Current Status of Medical Physics Recognition in SEAFOMP Countries

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Abstract— **South East Asian Federation of Organizations for Medical Physics (SEAFOMP) was established in 1997. Many efforts and activities have been conducted by the founding fathers and mothers of SEAFOMP to develop medical physics at both national and regional level. The recognition of medical physicists by the governments of the member countries is one of the goals of their efforts. The federation has conducted a survey on the current status of medical physics recognition in SEAFOMP countries, focusing on the profile of society members, medical physics education and clinical training program, as well as recognition of medical physics profession in the region. There is still a gap among medical physicists in SEAFOMP member countries. Five countries have established the role of professional society, education and training for the enhancement of medical physicists, however the recognition of medical physicists as a profession is only achieved by less than 60% of SEAFOMP member countries.**

Keywords — **medical physics, recognition, education, SEAFOMP, ASEAN.**

I. Introduction

The Association of Southeast Asian Nations, commonly referred to as ASEAN, is an organization comprising of 10 countries located in Southeast Asia. The organization was formed on 8 August 1967 in Bangkok, Thailand by its five original member countries, i.e. Indonesia, Malaysia, Philippines, Singapore and Thailand. Over the years, the organization grew when Brunei Darussalam joined in as the sixth member on 8 January 1984, Vietnam on 28 July 1995, Laos and Myanmar on 23 July 1997 and Cambodia on 30 April 1999. Its objectives include accelerating economic growth, social progress and cultural development among its members, as well as to promote regional peace [1].

The spirit of ASEAN is resounded in SEAFOMP. The idea of setting up an organization for South-east Asian medical physics societies was first mooted in 1996. During the International Organization of Medical Physics (IOMP) World Congress at Nice in 1997, the formation of SEAFOMP was endorsed by member countries. The South East Asian Federation of Organizations for Medical Physics (SEAFOMP) was officially accepted as a regional chapter of the IOMP at the Chicago World Congress in 2000 with five member countries, viz. Indonesia, Malaysia, Philippines, Singapore and Thailand. At that time, the founding members of SEAFOMP were Anchali Krisanachinda and Ratana Pirabul from Thailand, Kwan-Hoong Ng from Malaysia, Agnette Peralta from the Philippines, Djarwani S Soejoko from Indonesia and Toh-Jui Wong from Singapore. Prof. Kwan-Hoong Ng served as the founding president until 2006. Three other countries joined SEAFOMP subsequently: Brunei (2002), Vietnam (2005), Cambodia (2016), and Myanmar (2016).

The objectives of SEAFOMP are to promote (i) co-operation and communication between medical physics organizations in the region; (ii) medical physics and related activities in the region; (iii) the advancement in status and standard of practice of the medical physics profession; (iv) to organize and/or sponsor international and regional conferences, meetings or courses; (v) to collaborate or affiliate with other scientific organizations. SEAFOMP has a complementary and synergistic relationship with AFOMP in moving medical physics forward in the region [2].

II. Medical Physics Recognition

2.1. Profile of Clinical Medical Physicists in SEAFOMP Countries

A survey of medical physicist professional status; education and training as well as the recognition of medical physics profession, has been performed. The survey was conducted through the executive committee of SEAFOMP between October 2016 and March 2017. The result of this survey was presented at the track 'Capacity building in medical physics' at the International Conference on Medical Physics on 11th December 2016 in Bangkok, Thailand. This survey has updated the data which was published in previous works [3,4].

The survey data was presented in Table 1 to Table 4. Table 1 describes the profile of medical physicists in the SEAFOMP countries which consist of the members of societies include the academics, beaurocrats, product specialists and clinical medical physicists. We also refer the certified medical physicists as part of clinical medical physicists.

Table 1 shows that there are currently 1027 medical physicists serving in various aspects of medical physics in this region. Among all, 745 are clinical medical physicists who are working in clinical setting. The clinical medical physcists who are working at clinical institutions and comply with international qualification standard (eg. minimum academic qualification of master's degree) may be qualified to receive certification from international or national body. Until recently, the number of certified medical physicists (i.e. clinically qualified medical physcists, CQMP) in SEAFOMP countries is about 88 (8.5%) out of 1027 medical physicists. The table also points out the number of clinical medical physicists in the region who hold international certification (< 1%), while the remaining certified medical physicists are recognized by the respective national bodies or institutions.

Table 1. The profile of society members including clinical medical physicists and certified medical physicists

Country	Society Members	No. Clinical MedPhys	Certified-MP
Brunei Darussalam	8	8	None
Cambodia	4	4	None
Indonesia	290	161	13 (national certification)
Malaysia	266	200	1 (ABMP)
Myanmar	34	26	3 (overseas training)
Philippines	110	85	35 (national certification)
Singapore	35	31	1 (ABR), 20 (institution)
Thailand	150	150	30 (national certification)
Vietnam	130	80	5 (Overseas training)

2.2. Profile of Medical Physics Education and Training in SEAFOMP Countries

Table 2 shows that only four countries in this region offer medical physics post-graduate education by coursework (master degree), while the others offer medical physics as an elective subject or in final year's syllabus in bachelor's degree. Most of these countries do not have doctoral program in medical physics. On the other hand, some universities are beginning to consider to start medical physics postgraduate (Master's degree) coursework program as per international recommendation.

International Atomic Energy Agency (IAEA) through the Regional Technical Cooperation project in Asia Pacific (RAS6038), conducted the pilot project to initiate the clinical residency program in SEAFOMP countries, as presented in Table 3. In this project, Thailand, Philippines, Malaysia and Singapore participated with 30, 12, 14 and 3 residents, respectively. The residency clinical training program was coordinated by external coordinator who was appointed by the IAEA. These clinical residency program followed the IAEA Training Course Series (TCS) publication 37, 47, and 50. In the end of the project, 51 residents have successfully graduated from the program. Subsequently, the pilot project was continued through the new project RAS6077. This new program also followed the IAEA TCS, however it was translated to e-learning system called the Advanced Medical Physics Learning Environment (AMPLE). This e-learning system provides the possibility for residents to submit their work and the supervisor to grade their work. Table 3 also presents the data on countries that had taken part in the pilot project.

Table 2. Profile of Medical Physics Post-graduate Education (master degree and doctoral) in SEAFOMP countries

Country	No. Univerities	Estimated students /year	Qualification
Brunei	None	-	-
Cambodia	None	-	-
Indonesia	4	40	MSc, PhD
Malaysia	2	30	MSc, PhD
Myanmar	None	-	-
Philiphines	1	12-15	MSc
Singapore	None	5	PhD
Thailand	3	30	MSc, PhD
Vietnam	None	-	-

Table 3. Pilot projects in medical physics clinical residency program through RAS6038 and RAS6077

Country	Start year	No. Enrolled RAS 6038 +(RAS6077)	No. Graduated
Brunei	None	None	None
Cambodia	None	None	None
Indonesia	2016	0+ (7)	None
Malaysia	2010	14+(0)	6
Myanmar	2016	0+(2*)	None
Philippines	2009	12 + (51)	12
Singapore	2015	3 +(0)	3
Thailand	2007	30 +(29)	30

Vietnam	2016	0 +(1*)	None

*Residents of Mnyamar and Vietnam are registered in AMPLE under remote supervision by medical physicists from Thailand through RAS6077 IAEA project

2.3 Profile of Medical Physics Recognition in SEAFOMP countries

Formal recognition of medical physicists has been a major task of the SEAFOMP leadership. Numerous efforts and activities have been implemented to raise the profile of medical physics in the region. The result of the survey on formal recognition is presented in Table 4. It describes that only 5 out of 9 countries have included medical physics profession in the scope of their national regulation. It means that the recognition of medical physics profession in SEAFOMP is less than 60% of all members. This is proven to be a major challenge, underlining the need of medical physics societies at SEAFOMP countries to enhance their efforts in communicating with their governments/regulators.

Table 4 also indicates that the certification status of clinical medical physicist in the region reflects the state of recognition. On the other hand, the registration of medical physics profession has just been established in Indonesia; and Malaysia has recently begun to register the medical physicists working in clinical setting. The registration of medical physics profession in Indonesia and Malaysia are similar; both are performed under a council of allied health profession under the Ministry of Health. The clinical medical physicists who have registered as the allied health profession are required to collect a designated credit points from activities related to continuing medical education (CME). By regulation, the re-registration of clinical medical physicist in Indonesia has also been implemented in 2017. The formal requirements for re-registration of clinical medical physicists was stated by the professional society (Indonesian Association of Physicists in Medicine).

Table 4. Medical Physics recognition in SEAFOMP countries

Country	Recognition	Certification	Registration
Brunei D	Yes, Gov	None	none
Cambodia	None	None	none
Indonesia	Yes, Gov. Law 36/2014	Gov & Society	Council of Allied Health Prof. (MOH)
Malaysia	Yes, Ministry of Health (MOH)	Allied Health Professions, MOH	Allied Health Professions, (MOH)
Myanmar	None	None	none
Philippines	Yes, MOH	Society	none
Singapore	Yes, MOH	None	none
Thailand	Yes	Society	none
Vietnam	None	None	none

Table 1 to Table 4 express the gap in the medical physics infrastructure among nine SEAFOMP countries. Five have not started the medical physics education at postgraduate level as per international recomendation. Therefore it is a challenge for SEAFOMP to support and encourage the countries like Cambodia, Myanmar, Vietnam and Brunei to start the formal medical physics education program. On the other hand, Singapore offers their program as elective course in bachelor's and doctoral degree in physics because the demand of medical physcists in the country is relatively low. Most positions of medical physicists in Singapore are filled by medical physcists who are graduated from overseas.

2.4 Capacity Building of Medical Physics Activities in the Region

In order to promote scientific exchange and mutual support in the region, SEAFOMP has organized a series of congresses since her formation. SEAFOMP congresses have been held annually since its inception and these congresses have stimulated much growth and progress in medical physics in the region. The history of SEAFOMP and her role in ASEAN has been well documented [5,6].

The South East Asian Congress of Medical Physics (SEACOMP) series were held respectively in Kuala Lumpur (2001), Bangkok (2003), Kuala Lumpur (2004), Jakarta (2006), Manila (2007), Ho Chi Minh City (2008), Chiang Mai (2009), Bandung (2010), Manila (2011), Chiang Mai (2012), Singapore (2013), Ho Chi Minh City (2014), Yogyakarta (2015), and Bangkok (2016). The next SEACOMP is planned to be held at Ilo-Ilo, Philippines on 1-3 December 2017.

Furthermore, the ASEAN College of Medical Physics (ACOMP) has been launched on 24 October 2014 at the 14th SEACOMP in Ho Chi Minh City, Vietnam [7]. The vision of ACOMP is to make it the premier education and training centre for medical physics in ASEAN region and beyond. The first activity of ACOMP was held in Malaysia on 11-14 November 2015 in conjuction with the AAPM/ISEP workshop on Medical Imaging. The second activity was held at Kuala Lumpur, Malaysia on 5-6 August 2016 with focous on Safety, Optimization, Dosimetry and Quality Control in Interventional Radiology. The third activity was held in conjuction with the 13th SEACOMP on 10 December 2015 at Yogyakarta, Indonesia. Recently, the forth activity was held in conjunction with the International Conference on Medical Physics (ICMP) at Bangkok, Thailand on 11 December 2016. The next upcoming ACOMP event will be the "School on Monte Carlo" from 10 - 14 July 2017, which is organized by the Institut Teknologi Bandung, Indonesia in collaboration with Indonesian Association of Physicists in Medicine. Beside the congresses and ACOMP activities, the medical physics capacity building in the region has been initiated to enhance the academic environment, such as external examiner exchange for master thesis and the students exchange.

In order to establish the scientific achivement in the region, the committees have also initiated joint research or

publication for two or more institutions to produce the scientific papers and publish in high impact journals. For example, the collaboration activity has been initiated between Universitas Indonesia with University of Malaya and Katholieke Universiteit Leuven. In addition, Institut Teknologi Bandung has also intiated collaborations between California State University and University of Kyushu to work together on joint research and publication.

To enhance the achievements of medical physics development in the region, the committee planned to establish an exchange program for external assesors of clinical residency program; sharing clinical supervisors among SEAFOMP residents; enhancing ACOMP activity as continuing professional development; and establishing travel grant schemes for young medical physicists to attend the regional medical physics activities.

III. Conclusions

The recognition of medical physics profession in SEAFOMP countries varies according to the respective governments. Although such recognition is still less than 60% (out of nine countries), the number and scale of activities for medical physicists, nationally or regionally, has been increasing and proven to be a channel to accelerate the recognition in all SEAFOMP countries. SEAFOMP is now paying special attention to advance the development of medical physics profession in the region, especially for Vietnam, Cambodia, Myanmar and Brunei Darussalam.

Acknowledgment

We would like to thank all the founders of SEAFOMP and ACOMP for their tireless dedication in accelerating the recognition of medical physics profession in national and international arena.

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ANNEX

The list of postgraduate program in Medical Physics at SEAFOMP countries

Country	University Name	Person in Charge	Website and contact
Indonesia	Universitas Indonesia	Dr. Supriyanto Ardjo Pawiro	http://magister.fisika.ui.ac.id Email: supriyanto.p@sci.ui.ac.id
	Diponegoro University	Dr. Wahyu Setia Budi	http://www.mif.undip.ac.id/ Email: wahyu.sb@fisika.undip.ac.id
	Bandung Institute of Technology	Dr. Freddy Haryanto	http://www.fi.itb.ac.id Email: freddy@fi.ui.ac.id
	Brawijaya University	Dr. Johan Noor	http://fisika.ub.ac.id Email: jnoor@ub.ac.id
Philippines	University of Santo Tomas	Agnette Peralta, MSc	http://graduateschool.ust.edu.ph/wp-content/uploads/2014/10/medphysics_2015.pdf Email : apperalta2004@yahoo.com
Malaysia	University of Malaya	Dr. Jeannie Hsiu Ding Wong	https://www.um.edu.my/academics/master/medicine/master-of-medical-physics Email : jeannie.wong@ummc.edu.my
	Universiti Sains Malaysia	Dr. Norlaili Ahmad Kabir	http://www.ips.usm.my/index.php/article-coursework/190-master-of-science-medical-physics Email: norlailikabir@usm.my
Thailand	Chulalongkorn University	Dr. Anchali Krisanachinda	http://w.md.chula.ac.th/radiology/program/program.php Email: kanchali@chula.ac.th
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	Chiang Mai University	Dr.Narongchai Asavapromporn	http://www.med.cmu.ac.th/dept/radiology/Rad/learn.htm Email: nncnchawapu@mail.med.cmu.ac.th