MEDICAL PHYSICS AND DIVERSITY: OPPORTUNITIES AND STRATEGIES

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TAKING STOCK OF THE CURRENT LANDSCAPE
WHERE ARE THE OPPORTUNITIES?
WHAT ARE POTENTIAL STRATEGIES?
Assessment of the Current US Radiation Oncology Workforce: Methodology and Global Results of the American Society for Radiation Oncology 2012 (International journal of radiation oncology, biology, and physics) 6795 of a potential 35,2014 respondents including radiation oncologists, residents, medical dosimetrists, radiation therapists, medical physicists, nurse practitioners, nurses, physician assistants, and practice managers/administrators responded. 75% of radiation oncologists, residents, physicists who responded were male; 2/3 in other segments, female.

Diversity Based on Race, Ethnicity, and Sex, of the US Radiation Oncology Physician Workforce (International journal of radiation oncology, biology, and physics) Publicly available data sources were used e.g. AAMC and US census registries. Women (33.33%) and URM (6.9%) are underrepresented as residents. Women (23.8%) and URM (8.1%) are underrepresented as faculty and practicing physicians, 25.5% and 7.2% respectively. No trend towards diversification in 8 years.


ARE WE RECRUITING AS MANY ETHNIC MINORITIES AS WE CAN RECRUIT?

Source: APS.org, Accessed July 2016

PHYSICS IS BELOW ALL BIOLOGICAL SCIENCES WITH REGARD TO URM REPRESENTATION

ARE WE RECRUITING AS MANY WOMEN AS WE CAN RECRUIT?

WHERE ARE THE OPPORTUNITIES?

PHYSICS MAJORS ARE ATTRACTION TO OTHER SECTORS BESIDES HEALTHCARE
PROPORTIONALLY MORE PHYSICS MAJORS WITH DISABILITIES ARE GETTING PHYSICS PHD DEGREES

Source: IOP.org, Accessed July 2016, Institute of Physics, UK

PROPORTIONALLY MORE BLACK PHYSICS MAJORS ARE GETTING EITHER PHYSICS MASTERS OR PHD DEGREES

Source: IOP.org, Accessed July 2016, Institute of Physics, UK

Figure 2.4c
Destinations of female respondents with MPhys/MSci degrees one year after graduation (n=213)

Master's 55.9%
PhD 44.1%
Employed 46.7%
Teacher Training 4.4%
Unemployed 2.8%
Other 2.8%

Significant proportions of men and women are completing masters and doctoral degrees. However, more women than men are choosing Masters degrees rather than PhD's.

Source: IOP.org, Accessed July 2016, Institute of Physics, UK

Figure 2.4d
Destinations of male respondents with MPhys/MSci degrees one year after graduation (n=432)

Master's 54.4%
PhD 45.6%
Employed 44.3%
Teacher Training 3.8%
Unemployed 3.2%
Other 3.2%

When considering the proportions of respondents studying for a PhD, 44.6% of women and 48.1% of men with MPhys/MSci degrees chose this option compared to only 10.9% of women and 12.5% of men with BSc degrees. This indicates that the MPhys/MSci is being maintained as the primary route into PhD study.

Females with BSc degrees were the most likely of the four groups to go on to teacher-training courses, with 9.3% of respondents choosing this route compared to 4.4% of men with BSc degrees, 1.4% of women with MPhys/MSci degrees and 1.9% of men with MPhys/MSci degrees.
WHAT ARE POTENTIAL STRATEGIES?

• LEADERSHIP THAT FOCUSES ON THE IMPORTANCE OF INCLUSION AND DIVERSITY
  • Clear articulation of the importance of diversity in the vision and mission statements of the organization
  • Alignment of inclusion/diversity goals with the central vision/mission of the organization
  • Dedicated members/staff organized to facilitate the achievement of these goals and charged with the responsibility of holding the leadership accountable for these goals
  • Policies related to harassment/bullying

WHAT ARE POTENTIAL STRATEGIES?

• REMAINING INCLUSIVE IN AAPM’S DEVELOPMENT OF ANNUAL MEETINGS AND CULTURE
  • Attention to the demographic balance of speakers
  • Travel scholarships for promising new additions to the Society
  • Develop supportive mentoring program
  • Outreach with local undergraduate institutions during conferences
  • Development of the programming of annual meetings and culture
WHAT ARE POTENTIAL STRATEGIES?

- Active recruitment to the field at all levels of education/training. Consider the following:
  - "In 2003, 25.6% of employers offering MP positions in the AAPM bluebook required a candidate to hold a PhD. By 2009 that percentage increased to 32.2% of employers."*

- Active recruitment of candidates from other fields. Consider the following:
  - "Almost half (47%) had a previous career and 9% obtained their highest degree in a country other than the U.S. This cohort was the least likely of all professional cohorts to have an academic concentration in medical physics at the master's degree level (28%) and was more likely than other cohorts to have learned about the profession during doctoral studies (17%), fellowships (10%), or other employment (18%)."* (*Workforce study of Medical Physicists in the U.S. AAPM, 2009-10)

Early Exposure to Radiation Oncology Encourages Students to Seek Advanced Degrees and Introduces Students to the Field

- Summer Undergraduate Program for Educating Radiation Scientists
  - SUPERS@PENN is a ten week summer research program hosted by the Department of Radiation Oncology at the Perelman School of Medicine. The program has been funded by the NCI since 2010, with additional support by the School of Medicine since 2015.
  - The core aspects of the program are an individualized curriculum, hypothesis-driven laboratory research, and pairing students with faculty mentors.

Data from Dr. Steve Tuttle at the University of Pennsylvania
“Diversity is a reality, inclusion is a choice…”
Stephen Frost
The Inclusion Imperative, 2014

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