COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

COMP PROFESSIONAL REPORT 2020

1. Preamble

Information in this report was collected from all N = 787 COMP members through their membership profiles; apart from geographic location (by province), information was provided in an opt-in basis through their membership profiles. The number of respondents varies per each question as respondents were not obligated to answer every question. The date reflects the 2019 calendar year.

As an asterisk to this report, at the time of writing Canada and the rest of the world are in the midst of a global pandemic due to the coronavirus that causes COVID-19. Large scale responses initiated in approximately March of 2020 have included restrictions on non-essential cross-border travel, invocation of the national Quarantine Act, social distancing restrictions and major changes to routine operations in healthcare facilities. Responses listed in this report came during the membership renewal period, which began in late 2019. The majority of responses were filled out prior to the bulk of the major changes to routine operations in response to the pandemic.

2. Definitions

In this section terms are defined specifically as they were used in compiling and reporting the data in this report, in relation to the COMP membership and the Canadian medical physics workforce. Note that these definitions were not explicitly stated prior to collection of the survey data, so in some cases responses rely on common understanding of terms.

Administration	Defined for the purpose of compiling workforce activity data. Administrative tasks are NOT exclusive to managers or directors. They include: shipping & receiving, ordering equipment, writing reports, service on committees (not directly related to clinical, teaching or research), employer-supported service to COMP or other professional bodies, credential review, time tracking, etc.
Certified Medical Physicist (CMP)	For the purpose of compiling demographic data, COMP members reporting certification through Membership and/or Fellowship with the CCPM, and/or reporting certification through the ABR or ABMP (USA), ACPSEM (Australasian), IPEM (UK), and DQPRM (France) were tallied as Certified MPs. Retired members were omitted from this group so the CMP data reflected the workforce for the year. The term "CMP" is used as opposed to QMP (Qualified Medical Physicist) because grouping is based on self-reported certification.
Clinical Service	Defined for the purpose of compiling workforce activity data. Clinical service encompasses all activities a COMP member participates in that directly support clinical operations. This includes quality control measurements and assessment, commissioning of clinical devices, treatment planning-related

	activities, development of clinical programs and procedures, etc.
Director	Refers to an executive leadership position in a medical physics department. Tallied in response to individuals who identified as holding a position in the survey year of "Medical Physics Department Director or Lead."
Radiation Safety	Defined for the purpose of compiling workforce activity data. Radiation safety tasks are NOT exclusive to radiation safety officers. They include training, surveys, shielding design, radiation safety committee service, radiation safety procedure review, license applications, etc.
Research and Development (R&D)	Defined for the purpose of compiling workforce activity data. R&D is NOT exclusive to those with academic appointments. This includes time spent developing novel clinical procedures. Because most medical physics research is related to clinical service, the distinction between these is subject to the interpretation of individual members.
Teaching	Defined for the purpose of compiling workforce activity data. Teaching is NOT exclusive to those with academic appointments. This includes formal lecturing, but also includes time spent mentoring students or fellow employees, service on supervisory or examination committees, etc.

3. Demographics of the COMP Membership

3.1 Gender and Age Distribution

	all COMP	student	resident	associate	full	retired	CMP
N	590	100	13	12	419	13	365
female	28%	36%	46%	42%	26%	19%	27%
male	72%	64%	54%	58%	74%	81%	73%
median age (yrs)	42	28	35	43	45	72	44

Table 3.1. The tabulated gender distributions of the COMP membership, striated by membership type. Median ages of each group as of Dec. 31, 2019 are also included.

The gender distributions of the COMP membership and median ages are shown in table 3.1. Overall of the 590 members (all categories) reporting gender, 28.3% were female, 71.7% were male, and 0% reported other. The age distributions of the full member category, broken down for males and females are shown in figure 3.1. The median age of women is 42 years whereas for men it is 47 years and for all full members reporting age it is 45 years. The age distributions are similar when the data are restricted to those members reporting certification or CMPs with median ages of 42 for women, 45 for men and 44 inclusive of all CMPs reporting age.

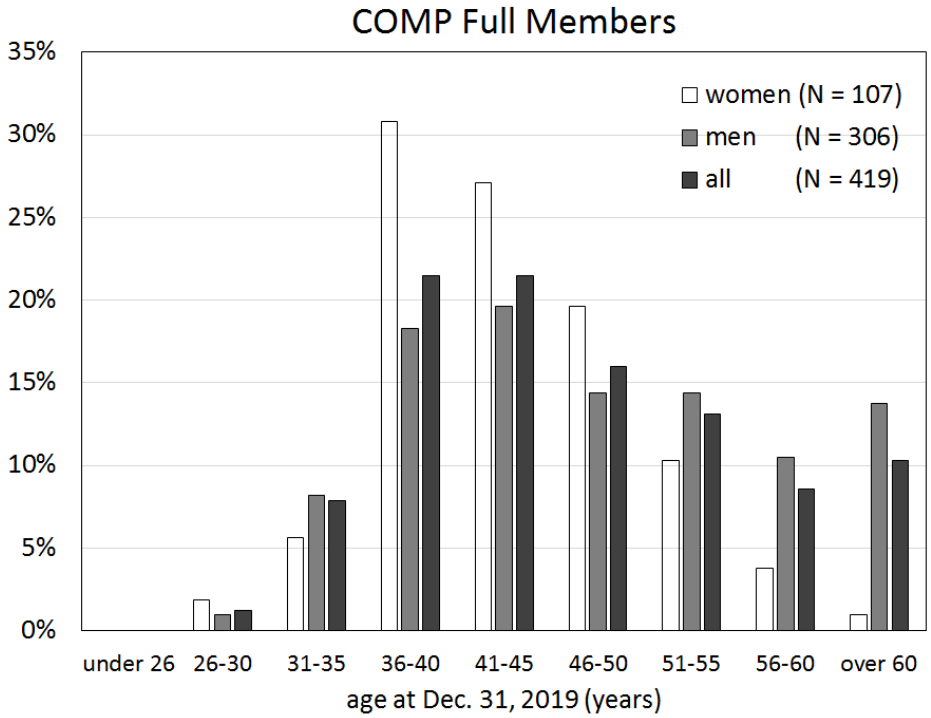

Figure 3.1. The age distributions of the COMP membership (full members), categorized by identified gender and for all genders.

The age distributions of the COMP membership (full members) are shown in figure 3.1. Distributions are also shown by gender. Specific percentages for full members and for CMPs are reported in table 3.2. Looking at full members of COMP, the mean age of women is 43.4 years whereas for men it is 48.1 years and overall it is 46.8 years. The age distributions are similar when the data are restricted to CMPs (those members reporting certification) with mean ages of 42.8 for women, 46.4 for men and 45.6 for all CMPs.

COMP Full Members

	under 26	26-30	31-35	36-40	41-45	46-50	51-55	56-60	over 60	N	mean
female	0.0%	1.9%	5.6%	30.8%	27.1%	19.6%	10.3%	3.7%	0.9%	107	43.4
male	0.0%	1.0%	8.2%	18.3%	19.6%	14.4%	14.4%	10.5%	13.7%	306	48.1
all	0.0%	1.2%	7.9%	21.5%	21.5%	16.0%	13.1%	8.6%	10.3%	419	46.8

COMP CMPs

	under 26	26-30	31-35	36-40	41-45	46-50	51-55	56-60	over 60	N	mean
female	0.0%	2.1%	10.4%	29.2%	26.0%	18.8%	9.4%	3.1%	1.0%	96	42.8
male	0.0%	2.7%	9.8%	19.7%	21.6%	13.3%	12.9%	10.6%	9.5%	264	46.4
all	0.0%	2.5%	10.4%	22.2%	22.7%	14.8%	11.8%	8.5%	7.1%	365	45.3

Table 3.2. The tabulated age distributions of the COMP membership—full members (top) and of certified members (bottom).

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

3.2 Geographic Distribution

The geographic distribution of the COMP membership is given in table 3.3. We have also tabulated the number of active COMP CMPs per province. No members reported residing in any of Canada's territories in 2019. Coupling these numbers with provincial data from Statistics Canada (Q4 2019, [https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901]), we also calculated the number of CMPs per hundred thousand people. Nationally, given a population of 37,797,496, the results of this survey would suggest there is roughly 1 working CMP per hundred thousand people in Canada (assuming that the vast majority of CMPs in Canada are accounted for in this survey). Cross referencing, the CCPM reported 490 members as clinically certified medical physicists for 2019. Naturally, some of these members work in the USA or elsewhere in the world, and some CMPs listed here have certification from other bodies.

	BC	AB	SK	MB	ON	QC	NB	NS	NL	PEI	USA	World	N
All COMP members	100	71	15	29	265	135	13	20	9	7	106	17	787
CMPs	58	35	10	8	144	75	11	12	7	4	75	12	451
CMPs per 100k Cdns	1.14	0.80	0.85	0.58	0.98	0.88	1.41	1.23	1.34	2.53	--	--	--

Table 3.3. The geographic distribution of the COMP membership, COMP CMPs and COMP CMPs per 100k people, by province. Nationally there is 1 CMP per hundred thousand people.

3.3 Education and Certification

The highest degree obtained as reported per membership category is listed in table 3.4. No members specifically reported having obtained a DMP as the highest degree. CAMPEP accreditation of the degree program was not factored into this analysis, nor was the field in which the degree was obtained. Just under half (47%) of student members report having obtained a doctorate, suggesting a substantial portion of Canadian medical physics students enter medical physics from other fields. Among CMPs just over 76% reported having earned a doctoral degree as the highest degree obtained.

	all COMP	student	resident	associate	full	retired	CMP
Bachelor	29	24	0	2	1	0	2
Master	129	25	2	2	51	2	47
Doctorate	414	44	14	6	182	8	160

Table 3.4. The highest degree obtained by COMP members, separated by membership category.

About 76% of COMP full members indicate having some professional certification. Of the 451 CMPs within the COMP community (inclusive over all memberships), 96% report membership with the CCPM (inclusive of those also reporting fellowship). For reference approximately 34% of CCPM members have also received the fellowship distinction. Additionally, 17% of certified members report certification through a body outside of the CCPM. Specific breakdown is shown in table 3.5.

certification	% of CMPs
CCPM membership	96%
ABR	14%
other	3%

Table 3.5. The types of professional board certification held by those members indicating any certification (N = 451).

3.4 Membership Type

The bulk of COMP membership in 2019 were comprised of full members. Of N = 742 cases, the membership breaks down as shown in table 3.6.

Membership Type	% of Members
Undergraduate/Graduate Student	17.0%
Resident/Postdoctoral Fellow	2.3%
Associate	2.0%
Full	75.6%
Retired	3.1%

Table 3.6. The types of professional board certification held by those members indicating any certification (N = 451).
*A subset of members reporting fellowship exclusively, likely also have CCPM membership, so this value is likely low.

4. Workforce Details the COMP Membership

4.1 Employer

A total of N = 593 members in the resident, associate, and full member groups reported a primary employer type and of those, N = 438 also reported certification. Student and retired members were excluded from this analysis. A breakdown of the primary employer type is given in table 4.1. Note that members could identify more than one option.

Employer	% of 'working' members N = 593	% of 'working' CMP members N = 438
Cancer Centre	44%	49%
Hospital	47%	54%
University	16%	16%
Government	6%	4%
Private	7%	6%
Other	1%	1%

Table 4.1 The primary employer of those COMP members who are not students or retired.

4.2 FTE Experience

In figure 4.2, we show the distribution of FTE (full time equivalent) experience in 5 year bins of COMP full members (a) and CMPs (b) as of Dec. 31, 2019, and again break the distributions down in terms of gender. The same data is tabulated in table 4.2.

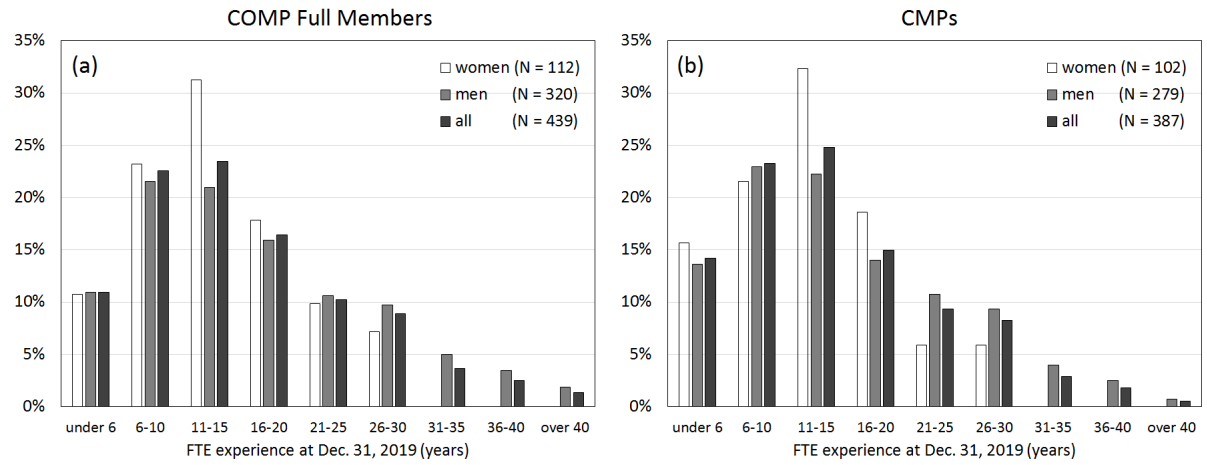

Figure 4.2 Distributions of FTE experience of COMP full members (a) and CMPs (b) as of Dec. 31, 2019.

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

COMP Full Members

	under 6	6-10	11-15	16-20	21-25	26-30	31-35	36-40	over 40	N	mean
female	10.7%	23.2%	31.3%	17.9%	9.8%	7.1%	0.0%	0.0%	0.0%	112	13.9
male	10.9%	21.6%	20.9%	15.9%	10.6%	9.7%	5.0%	3.4%	1.9%	320	16.8
all	10.9%	22.6%	23.5%	16.4%	10.3%	8.9%	3.6%	2.5%	1.4%	439	15.9

COMP CMPs

	under 6	6-10	11-15	16-20	21-25	26-30	31-35	36-40	over 40	N	mean
female	15.7%	21.6%	32.4%	18.6%	5.9%	5.9%	0.0%	0.0%	0.0%	102	13.0
male	13.6%	22.9%	22.2%	14.0%	10.8%	9.3%	3.9%	2.5%	0.7%	279	15.5
all	14.2%	23.3%	24.8%	15.0%	9.3%	8.3%	2.8%	1.8%	0.5%	387	14.7

Table 4.2. The tabulated experience distributions of the COMP membership—full members (top) and of certified members (bottom).

4.3 Specialization

Table 4.3 breaks the membership down in terms of identified area of certification. Of the N = 596 respondents who responded as having certification, 4.4% reported being certified in more than one of the four areas of specialization. Additionally, 5.9% reported certification in mammography physics and 2.2% in health physics. These responses were not restricted geographically or by membership type.

Specialty Certification	Percentage (N = 596)
Radiation Oncology Physics	86.1%
Diagnostic Imaging Physics	7.9%
Magnetic Resonance Imaging Physics	4.4%
Nuclear Medicine Physics	4.4%
Mammography Physics	5.9%
Health Physics	2.2%

Table 4.3. This table details the relative portion of each response to the question: What subspecialty are you certified in? 4.4% of respondents reported being certification in more than one subspecialty.

4.4 Workplace Activities

Many COMP members contribute to various activities of the profession (teaching, research, etc.) outside of or beyond paid hours. Future professional surveys may try to quantify this assertion. Details of the fraction of paid time dedicated to specific categories of workplace activities can be difficult to assess. In general, member responses appear to indicate some variation in understanding of what activities are associated with each category. We have added definitions in section 2, but this is retrospective and these definitions were not provided at the time members were asked to complete the survey. Table 4.4 details the responses to the question: "For the 2019 calendar year, please indicate the percentage of time that you engaged in each

of these activities within your workplace." The N = 324 respondents included COMP full members working in Canada. Responses were normalized such that for each member the time totaled 100%. We were not able to identify any meaningful trends in these categories as a function of years of experience.

Activity (N = 324 respondents)	Mean	Median	Std. Dev.
Administration	11.6%	5.0%	18.4%
Clinical Service	56.5%	65.0%	30.1%
Radiation Safety	6.5%	0.0%	14.2%
Research and Development	15.9%	10.0%	17.8%
Teaching	7.4%	5.0%	8.3%
Other	2.1%	0.0%	9.5%

Table 4.4. This table details the relative portion of each response to the question: For the 2019 calendar year, please indicate the percentage of time that you engaged in each of these activities within your workplace.

4.5 Academic Appointment & Teaching

Many medical physicists have academic appointments associated with their positions. In the past, professional surveys have simply asked whether respondents held a faculty position or not. For 2018, this was true for 51.8% of the 426 respondents. This year, we broke that down into more detailed categories of full, adjunct and clinical adjunct faculty members, as well as categories for 'other' or no appointment. The breakdown for 2019 is shown for full COMP members, N = 431) in table 4.5.

Academic Appointment	Percentage (N = 431)
Full Faculty Member	17.9%
Adjunct Faculty Member	25.8%
Clinical Adjunct Faculty Member	6.5%
Other	6.3%
No Appointment	43.6%

Table 4.5. This table details the relative portion of full COMP members with a specific type of academic appointment.

The survey also queried the topics taught among those who took on teaching duties. Among N = 414 respondents over all membership categories, the distribution of teaching topics is listed in table 4.6. Notably, 14.7 % of respondents included teaching in other topics. A wide range of other topics were listed.

Topic	Percentage (N = 414)
Radiation Therapy Physics	65.2%
Radiation Dosimetry	46.1%
Radiation Protection and Safety	29.0%
Medical Imaging Theory	25.8%
CT Physics	20.8%
Diagnostic Imaging Physics	15.9%
Radiation Biophysics/Radiobiology	14.3%
MRI Physics	12.9%
Nuclear Medicine Physics	9.4%
Ultrasound Physics	8.2%
Other Topics	14.7%

Table 4.6 For those members involved in teaching (not restricted to full COMP members) this table summarizes the topics taught.

Additionally, there were 327 respondents who indicated they were involved in teaching residents. Roles in this context varied greatly from directing residency programs to senior resident members mentoring other residents. Roughly 60.6% of the certified medical physicists and 55.1% of the COMP full membership indicated involvement in resident teaching.

4.6 Reimbursed Time

The survey also asked respondents to break down how many hours they were paid to work in a week. In many cases medical physicists may actually dedicate more time to their duties than they are formally reimbursed for, particularly when research, development, teaching, and administrative activities are fully accounted for. But for the purpose of this survey, the goal is to establish the reimbursement timeframe within Canada. The results of the reported data are shown in table 4.7 for full members and CMPs working in Canada.

	N	under 35	36-40	41-50	51+
Full Members	390	13.3%	79.2%	6.2%	1.3%
CMPs	318	11.6%	82.1%	5.0%	1.3%

Table 4.7. For full COMP members and CMPs working in Canada, the distribution of number of hours of paid work are shown. Similar to past surveys the majority of respondents in either category responded with the 36-40 hour option.

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

5. Reimbursement

5.1 Gross Incomes for 2019

Respondents were asked to report their gross annual income. We report the aggregated results here in table 5.1. For each group we report the number of cases (N), the mean and median values, the 20th and 80th percentile values, and the sample's standard deviation. COMP members have also expressed interest in the relationship between FTE years of experience and gross income so as to describe the change in salary with career progression. For reasons of maintaining anonymity, we are not publishing the actual scatter plot, but we have included in this table the results of linear fits to the incomes plotted against FTE years of experience. Groups with less than N = 5 results are not reported. We report on COMP full members as a whole group, those reporting certification excluding those reporting a director position, and medical physics directors. In table 5.1, groups were limited to those members residing in Canada in 2019.

Parameter	full (in Canada)	CMP (excl directors)	directors
N	310	229	35
mean	$ 147,382.70	$ 144,276.37	$ 183,929.13
median	$ 150,000.00	$ 150,000.00	$ 190,000.00
20th percentile	$ 119,238.10	$ 120,000.00	$ 152,000.00
80th percentile	$ 171,600.00	$ 165,000.00	$ 211,339.13
std dev	$ 34,298.41	$ 27,578.62	$ 40,598.95
slope ($ vs FTE yrs)	$ 1,733.91	$ 1,374.75	$ 3,173.84
y-int ($ vs FTE yrs)	$ 119,253.36	$ 124,414.05	$ 114,129.35

Table 5.1. For full COMP members, CMPs and medical physics directors working in Canada, the parameters characterizing the total gross incomes reported for 2019 are shown. The final two parameters characterize a linear fit to a plot of gross income vs FTE experience in years.

Data was also collected for associate members, who overall reported a mean gross income of $94,524.75 (N = 4). Due to the small sample size we have not further characterized the data. Residents and post-docs (N = 5) reported values with a high standard deviation (> $50,000.00), and we are not sure that members could draw any useful value from the characterized parameters. We are not reporting student incomes as they are largely a function of stipend, awards, scholarships, assistanceships and whether or not additional extra-curricular employment was held. We also are not reporting on salaries of retired COMP members.

In table 5.2 the data for CMPs is broken up by reported specialty. Note that this table includes data from members reporting positions as directors. It also includes data from those members who indicated holding the mammography certification. Recalling the N = 26 members reported more than one specialty, the incomes from those individuals were counted fully in each specialty tabulated.

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

Parameter	Radiation Oncology	Diagnostic Imaging	MRI	Nuclear Medicine	Mammo Certification
N	227	19	8	11	12
mean	$ 150,193.00	$ 142,105.26	$ 140,312.50	$ 154,090.91	$ 134,233.33
median	$ 152,000.00	$ 141,000.00	$ 151,000.00	$ 150,000.00	$ 130,500.00
20th percentile	$ 120,000.00	$ 100,000.00	$ 104,400.00	$ 132,000.00	$ 99,200.00
80th percentile	$ 173,789.40	$ 165,000.00	$ 164,000.00	$ 178,000.00	$ 176,400.00
std dev	$ 31,941.93	$ 49,420.97	$ 33,935.80	$ 24,756.63	$ 39,685.57
slope ($ vs FTE yrs)	$ 2,405.28	$ 1,492.88	$ 2,660.52	$ 759.79	$ -1,582.44
y-int ($ vs FTE yrs)	$ 115,860.48	$ 111,776.14	$ 98,076.82	$ 138,756.89	$ 164,563.41

Table 5.2 Gross incomes for 2019 are reported for CMPs, broken down by area of specialization.

Additionally we examined the breakdown of gross income according to the highest reported degree for the full members and CMPs working in Canada. Analysis was restricted to those members reporting a master's degree or doctorate. Results are shown in Table 5.3.

Interestingly, the mean salary for master's degree holders was reported as higher than for the doctorate holders in both groups. Further, the y-intercept for master's degree holders is also higher, when income is plotted against experience. Readers are cautioned against the interpretation that entering the field with a master's degree results in a higher staring salary than a doctoral degree. We note that median FTE experience was 13 years for the master's (both full members and CMPS) and 10 years for the doctoral groups. The 20th percentile of master's degree holders was 7 years for full members and 8 years for CMPs, while it was only 5 years for the doctoral groups. This suggests that the master's degree holders sampled in this survey have accumulated more experience overall. This reflects a pattern inherent in recent hiring practices in Canada. It is more common for newcomers to the field to hold a doctoral degree.

Parameter	Master's Full Members	Master's CMPs	Doctorate Full Members	Doctorate CMPs
N	33	31	133	116
mean	$ 154,565.56	$ 163,585.91	$ 152,648.11	$ 156,371.34
median	$ 156,000.00	$ 162,149.00	$ 150,000.00	$ 150,000.00
20th percentile	$ 109,816.20	$ 113,400.00	$ 120,000.00	$ 124,086.80
80th percentile	$ 184,866.67	$ 207,200.00	$ 173,420.00	$ 174,600.00
std dev	$ 47,296.08	$ 48,086.08	$ 43,037.62	$ 42,114.28
slope ($ vs FTE yrs)	$ -80.85	$ 1,018.84	$ 2,397.03	$ 2,640.76
y-int ($ vs FTE yrs)	$ 152,117.59	$ 144,859.92	$ 122,826.61	$ 125,638.07

Table 5.3 Gross incomes for 2019 are reported for CMPs

5.2 Gross Incomes by Location

Gross incomes were also striated by geographic region. The parameters characterizing each distribution are listed in tables 5.4, for full members within COMP, and table 5.5, restricted to

those reporting certification, excluding directors. Geography was separated by province, USA and those members outside of both Canada and the USA (denoted World).

Full Members

Province	N	mean	median	20th percentile	80th percentile
BC	38	$ 152,267.49	$ 152,500.00	$ 121,344.00	$ 173,719.20
AB	36	$ 150,217.60	$ 147,000.00	$ 126,000.00	$ 161,500.00
SK	9	$ 147,027.78	$ 145,000.00	$ 127,000.00	$ 193,000.00
MB	9	$ 155,388.89	$ 160,000.00	$ 135,000.00	$ 173,500.00
ON	124	$ 159,726.09	$ 160,000.00	$ 140,000.00	$ 182,000.00
QC	60	$ 112,695.80	$ 110,000.00	$ 100,000.00	$ 124,197.60
NL	6	$ 159,937.50	--	--	--
PE	6	$ 146,766.67	--	--	--
NB	12	$ 144,350.88	$ 146,500.00	$ 120,000.00	$ 177,000.00
NS	10	$ 163,267.10	$ 161,052.00	$ 151,200.00	$ 178,000.00
USA	51	$ 208,133.93	$ 192,000.00	$ 156,200.00	$ 254,600.00
World	6	$ 177,833.33	--	--	--

Table 5.4 Parameters characterizing gross incomes for 2019 separated by geographic region, for full members of COMP. Only mean values are reported for groups of N ≤ 6. Values were reported in Canadian dollars (CAD).

CMPs

Province	N	mean	median	20th percentile	80th percentile
BC	31	$ 147,272.41	$ 150,000.00	$ 120,000.00	$ 172,000.00
AB	27	$ 141,734.58	$ 142,944.00	$ 123,792.00	$ 153,004.80
SK	6	$ 142,875.00	--	--	--
MB	6	$ 151,333.33	--	--	--
ON	89	$ 156,873.25	$ 160,000.00	$ 142,000.00	$ 175,000.00
QC	44	$ 110,744.27	$ 110,000.00	$ 100,000.00	$ 120,000.00
NL	5	$ 157,925.00	--	--	--
PE	3	$ 153,033.33	--	--	--
NB	10	$ 148,800.00	$ 146,500.00	$ 120,000.00	$ 179,000.00
NS	8	$ 163,820.88	$ 161,283.50	$ 149,400.00	$ 181,000.00
USA	46	$ 207,976.49	$ 196,000.00	$ 158,800.00	$ 250,800.00
World	4	$ 186,750.00	--	--	--

Table 5.5 Parameters characterizing gross incomes for 2019 separated by geographic region, for CMPs, excluding those listed as directors. Only mean values are reported for groups of N ≤ 6.

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

5.3 Gross Incomes by Gender

This year a more rigorous analysis by gender was conducted. For the gender distribution reported by the COMP membership see section 3.1. We examined more closely the full members of COMP, CMPs (excluding directors) and directors as striated by gender. Results are tabulated in table 5.6 through 5.8 for each group, respectively. For each group we analyzed the distributions using a two-tailed t-test. Results are indicated at the bottom of each. A resulting probability value of 0.05 or less is considered statistically significant.

Full Members

Parameter	Female	Male
N	82	221
Mean	$ 144,318.86	$ 148,979.60
Median	$ 152,500.00	$ 150,000.00
20th percentile	$ 110,000.00	$ 120,000.00
80th percentile	$ 169,670.00	$ 174,000.00
P (T ≤ t) two tail		0.30

Table 5.6 Gross income parameters of COMP Full Members by sex.

CMPs (excluding Directors)

Parameter	Female	Male
N	66	157
Mean	$ 143,633.58	$ 145,206.83
Median	$ 152,000.00	$ 147,000.00
20th percentile	$ 117,000.00	$ 120,000.00
80th percentile	$ 164,200.00	$ 165,000.00
P (T ≤ t) two tail		0.69

Table 5.7 Gross income parameters of Certified Medical Physicists by sex.

Directors

Parameter	Female	Male
N	6	29
Mean	$ 191,833.33	$ 182,293.78
Median	$ 193,000.00	$ 190,000.00
P (T ≤ t) two tail		0.39

Table 5.8 Gross income parameters of Medical Physics Directors by sex. 20th and 80th percentiles are not reported in this table due to the smaller numbers.

The results in tables 5.6 through 5.8 did not identify any statistically significant difference in these groups when separated by gender and therefore the survey did not provide strong enough evidence to reject the null hypothesis that gross income distributions between genders in these groups are similar.

COMP Canadian Organization of Medical Physicists OCPM Organisation canadienne des physiciens médicaux

5.4 Consulting

Overall, 72 of N = 573 respondents (12.6%) indicated they had performed consulting work in 2019. Of those, 59 (10.3%) resided in Canada. Note that of those who indicated performing consulting work, 15 (12 in Canada) reported specifically zero income from the services. This could be the result of not wishing to disclose actual values or providing services on a volunteer basis. Not counting those reporting zero income from consulting services, the distributions of this income are characterized in table 5.9.

Consulting Income

Parameter	Canada Income	Rate ($/hr)	All Income	Rate ($/hr)
N	47	45	57	55
Mean	$ 21,020.30	$ 166.64	$ 23,007.96	$ 169.63
Median	$ 10,000.00	$ 193.00	$ 15,000.00	$ 200.00
20th percentile	$ 2,000.00	$ 121.00	$ 2,000.00	$ 120.00
80th percentile	$ 37,000.00	$ 200.00	$ 40,000.00	$ 217.00

Table 5.9 Reported incomes from consulting and hourly rates.

5.5 Salary Expectations

Of the full members of COMP (N = 457), 54.9% reported that they expected their income increasing in the next year, 40.5% predicted it would remain the same and 4.6% anticipated a decrease. Responses were similarly distributed across the entire membership. It should be re-iterated that the majority of respondents answered prior to the major changes to healthcare operations in response to the COVID-19 pandemic that began in Canada roughly in mid-March of 2020. For those anticipating an increase, the reasons are broken down as shown in table 5.10.

Reason	Percent of optimistic full members
Cost of living increase	52.0%
Movement on salary scale with experience	49.8%
Performance-based increase	16.0%
Change of employer	10.2%
Milestone-based increase	5.5%

Table 5.10 Reasons for anticipating a salary increase in the coming year.

5.6 Professional Allowance and Benefits

Professional allowances are reported in table 5.11 for both full members of COMP and CMPs (including directors), both working in Canada. Among full members working in the USA, the mean professional allowance (N = 43) was $3746.65 (CAD). It is noted that not all members or CMPs receive professional allowances and the system defaulted to zero for those who did not report and for those who specifically reported zero. The results here are limited to those reporting professional allowances greater than zero and therefore may be higher than the true national average. A breakdown of the items members reporting a professional allowance are permitted to spend that professional allowance on is given in table 5.12 (for all reporting members N = 325).

Parameter	full members	CMPs (incl directors)
N	209	174
mean	$ 2,968.18	$ 3,012.07
median	$ 3,000.00	$ 3,500.00
20th percentile	$ 1,200.00	$ 1,200.00
80th percentile	$ 3,500.00	$ 3,500.00

Table 5.11 The reported professional allowance distribution parameters for full COMP members, and CMPs (including directors) working in Canada.

Reason	Percent of N = 325 full members
Books	68.5%
Conference travel	83.9%
Memberships	79.7%
Electronic devices	47.9%
Other	13.0%

Table 5.12 Items members are permitted to spend professional allowance on, tor those reporting a professional allowance (all members).

Additionally, the membership was asked about the benefits received. In table 5.13, we summarize these for members working in Canada, both those holding full membership and CMPs, inclusive of directors.

Benefit	Full Members	CMPs
N	342	283
Medical coverage	95.0%	78.5%
Dental coverage	87.7%	73.1%
Term life insurance	69.3%	57.6%
Disability insurance	80.4%	65.8%
Retirement pension plan (excl CPP or QPP)	90.6%	75.4%
Sabbatical leave	27.2%	22.2%
Tuition (self)	7.0%	4.7%
Tuition (dependents)	5.8%	2.6%
Parking	7.3%	5.8%

Table 5.13 Further benefits of employment for both full COMP members and CMPs working in Canada.

Finally, the survey also asked respondents to report on allotted vacation time, excluding statutory holidays. A summary of the responses is given in table 5.14. Also includes are linear

regression fits to plots of slope as a function years of FTE experience as an indicator of how vacation time generally changes with experience in the profession.

Parameter	Full Members	CMPs
N	421	355
mean	23.50	23.45
median	22.00	22.00
20th percentile	20.00	20.00
80th percentile	28.00	27.80
std dev	5.76	5.62
slope ($ vs FTE yrs)	0.25	0.27
y-int ($ vs FTE yrs)	19.66	19.39

Table 5.14 Reported vacation time in FTE days for full COMP members and CMPs working in Canada.

6. Medical Physics Workforce

6.1 Retirement Projections

In order to assist with medical physics workforce staffing models, members were also asked when they expected to retire. Over all members the mean expected retirement age was 63.5 years with a median at 65 years. The 20th percentile anticipated retirement at 60, while the 80th percentile was 65. Table 6.1 summarizes the responses for full COMP members and CMPs working in Canada.

Retirement Year	Full Members	CMPs
N	219	176
2025 or before	24.7%	20.5%
2026 – 2030	14.2%	15.3%
2031 – 2035	14.6%	14.2%
2036 – 2040	21.5%	24.4%
2041 – 2045	15.5%	15.9%
2046 – 2050	5.5%	5.7%
2051 – 2055	2.7%	2.8%
2056 and over	1.4%	1.1%

Table 6.1 Anticipated year of retirement for both full COMP members and CMPs working in Canada.

6.2 Volunteer Roster

Out of N = 669 members who responded to questions about volunteering service for COMP, 35.6% indicated they are interested, 49.3% were not interested at the current time, and 15.1% were already volunteering in some capacity. Also, 48.7% of the membership (N = 336) indicated interest in reviewing abstracts for the COMP Annual Scientific Meeting, while 47.9% of the

membership (N = 330) indicated an interest in reviewing articles for the Journal of Applied Clinical Medical Physics.

Also 68.3% of members (N = 446) indicated an interest in connecting (e.g. through email) with other COMP members who have similar interests.

Preferred volunteer activity type	All Members
N	669
Professional Affairs	16.9%
Communications	8.1%
Science	26.3%
Education	26.2%
Collaboration with others on topics such as imaging	17.8%
Collaboration with others on topics such as QA and radiation safety advisory	24.1%
COMP awards and nominations	9.9%
Other	2.8%

Table 6.2 The preferred activities of those willing to volunteer for COMP.

6.3 Important Job Features and Challenges

This year in the survey we also asked respondents to answer two questions:

a) What features of your job are important to you? They may or may not be part of your clinical role.
b) What features of your job are the most challenging for you?

The responses were tallied in a word cloud generator (wordart.com/create) and the top 16 words generated a word cloud. This are displayed for question (a) N = 372, and for question (b) N = 281, in figure 6.1. Responses were tallied for all respondents. Overlap between the two questions appears to be considerable.

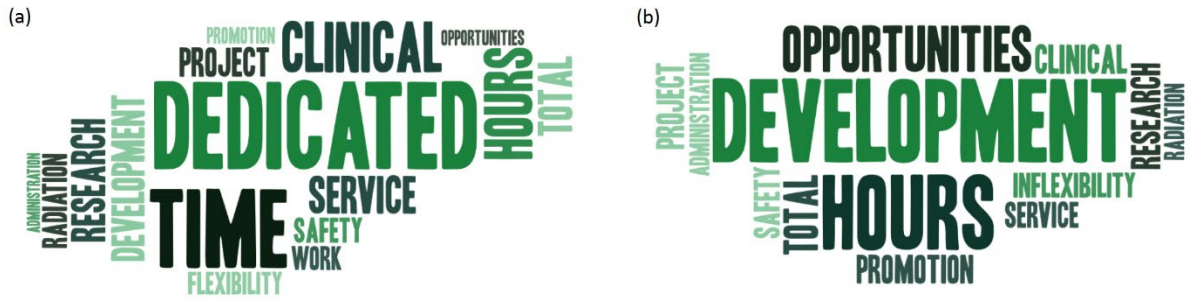

Figure 6.1. Word clouds were generated in response to questions to identify both important features of the membership's jobs (a) as well as the challenges (b). Note in (a) "dedicated" and "time" occurred together (i.e. "dedicated time") suggesting that dedicated time for things like project development were frequently cited as an aspect of the job medical physicists identified as important.

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7. Interaction with Other Organizations

7.1 CCPM Membership

The CCPM membership numbers are given as per tables 7.1- membership up to 2019, and 7.2 – new members up to 2019.

Year	Diagnostic Radiological Physics	Radiation Oncology Physics	Magnetic Resonance Imaging	Nuclear Medicine Physics	Mammography Physics
2013	20	314	9	14	12
2018	28	419	10	17	22
2019	29	434	10	17	37

Table 7.1 Membership numbers with the CCPM in 2019.

Year	Diagnostic Radiological Physics	Radiation Oncology Physics	Magnetic Resonance Imaging	Nuclear Medicine Physics	Mammography
2013	0	17	1	0	0
2018	1	19	0	1	2
2019	0	20	0	0	0

Table 7.2 New members accepted within the CCPM in 2019.

7.2 Membership With Other Organizations

COMP members have memberships with other organizations as well. Approximately 81.8% of the COMP membership responding to this question (N = 530) are also AAPM members. Table 7.3 identifies other organizations members listed memberships with. This list is not exhaustive. Many members lists memberships with provincial medical physics associations.

Other Organization	Percent of COMP Membership
N	530
AAPM (American Association of Physicists in Medicine)	81.8%
CAP (Canadian Association of Physicists)	7.8%
ISMRM (International Society of Magnetic Resonance in Medicine)	8.1%
ASTRO (American Society for Radiation Oncology)	6.7%
ESTRO (European Society for Radiation Oncology)	6.4%
CRPA (Canadian Radiation Protection Association)	1.9%
ABS (American Brachytherapy Society)	1.9%

Table 7.3 Membership with a selected number of other organization.

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8. Acknowledgements

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