies examining the current and historical status of MRT mental health in Canada.

Purpose: This study used the 2021 National Mental Health Survey to gauge the current mental health of MRTs in Canada in the context of their work during the COVID-19 pandemic and compared it against baseline results obtained in 2018. More specifically, the study's purpose was to:

- determine the level of stress, burnout, mental health issues, and psychological distress within the profession (spectrum of mental health);
- determine the overall level of job satisfaction and quality of worklife; and
- identify any relationships between workplace characteristics and mental health indicators.

Methods: The online quantitative survey was available in French and English to approximately 12,000 to members of the CAMRT in 2018 and 2021. The survey was delivered by email and social media postings at each time point. The first portion of the survey focused on demographic characteristics. The second and larger section focused on the measurement of prevalence, degree of severity, and types of mental health challenges within the MRT population.

Results: Although there were differing participation rates in the 2018 and 2021 surveys (possibly due to the coronavirus pandemic), a consistent trend towards a decreased quality of worklife and increased mental health challenges were found across the majority of indicators. The data from 2021 further revealed the impact of the pandemic on MRTs, which has led to further burden, including:

- significant increase in workload;
- a lack of trust in management and worker safety;
- significant increase in MRT burnout in all three domains (increase in emotional exhaustion, depersonalization, and decrease in sense of personal accomplishment);
- lower mental health due to increased anxiety and depression, and diminished ability to control behaviours; and
- significant increase in MRTs showing signs of severe mental illness.

It is worth noting that these observations are consistent with the literature studying other health care professions working directly with patients during the pandemic.

Conclusion: Although society recognizes that MRTs play a critical role in healthcare, there is a lack of understanding about the impacts of those roles on the individuals themselves. Research has long examined the physical hardships and safety issues within the MRT profession, but only recently has the emerging mental health data begun to uncover the burden. MRTs have openly discussed these burdens in a small number of peer-reviewed articles, in part, perhaps due to the stigmatization around mental health.

The data from our two surveys (2018 and 2021) provide an interesting sampling of MRTs, both before and during a pandemic. Even pre-pandemic, it was noted that MRTs were exhibiting many signs of overwork, workplace, stress and burnout. The declines on almost all measures studied raise some alarms as the state of mental health in the MRT profession.

Taken together, we believe the data reported here highlights an unsustainable situation for both the professionals themselves and the system that relies so heavily on them.

CAMRT hopes these data will bring about greater awareness of this important issues, so that those facing mental health challenges can receive the support they deserve, and that strategies being built to recover from this pandemic consider the mental health burden on the professionals like MRTs that underpin the healthcare system.

Background

Research indicates that medical radiation technologists (MRTs) are subject to chronic stress in the workplace that can be emotionally draining and contribute to burnout and poor mental and physical health.[1–8] In a national mental health survey undertaken by the Canadian Association of Medical Radiation Technologists (CAMRT) and its partners in 2018, high levels of emotional exhaustion was experienced by more than 36% of MRTs.[9]

It is generally known that prolonged periods of employee burnout and poor mental health can have negative implications for healthcare workers, for patient care, and for the healthcare system itself. [7,18–21] Individuals suffering from burnout may experience depression, anxiety, weight gain, drug misuse, headaches, mood swings, insomnia, muscle tension, hypertension, gastrointestinal disorders or flu episodes, and even commit suicide.[1,10–12] Burnout among MRTs may also lead to decreased quality of patient care and potentially increase the likelihood of critical incidents due to a lack of adherence to practice guidelines or policies and procedures, communication errors, medical errors, poor patient outcomes, and issues associated with other safety metrics.[13–16] Employee burnout also has implications for the organization, including increased absenteeism, employee intention to leave the organization, low job satisfaction and low levels of employee commitment to the organization, reduced productivity, and increased medical expenses and compensation claims.[1,17]

In 2021, CAMRT released a position statement entitled, "Reducing the Prevalence of MRT Burnout"

Some aspects of the work involved in medical radiation technology may contribute to poor mental health. The literature identifies contributing factors such as the inherent stress of patient-facing roles caring for sick and injured people,[17] working in difficult emotional areas such as palliative care[1] and emergency departments, the introduction of new technologies,[1,2,6] and increased external control over health care organizations and services.[17] MRTs may also experience challenges in their mental health due to organizational factors such as lack of career progression,[22] poor management,[22] and poor working conditions.[2,23,24] Poor working conditions include staff shortages, increased workload, interpersonal challenges, unsupported technological advancements, and unreasonable demands. [2,23,24] In discussions with CAMRT members and stakeholders it was noted that the workload burden increased during the pandemic, such as the addition of enhanced cleaning protocols and social distancing requirements. Discussions with CAMRT members, stakeholders, and the CAMRT Mental Health Working Group have made it clear that MRTs are experiencing mental health challenges within the workplace. [1]

More research on the mental health of this professional population is needed to adequately address their mental health concerns. Evidence suggests that mental health silence and stigma are active within the MRT community.[25] This is especially important within the context of COVID-19, where MRTs may be experiencing higher levels of burnout, staffing shortages, lack of personal protective equipment availability, unexpected redeployment, and the lack of resources to address these concerns individually and organizationally.[26–30] Overall, a large number of Canadians (41%) have reported a decline in their

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[1] CAMRT is currently conducting a scoping review and qualitative focus groups and interviews as part of the Mitacs grant.

mental health since the onset of the pandemic.[31] It would stand to reason that MRTs are also experiencing more mental health challenges, which is in line with various pandemic-related studies in other healthcare groups. In a survey by Statistics Canada, one third of participating healthcare workers reported fair or poor mental health. Three quarters of healthcare workers working in direct contact with confirmed or suspected COVID-19 cases report worsening mental health.[32] Studies have found that healthcare professionals require tangible actions and visible leadership to address mental health challenge concerns within the workplace, particularly during these difficult times.[33]

Purpose

This study used the 2021 National Mental Health Survey to gauge the current mental health of MRTs in Canada in the context of their work during the COVID-19 pandemic and compare it against baseline results which were obtained in 2018. More specifically, the study's purpose was to:

- determine the level of stress, burnout, mental health issues, and psychological distress within the profession (spectrum of mental health);
- determine the overall level of job satisfaction and quality of worklife; and
- identify any relationships between workplace characteristics and mental health indicators.

Methods

This study was conducted as a follow-up to the National Mental Health Survey administered to CAMRT members in 2018. Referenced as the “2018 study” and “2018 data” within this report, that project was produced in conjunction with the Canadian Society for Medical Laboratory Science (CSMLS) and Sonography Canada (SC). The associated protocol was previously approved by the research ethics board for the study titled, “Gauging the Mental Health of Select Health Professions: Collecting Comparative Data” (CSMLS Research Ethics Board; CREB # 009). These organizations continue to partner with CAMRT on a larger mental health initiative. For the current study, referred to as the “2021 study” and “2021 data” in this report, CAMRT and the University of Ottawa received a Mitacs internship grant to assist with the administration of the second iteration of the survey to CAMRT membership. Research ethics board approval was obtained from the University of Ottawa Research Ethics Board (S-10-20-6094). The 2021 survey was administered online to MRTs throughout Canada using the same methodology as the 2018 study.

Survey Structure

The online quantitative survey was available in French and English to eligible participants. The first portion of the survey focused on demographic characteristics. The second section measured prevalence, degree of severity, and types of mental health challenges within the population.

The full National Mental Health Survey was constructed from several validated surveys, chosen to capture the spectrum of mental health (from mental wellbeing to mental illness). The following validated surveys were incorporated:

a) National Institute for Occupational Safety and Health (NIOSH) - Quality of Worklife Survey
b) Maslach Burnout Inventory – Human Services Survey
c) Mental Health Inventory
d) Kessler-6 Psychological Distress Scale

Participants

Eligible participants were recruited from the certified professional CAMRT membership, which represented approximately 12,000 MRTs from across Canada at each time point. Additional criteria for inclusion and exclusion included:

- must be certified in at least one of the four MRT disciplines (magnetic resonance, nuclear medicine, radiological technology, and radiation therapy),
- may be employed or unemployed at the time of completing the survey,
- must not be working outside of Canada,
- may have or have not experienced mental health challenges,
- must be 18 years of age or older, and
- must not be a student.

Participants were recruited using the organization's communication channels, including announcements in member newsletters, e-blasts, and social media. Recruitment for the two surveys (2018 and 2021) occurred between July 25 - August 23, 2018, and between March 29 - May 8, 2021, respectively.

Results

Sample Size

Table 1 describes the participation of CAMRT members in both the 2018 and 2021 surveys. It is apparent there was greater participation in the first iteration. Conducted during the COVID-19 pandemic, it was anticipated that the 2021 survey recruitment process would result in a lower participation rate given the dramatic changes to work and home life experienced across Canada and the world.[34–36] Therefore, a lower confidence interval or greater margin of error is expected for the 2021 results. It was determined this would be acceptable because the results are still likely to provide an important view of the mental health of MRTs during a pandemic.

Table 1: Sample Size

Year	Surveys Completed (partial or full)	Excluded Surveys	Total Participants (included in the analysis)	Confidence Interval	Margin of Error
2018	1956	53	1903	95%	2.5%
2021	755	7	748	95%	3.5%

For the purposes of this report, the statistical analysis of the National Mental Health Surveys will be limited to descriptive statistics since a more comprehensive analysis will be pursued in relation to a parallel qualitative project on the same topic.

Demographics

The demographic information received in both surveys is generally reflective of the MRT population and can be considered a good representation of CAMRT members and MRT professionals in Canada.

Table 2: Participants

	2018		2021	
Participants	Count	Percentage	Count	Percentage
Magnetic Resonance Technologist (RTMR)	145	8%	50	7%
Nuclear Medicine Technologist (RTNM)	193	10%	53	7%
Radiation Therapist (RTT)	148	8%	70	9%
Radiological Technologist (RTR)	1188	62%	488	65%
Combined Laboratory and X-Ray Technologist (CLXT)	16	1%	0	0%
Supervisor / Manager / Director / Clinical Specialist Radiation Therapist (CSRT)	139	7%	64	9%
Other	74	4%	23	3%
Total	**1903**	**100%**	**748**	**100%**

Mental health affects people of all ages, education, income levels, and cultures.[37] The survey collected data regarding age, gender, location of work, and employment status and is presented in Tables 3-6. Mental health challenges were found in each of these categories presented.

Table 3: Participation by Age

Age Category	2018	2021
19-24	5%	5%
25-29	13%	12%
30-34	13%	14%
35-39	12%	16%
40-44	10%	12%
45-49	11%	9%
50-54	15%	13%
55-59	11%	12%
60-64	7%	6%
65+	3%	2%

Table 4: Participation by Gender

	Gender				
Year	Female	Male	Self-Described	Prefer not to Disclose	Total
2018	1607 (84%)	279 (15%)	1 (>1%)	16 (1%)	1903
2021	654 (87%)	87 (12%)	6 (1%)	1 (>1%)	748

Table 5: Participation by Province/Territory of Work

Province/Territory	2018	2021
Alberta	21%	27%
British Columbia	14%	15%
Manitoba	8%	7%
New Brunswick	8%	8%
Newfoundland and Labrador	2%	2%
Northwest Territories	>1%	>1%
Nova Scotia	5%	7%
Nunavut	>1%	0%
Ontario	33%	25%
Prince Edward Island	1%	1%
Quebec	1%	>1%
Saskatchewan	6%	9%
Yukon	>1%	0%

Table 6: Participation by Employment Status

Year	Unemployed	Employed	Total
2018	41	1862	1903
2021	8	740	748
Total	**49**	**2602**	**2651**

Due to the small number of unemployed MRTs participating in the survey, the main analysis will focus solely on those who are employed.

Quality of Worklife

To better understand the workplace environment for MRTs, it is possible to examine some key considerations that are useful in assessing quality of worklife. Certain aspects of work, such as job security, workload, and likelihood to search for a new position indicate the level of employee job satisfaction. Table 7 displays these job satisfaction indicators for all participants.

Table 7: Job Satisfaction Indicators

	Job Satisfaction	
Question / Statement	2018	2021
How often are there not enough people or staff to get all the work done?	78% (sometimes to often)	84% (sometimes to often)
The job security is good	87% (somewhat true to very true)	89% (somewhat true to very true)
Taking everything into consideration, how likely is it you will make a genuine effort to find a new job	71% (not likely at all)	65% (not likely at all)

Between the two time periods, the perception of participants that there was insufficient staff to get their work completed increased. The values were quite high and signify an area of concern for MRTs. Even so, there was a decrease in the number of individuals making a genuine effort to find a new position in the next year and a relatively consistent perception that there was good job security in their employment (see Table 7). Given the pandemic status and associated workload changes for MRTs,[26,27] the workplace indicators described in this section could have been significantly different if obtained at a different time point during the pandemic. As such, these indicators are a snapshot in time and should not be considered a representation of perception throughout the pandemic.

In examining the quality of worklife of MRTs in Canada, Table 8 displays the percentage of participants who provided agreement (agree to strongly agree) with specific worklife statements. In only one statement, “My job lets me use my skills and abilities,” did the results remain consistent between surveys. Unfortunately, all other indicators showed a significant decrease in quality of worklife. Scores had a downward range of 6% to 10%. Of greatest concern are the scores associated with collegial interactions and workplace safety, as well as the perceived decrease in management concern for safety.

Table 8: Quality of Worklife Indicators

Quality of Worklife Indicators		Percent Agreement (Agree to strongly agree)	
Category	Statement	2018	2021
Workplace Duties	My job lets me use my skills and abilities	95%	95%
	I have too much work to do everything well	50%	60%
Collegial Interactions	At the place where I work, I am treated with respect	80%	74%
	I trust management at the place where I work	52%	44%
Safety	The safety of workers is a high priority with management where I work	67%	58%
	There are no significant compromises or shortcuts taken when worker safety is at stake	68%	59%

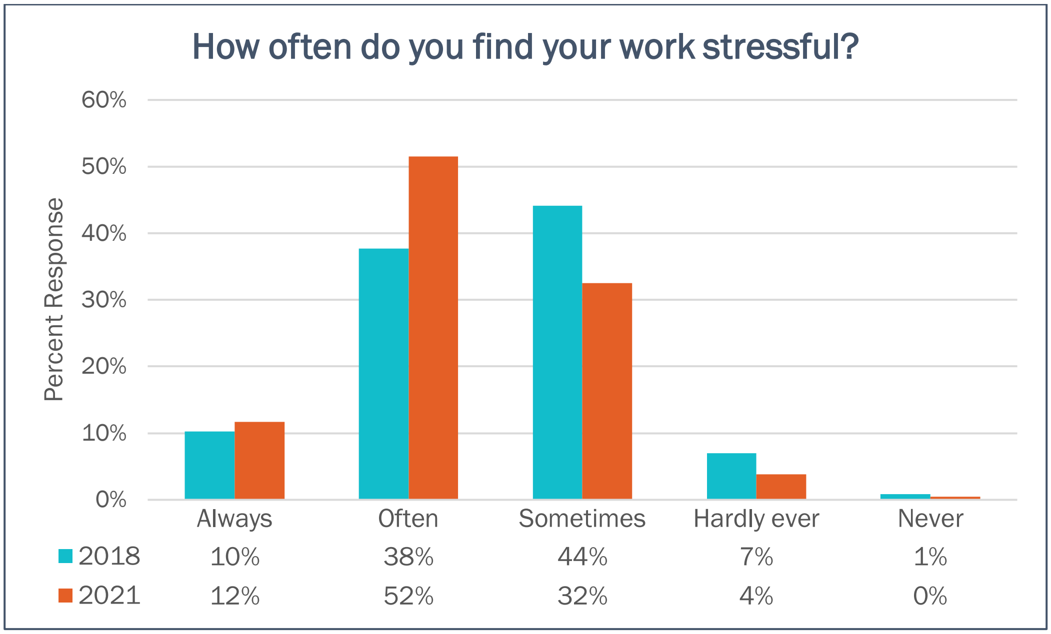
Survey participants were also asked if they had experienced any discrimination in the workplace. In 2018, 22% of respondents indicated they had experienced discrimination, and this was consistent with the 2021 results of 24%. This is a large number of MRTs who have experienced discrimination in the workplace, almost 1 in 4 participants. Although the survey did not determine the type of discrimination, gathering further information on the topic is warranted.

Overall, the job satisfaction and quality of worklife indicators suggest that, although many respondents had some job satisfaction issues at the time of the second survey, the majority of MRTs were not considering changing positions. Nor were they dissatisfied enough that job satisfaction outweighed maintaining their positions during the pandemic. There were significant decreases in the quality of worklife of MRTs in 2021 and that these lower results are to be expected given the working conditions.

Mental Health and Wellbeing

The relative stress level of MRTs has been documented in the literature as discussed in the background section of this report and will be further expanded on in CAMRT's parallel research projects. The current survey data provides further evidence that stress amongst MRTs is high. Graph 9 provides a visual representation that highlights the shift in stress across the two time periods and the trend towards more frequent feelings of stress in 2021. The percentage of respondents feeling stressed 'often' or 'always' jumped from 48% to 67% during the pandemic.

Graph 1: Stress Levels at Work



Although it is not surprising that Canadian MRTs are experiencing greater stress during a pandemic, as demonstrated by these stress values, as well as in other datasets reported in the healthcare setting, there was only a slight increase in the number of individuals aware of any access to stress management or stress reduction programs via their workplace. This is particularly concerning since many organizations and governments have encouraged greater use and access to mental health supports. In 2018, only 31% of CAMRT MRT professionals were aware they had access to such support, and this increased only slightly to 38% in 2021, meaning over the three-year period 62%- 69% of MRTs were either unsure of their ability to access such programs or did not have access. The lack of access and/or understanding of access would be important for MRT employers to consider in order to support the wellbeing of their employees.

It is well documented that unresolved stress can lead to burnout, and that the contributing factors to burnout have been mainly described as being occupational in origin (see Background section). Table 10 represents the Maslach Burnout Inventory scores of MRT respondents. This Inventory is recognized as the leading measure of burnout and is based on more than 25 years of research within and outside healthcare professions. The survey addresses three general subscales which, when combined, describe the construct of burnout:

- Emotional Exhaustion measures feelings of being emotionally overextended and exhausted by one's work.
- Depersonalization measures an unfeeling and impersonal response toward recipients of one's service, care treatment, or instruction.
- Personal Accomplishment measures feelings of competence and successful achievement in one's work.

Table 9: Burnout

Maslach Burnout Inventory - Human Services Survey	Percentage of Participants with High Burnout Score	
Category	2018	2021
Emotional Exhaustion	36%	64%
Depersonalization	16%	29%
Reduced Perception of Personal Accomplishment	19%	24%

The data demonstrates the number of MRTs experiencing high levels of burnout has significantly increased between 2018 and 2021. Emotional exhaustion grew by 78%, depersonalization increased by 81%, and reduced personal accomplishment grew by 26%. MRTs have clearly been negatively affected by the pandemic and their patient-facing roles within the healthcare system during this time have come at a personal cost to their mental wellbeing.

Mental Health Issues

As a part of the National Health Insurance Study, the Mental Health Inventory (MHI) is a method for evaluating mental health issues such as anxiety, depression, behavioral control, positive affect, and general distress. It has been shown to be significantly predictive of long-term sickness absence.[38] The mental health issues identified in the 2018 and 2021 surveys support the examination of mental health beyond wellbeing to provide a larger picture of the topic.

Table 10: Mental Health Issues

Mental Health Inventory	Score (1-100 scale)	
Category	2018	2021
Anxiety	73	68
Behaviour Control	77	60
Depression	84	75
Positive Affect	47	55

Note: Higher scores indicate better health (maximum score of 100).

Like the burnout subscales, the Mental Health Inventory categories demonstrate a consistent downward trend in mental health as experienced through increased anxiety and depression, and greater difficulty in controlling behaviour (regulation). Interestingly, positive affect (a participant's ability to show positive emotions and expressions) seemed to increase. Although the survey did not provide a specific indicator as to why this occurred, it can be hypothesized that the building of goodwill to support others during the pandemic may have helped MRTs become more aware of their positive affective traits.

Mental Health Illness

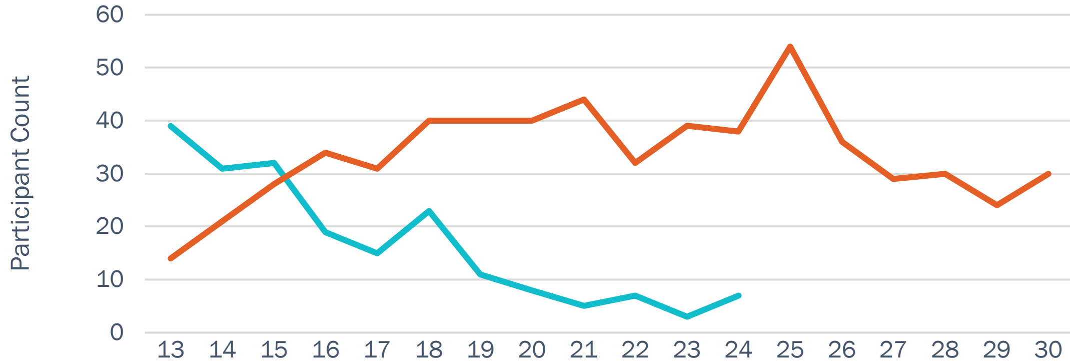
The Kessler Psychological Distress Scale (K6) was developed with support from the U.S. government's National Center for Health Statistics for use in the redesigned U.S. National Health Interview Survey (NHIS). The scale was designed to be sensitive enough to identify whether an individual is experiencing clinically significant distress in an effort to discriminate cases of severe mental illness from non-severe cases. Although the scale was not necessarily intended to establish a threshold for severe mental illness (score of 13 or greater) during a pandemic, the following results are offered with the caution that they should not be interpreted without consideration.

Table 11: Mental Health Illness

Kessler-6 Psychological Distress Scale	Percentage of Participants	
Category	2018	2021
Severe Mental Illness	11%	82%

Table 12 shows an alarming increase in the number of individuals demonstrating severe mental illness, with nearly 8 times more participants indicating scoring above the threshold between time periods.

Graph 2: Severe Mental Illness



	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
2018	39	31	32	19	15	23	11	8	5	7	3	7						
2021	14	21	28	34	31	40	40	40	44	32	39	38	54	36	29	30	24	30

Conclusion

This report presents a global view of MRT mental health, recognizing that, in any given year, 1 in 5 people in Canada will personally experience a mental health problem or illness.[37] Although society recognizes that MRTs and other healthcare professionals play a critical role, there is a lack of understanding about the impacts of those roles on the individuals themselves. Research has long examined the physical hardships and safety issues within the MRT profession, but it has only been recently that the emerging mental health data has begun to uncover the burden. MRTs have openly discussed these burdens in a small number of peer-reviewed articles, in part, perhaps due to the stigmatization around mental health.

CAMRT has undertaken two national surveys to break open the state of mental health in Canada with MRTs. These two surveys, spanning three years, provide the best sampling we have to date of mental health and wellness in the MRT workforce in Canada. The two surveys provide an interesting sampling of MRTs, both before and during a pandemic.

The investigators note that substantial difference in participation rate between the 2018 and 2021 surveys does raise the possibility of a participation bias, where those with mental health illness could have been more likely to complete the survey in 2021. One could expect that there should be a natural downward swing to the line graph in both years if it represented a normal distribution of mental illness. However, again, this considers a comparison to non-pandemic data rather than an alternative pandemic or major event (e.g., SARS).

Even pre-pandemic, it was noted that MRTs were exhibiting many signs of overwork, workplace, stress and burnout. Comparing the results on the two surveys, and knowing that the pandemic increased stress and workload for many MRTs in the vital medical imaging and radiation therapy services, it is not surprising to see indicators trend in the wrong direction (i.e., towards lower satisfaction, lower quality of worklife).

However, it is the ubiquity of the negative trend and the magnitude of some of the change that is cause enough for alarm. Of the dozens of measures reported herein, all worsened over the three-year period except for the sense of job security and the measure of positive affect. Measures of workload within these surveys all increased: 60% reporting they have too much work to do everything well (up from 50% in 2018) and 84% of respondents noting there are not enough people to accomplish the work (up from 78% in 2018). At the same time, 33% more MRTs are reporting stress in the workplace, with 64% now reporting feeling stressed often or all the time.

Burnout is linked to high levels of stress in the workplace, and so it is unsurprising to see the levels of professional burnout also rise. It also appears that the pandemic pushed substantial numbers of MRTs over a tipping point on measures of burnout and mental health and illness; there was a 78% jump in emotional exhaustion and 81% in depersonalization between the two surveys. It is alarming that now a wide majority of MRT respondents (64%) report high levels of emotional exhaustion (vs. a minority of 36% in 2018).

The level and the rise in mental health issues such as anxiety and depression and less ability to control one's behaviours, as well as the explosion of severe mental illness among MRTS as measured by these surveys is also cause for serious concern. In our consultation with the CAMRT Mental Health Working

Group, members were not surprised by the significant increase and stated that it was reflective of many workplace employees during the pandemic. While the ability of the scales (particularly the Kessler-6 scale) to distinguish clinical significance is uncertain under pandemic conditions, the results provide a possible indication that there is greater situation-specific mental health illness occurring among MRTs during the pandemic. Given the lower participation rates for the 2021 survey, we do note the possibility of participation bias which may affect the interpretation of these values.

Taken together, we believe the data reported here highlights an unsustainable situation for both the professionals themselves and the system that relies so heavily on them. Even if MRT workloads were to stabilize, the levels of stress, burnout, and mental health issues being experienced by a majority of MRTs already in Canada are likely to affect care in some way. Knowing that the recovery from the COVID-19 pandemic is likely to increase workload, rather than lead to a decrease, is further cause for concern.

These surveys also raise several important questions that warrant further investigation: “What is the cause of discrimination in the workplace?”; “How can organizations rebuild workforce trust after the pandemic?”; “How can we contribute to fight mental health stigmatization?”, “What are the best ways to advocate for mental health funding?”; and “What mental health best practice guidelines can be created for professionals?”

Whether through its membership, or through the association itself, the CAMRT is committed to supporting and facilitating further research into mental health. As well, although these studies were not designed to establish the linkage between workload and mental health issues like burnout, the correlation between the two trends is something we intend to investigate in future analyses of this data.

CAMRT hopes this data brings recognition and validation to those that are experiencing mental health challenges within the workplace. We ask that MRTs, management, organizations, and other stakeholders consider the results and take action to support the health of MRTs and break down the stigmatization of mental health. It is also the position of the CAMRT that any action taken to mitigate stress, burnout and mental health issues in this vital MRT workforce should consider the issue of workload that lies at the root. Conversely, as governments and healthcare decision-makers look to reduce wait lists in medical imaging and cancer care, it is imperative that the mental health and wellbeing of the professionals on which these services rely is considered in a meaningful way.