



Women in Medical Physics and Biomedical Engineering: past, present and future

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Abstract

Women in Medical Physics and Biomedical Engineering (WiMPBME) is a Task Group established in 2014 under the International Union of Physical and Engineering Scientists in Medicine (IUPESM). The group's main role is to identify, develop, implement, and coordinate various tasks and projects related to women's needs and roles in medical physics and biomedical engineering around the world.

The current paper summarizes the past, present and future goals and activities undertaken or planned by the Task group in order to motivate, nurture and support women in medical physics and biomedical engineering throughout their professional careers. In addition, the article includes the historical pathway followed by various women's groups and subcommittees from 2004 up to the present day and depicts future aims to further these professions in a gender-balanced manner.

Keywords Women in STEM · Gender equity · Leadership · Work · Women organizations

1 Introduction

Medical physics and biomedical engineering are multidisciplinary fields that are both built around a core of fundamental sciences. As part of STEM fields, medical physics and biomedical engineering have encountered over the years similar gender imbalance as the other, more traditional sciences. In any research field or activity, the gender balance was shown to be a critical factor in sustaining a healthy working environment and an optimal platform for the professional

development of both genders. As a result, several working groups, committees, and even organizations have been founded over the last few decades to stimulate and continuously support women in their STEM professions.

To give women working in medical physics and biomedical engineering an official platform and voice, the Women in Medical Physics and Biomedical Engineering (WiMPBME) Task Group was established in 2014 under the International Union of Physical and Engineering Scientists in Medicine (IUPESM). The main goals of WiMPBME include the

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development, implementation and coordination of tasks and projects related to the needs and roles of women in medical physics and biomedical engineering around the world [1]. Whether educational, research-related or targeting continuous professional development, all these activities within the abovementioned fields are encouraged and supported by the WiMPBME Task Group and promoted through various routes, from a dedicated website to international conferences.

Our Task Group also aims to provide mentorship and leadership support to female scientists for their career advancement and to engage female professionals as speakers, track chairs and session chairs at key conferences and workshops. Not ultimately, the Group's goal is to develop a database comprising of past and current female professionals in biomedical physics and engineering fields in order to document their accomplishments and to continue pursuing their aspirations.

This article is a collection of past, present and future activities related to our Task Group that aims to illustrate the standing of WiMPBME within the larger organizations that support the interests of medical physicists and biomedical engineers alike.

2 The past: a brief history of WiMBES (2004–2015)

After initial deliberations that started at the World Congress in Medical Physics and Biomedical Engineering (WC) 2003 in Sydney, the working group (WG) “Women in Medical and Biological Engineering and Sciences” (WiMBES) was established at the Administrative Council (AC) meeting in Naples and a Charter was submitted to AC with the following composition: Chair - Dr. Maria Siebes, The Netherlands; Vice-Chair - Dr. Lauren Poole-Warren, Australia; Member - Dr. Alicia El Haj, UK. The WiMBES WG was established to be responsible for investigating and making recommendations to the administrative council regarding the issues and steps to (1) increase the visibility and participation of women within the International Federation for Medical and Biological Engineering (IFMBE), (2) address ways to improve the climate for women in biomedical engineering and the workplace, (3) gather and disseminate information on the status of women in biomedical engineering. The activities implemented by this WG to increase the visibility of women are along the same line with the activities of the current WiMPBME: recognition (award) of biomedical engineering research or innovation conducted by women; invitation for articles in the field with female authors; prize for best paper of a young female researcher in biomedical engineering; collect and disseminate information on the

status of women in biomedical engineering such as surveys, number of female members in member societies, professional background; collect and disseminate information on contributions by women to the WC; organize sessions/workshops for women researchers (stand-alone or as part of the WC); prize for a female graduate student (best paper) and travel grants (\$500) for 3 female students to attend the WC.

In 2005 the status of WiMBE as a WG was changed to a Committee to underline its more permanent character, which led to the creation of a link on the IFMBE website, involvement in the Publication & Publicity Committee and the International Academy of Medical and Biological Engineering (IAMBE) Fellows Nominating Committee. It is noted that in 2006, the IFMBE had no female officers, AC members, IFMBE presidents, or merit awards. Only 1/40 (2.1%) of women were honorary life members and 3/74 (3.9%) were IAMBE fellows. Therefore, WiMBE encouraged all officers, IAMBE fellows, and members of the AC to promote access and actively seek women for governing boards, academy membership, and awards within the IFMBE.

For a better overview on the status of women in member societies, in 2006, a questionnaire was sent to all societies related to biomedical engineering. Results showed that about 20% of national society members were female, but 35% of all student awards were won by women. However, less than 10% of senior members were women and less than 5% were fellows. The societies' governing boards counted about 15% women, which was better than the situation within the IFMBE itself.

The proportion of women at the WC2006 in Seoul was dismal: there were 17% female conference registrants, but none of the 10 plenary speakers was female; only 5% of the 251 invited speakers, 2% of the 57 track chairs, and 3% of the 58 members of the International Program Committee were women. At this world congress, an inaugural symposium “Women in biomedical engineering: worldwide perspectives” was organized. The inaugural WiMBE symposium was held to highlight the growing role of women in this field. The symposium was chaired by Maria Siebes and Yoonshin Lee of Seoul National University. Other speakers were H. Voigt (USA), L. Holley (Australia), and L. Powers (USA). Regrettably, the titles of the presentations and the speakers of this symposium were not listed in the program and it was scheduled by the conference organizers at 8:00 am in a rather remote and difficult to find location. Despite the early hour and the lack of hot coffee, the session was well received and concluded with a panel discussion. Thanks to the initiative of Herb Voigt, a contribution of \$500 could be presented on behalf of the IFMBE to the Woodward School

for Girls in Quincy, Massachusetts, in support of new laboratory facilities.

Further activities were organized in the forthcoming years to promote women scientists in the field of biomedical engineering. In April/May 2008, in Amsterdam, Maria Siebes participated in the “Tube Your Future” project organized by the NEMO Science Center in Amsterdam. This EU funded project was developed within the framework of the EU Gender Awareness Participation Process (GAPP) with the aim to overcome gender differences by interesting more students, especially girls, for a career in science and technology. The Tube Your Future activity was a video contest that challenged high school pupils to interview and film professionals in the field of science and technology. The movie, with a maximum of 4 min, could be uploaded on a special NEMO channel on YouTube. The three best movies were honored with an award handed out on a glamorous award gala in Science Center NEMO. Maria was interviewed by 4 high school girls (age 16) about “Biomedical Engineering” and their movie was one of three winners in the national competition. In November 2008, in Brussels, the contribution to the Dutch “Tube Your Future” project was featured at the final GAPP conference held at the European Parliament: MIND THE GAPP: Working with young people to improve gender equity and participation in science and technology. This meeting was attended by members of the EU Parliament (Committees on Industry, Research and Energy and Women’s Rights and Gender Equality), national organizations from the participating countries, senior industry officials, and representatives of the Belgian Network for Women in Science (BeWISE) and the European Platform of Women Scientists (EPWS).

In December 2008 at Chicago, Maria Siebes represented the IFMBE WiMBE at the first Women’s Leadership Symposium organized by the American Institute for Medical and Biological Engineering (AIMBE): It’s Your Responsibility – How to Lead, Impact Policy and Change the Role of Women in Medical and Biological Engineering. The primary objective of this meeting was to learn about challenges women face as they advance their careers and to share strategies for improving processes that may adversely impact the advancement of women. The meeting attracted about 60 attendees, including AIMBE Fellows, university researchers, industry leaders, and policymakers. Maria’s presentation was “Fixing the leaky pipeline - EU perspectives on improving retention of women engineers and scientists”.

At the next WC2009 (Munich), a session “Women in MBE and Physics” was organized as a series of presentations followed by a panel discussion. Invited speakers were Susanne Ihlen, Gender Studies in Engineering Sciences, Technical University Munich, Germany; Emmanuelle Causse, Manager Research Policy and Partnerships, European Platform

of Women Scientists, Brussels, Belgium; Jennifer Ayers, Executive Director, American Institute for Medical and Biological Engineering, Washington DC, USA.

In 2009, after 2 terms, Maria stepped down and Monique Frize was the new WiMBE chair, assisted by the vice-chair, Laura Poole-Warren from Australia. Other members were Alicia El-Haj (UK), Herbert Voigt (USA and President IFMBE), Maria Siebes (Netherlands), Eleni Kaldoudi (Greece), Susana LLanusa (Cuba) and Jennifer Ayers (USA). The proposed plan was to increase the visibility of women within and outside of IFMBE. The plan included: the development of a web page for the committee activities and information; issuing a newsletter once per year with news from WiMBE and from the member organizations; the organization of a workshop at each regional conference and at the WC2012; and nomination of qualified women for the Academy, Fellowships, awards, and positions in committees and the Administrative Council.

The series of events continued with a workshop on women in BME held at MEDICON in Greece (2010), where around 50 people attended the workshop, followed by many questions and comments during a networking lunch. Several persons showed much interest in joining the WiMBE’s efforts after this event. At EMBEC in Budapest, a panel meeting took place, with four persons being invited to the Committee meeting: Kathleen Geraedts (Belgium), Marta Zequera (Colombia), Svenja Knappe and Shankar Krishnan (USA). Kathleen, Herb, Maria and Monique were the speakers at the panel. The talks included recent statistics about women’s participation in BME.

In 2011, the Laura Bassi Award was created, and nominations were sought for a first award being given at WC2015 in Toronto. A major discussion was about the visible participation of women at IFMBE conferences. To date, there had been no women or very few invited as plenary speakers and none that we could recall as keynote speakers; only a few were invited to chair sessions. The 2012 World Congress had only men as plenary and keynote speakers on the website at the time of the meeting in Budapest. The committee thought it was urgent to develop a database of names of women and topics to share with the organizers of the next conferences. There was also a need to participate in scientific program committees in order to suggest women for various roles. For the WC2012, a workshop was held with people in groups on questions and solutions and the results were shared with all participants. To add some gender balance, Monique invited several women to be Track Chairs for Theme 17 for which she was one of three co-chairs. WC2012 agreed and added a few women keynote speakers as well as 40% chairs for Theme 17. A networking lunch followed the workshop. It was noted that it was most important for women to be on the program committee for WC2015 in Toronto.

Between 2012 and 2015 Monique Frize (Canada) continued as Chair, with Laura Poole-Warren (Australia) as vice-chair and the following members: Consula Varela Corona (Cuba), Alicia El-Haj (UK), Birgit Glasmacher (Germany), Tan Peck Ha (Singapore), Eleni Kaldoudi (Greece), Andre Linnenbank (Netherlands), Susana Llanusa (Cuba), Ratko Magjarevic (Croatia), Penny Martens (Australia), Shauna Mullally (Canada), Lena-Kajsa Siden (Sweden), Maria Siebes (Netherlands), Herbert Voigt (USA), May D. Wang (USA). In addition, a sub-committee was set up in 2012 to develop a proposal for a new award. Alicia El-Haj chaired this group and worked with Laura Poole-Warren, Penny Martens, and Monique Frize to determine criteria and propose an amount to award. The winner was scheduled to speak about her work during the Networking Lunch on June 8, 2015. This project responded to the plan to enhance the visibility of women at WC2015. Another achievement was the inclusion of gender in the H2020 program (article 15), which was initiated and announced by Eleni Kaldoudi in the Committee meeting in November 2013.

In 2013, WiMBE suggested developing a Track for the WC2015 on Women in Biomedical Engineering and Medical Physics. Herbert Voigt recommended making this a Theme. Monique Frize was asked to develop the Theme and Track 18 with two co-chairs: Patricia Trbovitch, a biomedical engineer from Canada and Kristy Brock – a medical physicist from the USA. This led to very successful sessions. Eva Bezak and Loredana Marcu were also heavily involved in preparation of these sessions. Monique Frize was appointed Co-Chair of the International Advisory Committee for WC2015 and managed to suggest women's names, with the final list having just under 30% names of women. She was also a Co-Chair of the Scientific Committee and made many suggestions of women to reach at least 30% of women as Co-Chairs of Tracks. For plenary keynotes, there were four women and three men, a situation that was unique to WC2015. The collaboration of colleagues on the organizing committee, especially Herb Voigt, to support the participation of women at all levels was amazing. WiMBE hoped this would set a model for future World Congresses. Monique was elected to the Council of the IUPESM and asked to chair the new Task Group on Women in Medical Physics and Biomedical Engineering with Eva Bezak as the MP co-chair. The terms of reference and the workplan were developed shortly after.

2.1 2015 – present

Although there was enormous literature available regarding the representation of women in general, the gender composition of medical physicists worldwide was basically unknown. IOMP thus decided to perform the first

international study on the number and percentage of women medical physicists at a global level performed in 2013 and published finally in 2015 [2]. Sixty-six countries responded to the survey. The total number of MPs was 17,024, of which 28% were female (4807), with median values of percentages of females being 21% in the USA, 47% in Europe, 35% in Asia, 33% in Africa and 24% in Latin America. There were a number of European countries that were far from the target set by the European Commission (40%). In contrast, countries in the Middle East and Asia have a so-called tradition of biases against women entrenched in their history and culture where female MPs outnumbered men. The USA, which may be expected to have a higher percentage of women, has actually lower, even though they have almost 3 times the number of MPs than other parts of the world.

The survey resulted in forming a women IOMP Subcommittee (IOMP-W) [3]. The main objectives of the IOMP-W group were to (1) develop, implement and coordinate tasks and projects related to the role of females in medical physics scientific, educational and practical aspects, (2) to disseminate the experiences, good practice and learning within IOMP NMOs and other relevant, accessible areas/ across the globe, (3) popularize the role of the women in medical physics and encourage female medical physicist to advance in the profession, (4) organize international cooperation in medical physics and related specialties and (5) provide regular status/progress updates to the IOMP on all tasks and projects related to the IOMP Women Group. The IOMP-Women Subcommittee organized 2 women symposiums during the International Conference of Medical Physics held in Bangkok 9–12 December 2016: (a) Women in medical physics: education and profession and (b) Participation of women in medical physics scientific events that were well-attended. Apart from many women, there were men in the audience who had interesting suggestions and even showed interest in joining us to promote the IOMP-W goals. The group designed a limited number of t-shirts with a logo: “Women can do anything, but women and medical physicists are a perfect match” that many women wore during these sessions. These shirts were also distributed during the conference. Magdalena Stoeva, the editor of IOMP electronic Newsletter (eMPW), kindly suggested a special issue on Women Medical Physicists that inspire all women around the world, which was released on the 8th of March 2017, marking the International Women's Day and was distributed at various international conferences during 2017 [4]. All women in this issue were in leadership positions in WHO, IAEA, ICTP, AAPM and other organizations that would act as an inspiration for young professionals in the field of science. Also in 2017, the International Day of Medical Physics was devoted to women. The year marked the 150th birthday of Marie Skłodowska-Curie and the theme

was “Medical Physics: Providing a Holistic Approach to Women Patients and Women Staff Safety in Radiation Medicine”. IOMP celebrated IDMP 2017 with a number of activities, including a whole day session that was broadcasted across the world during the 17th Asia-Oceania Congress of Medical Physics (AOCMP) and the 38th Annual National Conference of Association of Medical Physicists of India (AMPICON) along with broadcasts of IAEA and WHO. As part of the celebration, a public awareness rally was organized by female students, which was flagged off by IOMP President Prof Tabakov followed by a balloon rising from the conference president Prof Chougule. Four hundred delegates participated in the rally with posters, banners and placards. Following the IOMP-W Subcommittee proposal, IOMP performed a more detailed survey that focused on updating data on the global medical physicists (MPs) workforce and investigating whether there is a gender dimension in higher hierarchy positions [5]. Regarding women’s representation, the study concluded that after 3 years from a previous study, women’s representation is still away from the United Nations and European Commission’s goals. More importantly, representation in higher hierarchy positions is low. As far as synthesis of the executive boards of medical physics societies is concerned, the proportion of women was between 21 and 40% and from the 65 presidents reported to date, only 19 were women (29%). More than half of societies (52%) did not have a woman president in the last 10 years and 33% had only once. As far as IOMP was concerned, results showed that from 1963 (the year of IOMP formation) until 1994 (32 years after), there was no woman MP in the IOMP Executive Committee. From 1994 to 2018, women representation ranged from 20 to 40%. Furthermore, from 1963 until today, there was only one woman IOMP President. As a result of this survey, the IOMP Executive Committee decided in 2018 to encourage a 30% women representation in all its committees.

3 The present

At the IUPESM World Congress 2015 in Toronto, a business meeting with the round table was organized jointly by WiMBE (IFMBE) and WiMPBME (IUPESM). It brought very lively discussions on the biomedical engineering and medical physics professions and the position of women in these professions in various countries. During the WiMPBME meeting, an initial discussion on a strategic plan for 2015–2018 was held. The main objectives were to support networking between the WiMBE committee in IFMBE and WiMP in IOMP, increase the visibility and participation of women within IFMBE and IOMP, and gather and disseminate information regarding the status of women

in IFMBE and IOMP. Additional objectives were defined in research, education, mentoring, networking, work in committees and preparation of future conferences.

In 2016, members of the WiMPBME and WiMBE met during the IFMBE MEDICON 2016 conference in Paphos, Cyprus. They jointly organized a special session for Women in Biological Engineering and Science. At the EMBEC and NBC 2017 conference in Tampere, Finland, almost all WiMBE members were members of the conference scientific committee. 2 out of 9 keynote speakers were women: E. M. J. (Sabeth) Verpoorte from the University of Groningen, The Netherlands, and Molly M. Stevens from Imperial College London, United Kingdom. In addition, Eleni Kaldoudi and Birgit Glasmacher organized a special session for Women in Biomedical Engineering in Europe.

The IUPESM World Congress 2018 was organized in Prague, Czech Republic. In the congress coordinating committee, there were 8 members that included 2 women: Monique Frize, IFMBE, Canada and Virginia Tsapaki, IOMP, Greece. The congress organizing committee was composed of 7 men and 4 women. The scientific committee had 4 co-chairs – two women and two men. Three keynote speakers were women. Many scientific sessions were chaired and co-chaired by women. The special session on Women in Medical Physics and Biomedical Engineering was proposed by WiMPBME and coordinated by Eva Bezak. It was very well populated and finally had to be divided into three separate parts, chaired by Lenka Lhotska and Loredana Marcu, Eva Bezak and Rossana Castaldo, Virginia Tsapaki and Monique Frize. It brought many interesting topics and lively discussions to all contributions. During the WiMPBME meeting, the previous period’s strategic plan was discussed and decided to continue in the same line.

The last two years, 2020 and 2021, were influenced by the Covid-19 pandemic. There were no face-to-face meeting of the WiMPBME and WiMBE. All activities took place in the virtual space – teleconferences and e-mails. Members of WiMPBME decided to design a survey mapping the impact of Covid-19 on gender-related work from home in STEM professions with a special focus on medical physics and biomedical engineering. The findings and analysis were recently published [6]. For the next IUPESM World Congress (postponed from 2021 to 2022), several special sessions were proposed by the WiMPBME members, one of them focusing on the role of women within the profession: Leadership and collaboration in medical physics and biomedical engineering - women leaders.

3.1 IOMP perspective

Medical Physics is considered the most gender-diverse field of Physics. However, it is far from representative of the

global population since only 29.8% of medical physicists worldwide are women [5]. Studies and professional surveys show the gender inequality in medical physics, including gender distribution [5], publications [7], research funding [8], and salary [9].

In medical physics publications, only ~22.5% of authors were women. However, given that the proportion of female authors increases by 1% each year, Holman et al. [7] estimated that the field of medical physics might achieve gender parity in authorship in 25 years.

In 2018, the American Association of Physicists in Medicine (AAPM) approved a strategic goal to “champion equity, diversity, and inclusion” [10, 11]. They implemented policies and initiatives to accelerate progress toward overcoming the barriers to equity, allocating resources for that purpose as needed and available. The Women’s Professional Subcommittee (WPSC) and the Diversity and Inclusion Subcommittee (WMRSC) were identified as the initial pillars to build upon the AAPM strategic goal. These committees coordinated efforts to evaluate AAPM infrastructure and resources to achieve the goal’s objectives.

In December 2019, a standing committee for Equity, Diversity, and Inclusion (EDI) Committee was created under the AAPM Professional Council, chaired by Dr. Julianne Pollard-Larkin. The EDI Committee advises the Professional Council and the AAPM Board of Directors on matters relating to equity, diversity, and inclusion in medical physics.

The first action was to evaluate EDI in AAPM organizational structure and activities. A working group created and distributed the first AAPM EDI Climate Survey to assess the equity, diversity, and inclusion climate and analyzed the diversity within the membership, volunteers, and leadership. Nearly 1400 full AAPM members responded to the survey and answered questions about their perceptions of inclusion, bias, and other issues at their private workplace, at the scientific organization. They also encouraged AAPM members to provide demographic information and make recommendations for the protection and anonymity of the data. One of the most recent tasks regarding EDI in AAPM is the work of the Ad Hoc Advisory Committee on Gender-Neutral Language in governance documents (AHGNL). AHGNL’s main objective is to provide edits and recommendations to remove gender-specific pronouns from AAPM’s governance documents to make the documents more inclusive and equitable. So far, AHGNL has completed its suggested list of recommendations, and it is in the hands of AAPM leadership and the Board to decide how to proceed.

A survey showed only 12% (US), 14% (Canada), and 18% (other countries combined) of AAPM female members have clinical leadership roles [5]. Similarly, women occupying board seats, acting as council chairs, graduate or

residency program directors, journal editors, or award winners are lower in proportion than the overall percentage of female AAPM members [9].

Small but essential actions address childcare responsibilities and improve young women’s participation in conferences. For example, in a qualitative study with medical physics residency program directors [12], many participants cited the new childcare offering at the annual AAPM meeting as a positive step in helping more women physicists have the opportunity to attend this meeting.

4 The future

Over the years, all organizations have made substantial positive strides toward achieving gender equity. Nowadays, information about each committee’s gender, race, and culture is publicly available. However, reviewing the AAPM webpage, one notices continuous attention to the gender balance. For example, the 2022 executive committee has only one-fourth of women, less than 25% of the Board of directors, and no women in the presidential chain.

To ensure the efforts to support the growing numbers of women medical physics trainees and make way for other marginalized groups, the AAPM EDI committee has created the following recommendations to advance EDI: to establish a permanent EDI committee in the Professional Council; to create an EDI training strategy to ensure that all members and especially AAPM leaders are culturally-competent and inclusive; to establish routine EDI Climate Surveys and research focused on EDI issues within AAPM; to require that at least one woman or racially-underrepresented person is considered for a leadership position, such as conference speaking engagements, task group positions, and others; to establish funding and award opportunities that support EDI initiatives in AAPM; to create and maintain a mentorship program for underrepresented faculty and trainees in Medical Physics programs to cultivate an inclusive and equitable Medical Physics workforce.

WiMPBME aims to continue current programs and implications in international organizations via conferences, webinars, newsletters, and publications on WiMPBME’s role and achievements. WiMPBME will encourage more organizations internationally to offer women STEM scholarships, women awards recognition in education, entrepreneurship, career medical physics and BME, and gender equality awareness program. In 2021 British council has been the leader by offering the British Council Scholarship for Women in STEM. This new scheme has supported 100 women from countries in the Americas, South Asia and East Asia to obtain their advanced degree from a UK university, permitting them to further develop their careers in science.

Beyond encouraging women to pursue education and careers in STEM, WiMPBME will also engage universities to reconsider offering a more business-centered curriculum embedded in the STEM program for young adults aiming to go the startup and entrepreneurial routes. This curriculum will lead students to the different pathways available to them and allows them to consider leadership roles in STEM that may not have been as apparent previously. It is WiMPBME's objective for future women in STEM not only to work in companies but will be a technopreneur and an entrepreneur of their own start-ups. One of the projects WiMPBME will embark on is to collect the international data on the numbers of women in STEM who have been CEO, entrepreneurs, technopreneurs and highlight this in publication to inspire other women in STEM to follow the footsteps and excel in this career path.

WiMPBME has recently joined the Standing Committee for Gender Equality in Science (SCGES), a new collaboration established in 2021, being represented by the current chair and vice-chair. Among others, the SCGES aims to help partners to promote gender equality within their organizations and to follow the progress of the implementation by partners of the recommendations of the Gender Gap in Science Project.

WiMPBME will continue to raise awareness and educate on issues of gender inequality. It is essential for people of power to lead by example and realize that their behaviors may carry biases unintentionally. Only if we acknowledge our biases can we make progress toward real change. WiMPBME will strive to create awareness about the impact these issues have on women in science and engineering. Education about gender bias, in all areas, needs to begin in the early stages of childhood. It is also essential, especially when it comes to STEM, to normalize men and women with similar interests, careers, and hobbies outside societal norms. Students and young adults commonly feel as if they have to choose careers based on their gender, which should not be the case. Statistical data has shown that fewer women make up the engineering field than men. Representation is vital if we want those numbers to increase. Without female representation, young girls will grow up believing there is not a place for them in STEM. It is crucial for them to feel inspired to work toward their goals in science and engineering careers.

According to the UN Scientific Education and Cultural Organization (UNESCO) data, fewer than 30% of researchers worldwide are women, and only 30% of female students select STEM-related fields in higher education. Globally, female students' enrolment is particularly low in Information and Communications Technology (3%), natural science, mathematics and statistics (5%), and engineering, manufacturing and construction (8%). Thus, one of the projects to

be started in the near future by WiMPBME is targeting gender equity in research, leadership, and academia. Our Task Group is planning to gather information on women scientist participation in research grants, both in terms of grant applications as a Principal Investigator and successful grant awards. We would like to investigate and analyze the male-female ratio of applicants and grant winners, as well as the gendered ratio in leadership positions in both clinical and academic environments within our professions.

Our recommendation to the AC of IUPESM, IFMBE, and IOMP is to create a committee to ensure conference memory. The experiences learned at each event and the names of active participants (women and men) should be passed from one event to the next. This committee would ensure that all relevant materials and debriefing conversations with conference organizers be recorded and passed on to the next leaders. This is particularly important in the case of women's participation as all past congresses, with the exception of WC2015, had a very small number of women invited at visible levels such as plenary and keynote speakers, track chairs, and receiving prizes and awards.

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