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## IFMSA Policy Document Access to Research & Research Education

**Proposed by Team of Officials**

**Adopted by the IFMSA General Assembly March Meeting 2019, in Portorož, Slovenia.**

### Policy Statement

#### Introduction:

Biomedical research has been an essential component of science for millennia. Whether to produce new medicines, to determine whether a treatment is effective, to identify causation or to answer the most difficult questions, research has contributed to the progress of all biomedical sciences and subsequently, to the progress of society. Between the 19th and the 21st century, mean life expectancy has skyrocketed from 30 years to 72 years in 2013, attributed largely to the findings and outputs of scientific research. However, 51.1% of the global research output is derived from the European Union and the United States alone, while they only represent approximately 11.3% of the world population, therefore highlighting severe discrepancies in access and resources.

#### IFMSA position:

The IFMSA, recognizing the importance of research for Universal Health Coverage and the progress of society, affirms its stance that medical students everywhere should have access to research and research education during their undergraduate studies, under the proper guidance of experienced tutors. These should include ethical practices and benefit versus harm, evidence-based medicine, understanding and being able to employ research methodologies, capacities to read and interpret research findings and scientific papers, as well as develop their critical thinking and academic writing skills as future health professionals. The IFMSA also affirms that research with minimal resources should be included in curricula worldwide, not only to develop ingenuity among students, but also to provide students with the right skillset to execute scientific activities when funding and resources are scarce.

#### Call to Action:

The IFMSA calls on Governments to:

- Allocate funds to national research systems, that have the capacity to set research priorities based on global and local health problems.
- Consider research when making health policies and practices, and to follow up on the outcomes and impact.
- Support and encourage schools worldwide to incorporate research in the curricula to address its importance in the societies development and reaching UHC.
- Work together with educational institutions, whether they receive government funding or not, to develop local and national frameworks to ensure a transparent and open research society.

The IFMSA call on International Organizations (such as WHO) to:

- Establish and encourage regional and global networks for information-sharing and collaboration between researchers.
- Help countries implement all norms and standards according to the WHO Code of Conduct for Responsible Research.



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- Develop platforms for dialogue between researchers and policy-makers by contributing to the research translation process.
- Promote and maximise open access to health-related research results.
- Endorse IFMSA Research Exchanges

The IFMSA calls on Medical Universities to:

- Include Research Education in the medical curriculum as a mandatory topic.
- Offer all medical students the opportunity to undertake independent research projects, not failing to provide them with the appropriate supervision and encouragement.
- Facilitate the contact between different students, researchers and research centres in order to promote inter collaborations, dissemination of information and sharing of resources.
- Encourage faculty members to assist and mentor medical students on their research.
- Recognize IFMSA Research Exchanges as part of the medical curriculum.
- Support IFMSA Research Exchanges with both human and logistical resources.
- Develop links that are maintained beyond the student's visit such as institutional partnerships, in order to support long-term bilateral collaborations.

The IFMSA calls on its National Member Organizations to:

- Implement a bilateral Research Exchange Program accessible to all medical students.
- Encourage the implementation of Standing Committee on Research Exchange (SCORE) and Standing Committee on Medical Education (SCOME) joint initiatives.
- Work together with educational institutions to ensure a sustainable collaboration.
- Advocate to universities for research courses in medical curricula.
- Advocate to universities for the participation of medical students in research projects.
- Organize local and national Research Camps to promote research education for medical students.
- Be part of international SCORE campaigns.
- Organize local and national SCORE campaigns to promote research among medical students.
- Actively support SCORE exchanges through for example economic and material support.
- Support NMOs with less developed research facilities by participating in initiatives such as SCOPE/SCORE exchange.



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## Position Paper

### Background information:

Biomedical research has been an essential component of science for millennia. Whether to produce new medicines, to determine whether a treatment is effective, to identify causation or to answer the most difficult questions, research has contributed to the progress of all biomedical sciences and subsequently, to the progress of society. Between the 19th and the 21st century, mean life expectancy has skyrocketed from 30 years to 72 years in 2013 [1], attributed largely to the findings and outputs of scientific research. However, 51.1% of the global research output is derived from the European Union and the United States alone, while they only represent approximately 11.3% [2][3] of the world population, therefore highlighting severe discrepancies in access and resources.

There is no denying that research has brought about improvements to quality of life, making it an important tool in humanity's development all around the globe. However, when it comes to access to research, we are found with a big chasm between populations and all research that is being done, let alone published. This is because doing research and publishing it are two different things, and because the current costs of publishing scientific articles pose a threat to junior researchers trying to make way in their field. This is shown in numbers, with the cost per article in a traditional, non-Open Access scientific journal being between 3,500 and 4,000 US\$ [4], and an Open Access one between 1,350 and 2,250 US\$ [4]. This is already a great filter, where a considerable part of the research done is never published. Secondly, there's the price paid to access these articles, where traditional health science journals in 2017 had a 44.8% increase in the average price from the previous year [5].

These are walls that not only health professionals, but also students in the Health Sciences face and struggle with year after year, resulting in discouragement and distancing from Research (mostly) due to financial impossibilities.

### Discussion:

#### Why is research important for Universal Health Coverage (UHC)?

Research is not only a tool to achieve UHC, but a necessity. One of the most famous examples of the continuous interaction between research and UHC is the 1990 landmark report from the Commission on Health Research for Development [6]. This study concluded that less than 10% of the research spending was targeted at diseases accounting for more than 90% of the global burden of ill-health, initiating new recommendations and thorough monitoring processes.

This problem was addressed in the WHO's 2013 World Health Report - Research for Universal Health Coverage - where several case studies are displayed, highlighting the range of study designs that can be used in research for health. In one case study, a meta-analysis[7] from 22 sub-Saharan African countries found that owning at least one insecticide-treated mosquito bed net (ITN) resulted in a 23% mortality reduction in children under five years. This research does not only show the importance of ITNs, but also reinforces the benefit of current investments and programs for ITNs. This study, amongst many others, ranging from systematic reviews to randomized control trials, answers questions but also leads to new questions. It also shows that research interacts with new policies and practices.

Achieving Universal Health Coverage needs a broad look at determinants of health and disease, both within and outside of the health sector. UHC also includes financial risk protection, ensuring social protection and protecting against financial difficulties. Further research is necessary in order to assess policies in all sectors affecting health. According to the WHO, research should not only take place in academic centres but also be used in public health programmes in order to meet the demand for health services. Finding local answers is also a crucial step in achieving UHC, as the epidemiological



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profile of each population is different [8]. Therefore, each country should be a producer and a consumer of research.

In another study, from a country with a robust current health insurance system which has achieved over 96% [9] health insurance coverage, China, a cross-sectional survey of social health insurance managers was conducted and the findings proved that research also needs to be conducted regarding the benefits that the insurance programs bring to their members, in order to abolish healthcare inequality. This requires functional national research systems, where research priorities and limited funds are set according to the local health problems in all health related aspects. The WHO recommends developing countries to allocate 0.05-0.1% of their GDP for government-funded health research, whereas that number increases to 0.15-0.2% for high-income countries [10]. For-profit research companies also play an important role, as collaborations between the private and public sector are growing in the need for new technologies.

### How accessible is research throughout the world?

One of the hardest questions to answer is how accessible research is around the world. There are insufficient studies focusing on how accessible research is in different countries. The vast majority of all research traditionally comes from Europe, which can be concluded from United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics. However, according to a study made by the Britain's Royal Society, citations from the already established academic countries like US, UK, Germany, France are declining and more citations are coming from developing economies. Statistics also show that from all published scientific reports between 1999-2003, 30%, was published by countries outside the top ten countries publishing, the same number between 2004-2008 was 34% [11].

The "UNESCO Science Report 2010: The current status of science in the world" clearly shows the unequal distribution of research throughout the world, with the Science Citation Index as main indicator. While science and technology used to be dominated by the Triad (USA, Europe & Japan), countries in South America and Asia are on the rise. Europe and USA have seen their world share slowly drop to 34 and 28% respectively, while China has doubled their citation rate to 10%. This makes place for BRIC (Brazil, Russia, India and China) countries, who have seen tremendous growth in recent years. Besides Brazil, the rest of Latin America is still modest with a total share of 4.9%. Africa's share of publications grew to 2%, especially thanks to South Africa. These numbers demonstrate that scientific publications are still dominated by Europe, USA and Asia, while other countries are slowly making progress.

According to the "World Health Report 2013: Research for universal health coverage" research in Africa grew at a rate of 5.3% per year between 1990 and 2009. However, in the final five years the growth was higher, namely 26% per year, demonstrating the stimulation of research productivity in Africa in the latest years. Still most of the African countries, except for Ghana and South Africa, have little research capacity. A 2010 [12] study showed that research funding is slowly increasing in low-income countries such as sub-Saharan countries, but that globally only 4% of publications in health policies and systems research came from an author from a low-income country.

This is something we can also see in our SCORE Research Exchange Program, with only 6 out of 19 countries being active in IFMSA African region.

In Asia, studies [13] have observed that China and other emerging economies has put a lot of importance on investments in Research & Development, with a growth of 5% per year faster than the economic output.

### Responsible Research and Innovation

In recent years, the social responsibility of research has entered the global discourse, particularly prompted by the launch of the European Commission's Science in Society Programme within Horizon 2020[14]. Responsible Research and Innovation has been defined as an approach to science that anticipates and assesses potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation [15].



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Good science refers to more than just competent researchers with integrity, encompassing science that is good for society and benefits citizens as well as the planet. The Uppsala Code of Ethics for Scientists [16] emphasizes the expectation that scientists will pay attention to the health, safety, and welfare of the public and the environment. Researchers have a dual role of responsibility: towards the society as citizens and towards the scientific community as its representative members. It must be acknowledged that while it is funding that directs how research is used in terms of ethics, rather than the scientists, they still have the choice of what research projects to work on, including oversight, direction the research takes, educating the public and other researchers in responsible practices and using their expertise to influence research and public policy. [17]

Researchers are integral members of their communities and carry the responsibility to serve society through their work. While global statistics on research funding are lacking, at least in the United States the largest portion of Biomedical Research is government funded [27], therefore posing a main argument in for the social responsibility of science, yet not the only one. Research, like medicine, carries an implicit social contract, meaning that it should be undertaken for society and towards society's needs and it should also take into consideration its potential impacts both for the citizens and the environment. [28]

The education of medical students and future scientists should be embedded in the principles of Responsible Research, as well as Research Ethics. Moreover, according to the Framework for Qualifications for the European Higher Education Area (EHEA), students at the third cycle of education (corresponding to the doctoral level), should "have demonstrated the ability to conceive, design, implement and adapt a substantial process of research within scholarly integrity.". [29] Ultimately, scholarly integrity comprises of both social responsibility and responsible research.

### Principles of Research Education

As the curriculum of medicine field is ever-growing and always updating, it is crucial for a health-care professional to provide an integrated approach of clinical and evidence based medicine to provide better patient-care. Knowing the correct techniques and methodologies of a systematic research, would not only help a health-care student or professional extract the most knowledge out of the vast literature available, but also contribute to that literature and society.

Evidence based medicine is "the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients." It promotes the use of the available external clinical evidence and integrating it with the individual clinical expertise that is obtained with the help of clinical experience. Its role has been appreciated in clinical decision making in a number of diagnostic and prognostic scenarios. Furthermore, as it includes the review of various randomized controlled trials, it has been considered as the "Gold Standard" in judging the risk and benefits of various treatments [18].

In the recent years, Evidence based medicine has gained impetus and its positive impacts are beginning to receive validation [19][20]. Besides its wide use in the practice of medicine it continues to hold a lot of promise in the conduction of high quality researches that address important questions of current relevance. Hence, to ensure the continual growth of quality literature on healthcare subjects, it is important that medical students are well aware of the implications of evidence based medicine.

Besides evidence based medicine, it is important to know the various elements that help a researcher formulate a valid and important research question. These elements help the investigator to gauge his available resources and anticipate an outcome.

One method to describe the various elements, named FINER, are explained below [21]:

1. **Feasibility:** This helps the researcher to gauge if the research being undertaken is actually something that can be completed. It helps the researcher introspect if they have the required equipment, resources, participants, time and scope to complete the investigation. It helps the investigator stay realistic.



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2. **Interesting:** Research is an eventual result of undying curiosity. To complete a research one needs to have immense amount of intrinsic motivation and willpower that would only be fostered if the topic-at-hand is considered interesting.
3. **Novel:** It is important that the findings of a research conducted are in some way contributory and expands the current literature available. 'Novel' helps an investigatory to ensure that the research is filling a certain "gap" that is currently present in the available literature about a particular topic.
4. **Ethical:** This helps to ascertain that the basic human rights and moral code of conduct is always followed when conducting research. It ensures that the investigator gives forethought to the consent., safety, benefits, risks, autonomy and confidentiality of the participants.
5. **Relevant:** As discussed above, research contributes greatly in the diagnosis, prognosis and therapeutics of a disease. Hence it is important that a research conducted holds a current relevance and a direct positive impact in the upliftment of healthcare. This helps to confirm that the results of the study would help 'improve' the current conditions.

With the appreciation of evidence based medicine and the knowledge of the above mentioned principles, great contributions can be made in the upliftment of the current healthcare scenario, especially if these principles are inculcated right from medical-school.

### IFMSA and Research Education

Research is essential for the development of medicine and without it, the medical field could never have reached the stage it is at now with innovative methods of diagnosis and treatments. Unfortunately, many medical students do not have the opportunity to experience research while they are in medical school. The International Federation of Medical Students' Associations (IFMSA) Research Exchange Program, coordinated within Standing Committee On Research Exchange (SCORE) on international, national and local levels, was founded 1991. This program was designed to enable medical students worldwide from the different IFMSA National Member Organizations (NMOs) to take part in research projects abroad under the guidance of supervising tutors. This program is purely educational for students and has the mission of offering future physicians an opportunity to experience research and diversity in countries all over the world. Aiming to develop both culturally sensitive students and skilled researchers intent on shaping the world of science SCORE and its global network of volunteer medical students collaborating, SCORE has run a program with more than 83 active NMOs, 3000 research projects and over 2400 medical students participating yearly worldwide. IFMSA provides medical students with the opportunity to deepen their knowledge in the specific area of their research interest.

The academic recognition of the research exchange program varies among medical schools. Some universities recognize exchange projects as a part of their curriculum and some universities award their exchange students with academic credits. There are cases where the program is officially recognized and supported by the medical school/university and is guided by a mentor who introduces exchange students to the basic principles of research, including literature search, data collection, scientific writing, laboratory work, statistics, and ethics. Additionally, IFMSA Research Exchange Program is endorsed by several institutions such as, The World Federation on Medical Education (WFME) which recognized the IFMSA Research Exchange Program to be a professionally organized and absolutely worthy of endorsement and of being recommended to medical schools/faculties worldwide program, the International Federation of Gynecology and Obstetrics (FIGO) and the World Federation of Neurology.

Research Projects are the core of the IFMSA Research Exchange program. The projects are designed to deepen the medical student's knowledge in the various medical fields while introducing them to different approaches to clinical investigation, medical education and ethical research standards. SCORE provides 3 types of projects: basic science research project (lab work, literature study), clinical research project with lab work (studying a highly specific clinical topic combined with basic research in lab), clinical research projects without lab work (investigating a highly specific



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clinical topic in a data collecting, clinical setting). In addition to these three types of projects there is one that provides the students with a unique research experience: Global Action Project (GAP).

The Global Action Project aims to fill the void between knowledge and awareness. It encourages future health professionals to learn the necessary skills for prevention, detection and treatment of endemic diseases or diseases that affect the majority of the population in a country. Through a four-week intervention program, students reinforce basic research skills in special circumstances, gain theoretical knowledge on diseases which are not studied deeply in their own countries, and through fieldwork, they experience the way these diseases are handled in their native environment. Students are also involved in the development of health promotion programs.

The research exchange projects are designed to incorporate foreign medical students for a defined period of time (from 4 to 8 weeks) into a research team under the supervision of a tutor. The student will be guided through the basic principles of research such as literature studies, collecting information, scientific writing, laboratory work, statistics and ethical aspects related to their discipline. For better efficiency of the program, the student can be required to choose the research project in the field of medicine which he/she has already studied at his/her university. Previous research performed in that field of medicine can also be beneficial, especially when the topic of the research project is not covered by the home curriculum. Preparation and basic literature reviews about the topic of the research project before the start of the exchange are also welcomed and encouraged.

IFMSA Research Exchange Program not only introduces health care students from all around the world to the basic principles of medical research, but also widen their horizons, provide them the opportunity to experience different approaches to health care, ethical research standards, medical research, education and treatment, enhance the academic quality of their medical curricula, achieve educational benefits of practical and theoretical knowledge in the field of medical research and cultural competence and most importantly enable them to take responsibility for their own learning according to their personal interests.

### Benefits of exposing medical students to Research

One of the biggest limitations that medical students have is their lack of exposure to doing undergraduate research. According [23] to several authors, the reasons that prevent students from participating in research activities range from lack of student awareness, to physical infrastructure deficits and unmotivated university staff, with some emphasis on ineffective institutional incentives to conduct undergraduate research. Research [24] in the medical curriculum is usually optional in developed countries such as the United States or Great Britain where, if the student is motivated and decides to develop their hypothesis, they can succeed in initiating a research project. Likewise, if it is linked to a project that is being carried out by residents or teachers, it can achieve the same objective. In most of these cases, the main focus is on the student and his or her own curiosity so that he or she can find a project to link to and carry out. In Germany, for example, medical students have a requirement to obtain a medical degree to have done research during undergraduate studies. [24] Statistics show that around 70% of students perform their research during their career or in boarding school to obtain a medical degree. In this same study it was shown that about 66% [24] of the students published their research papers in indexed journals]. The latter leads us to think that the researches carried out by these students are of good quality, since they managed to get the publication of their work in indexed journals avoiding the difficult process of academic "peer review" of each of the journals.

Research is one of the most important pillars on medical formation; without it, there wouldn't be new findings on new diseases, treatments, comparing different procedures, and in general, no new health advances that can help provide and implement global health. There [25] are medical schools around the world where research programs have been developed since 1960s in order to provide students the skills that will contribute in their formation. Those [23] in favor of mandatory disciplines believe that the benefits of undergraduate research extend well beyond the limits of interpreting literature articles, providing an entire skills set that students can acquire in the development, implementation and



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dissemination of scientific work, redefining this activity as a tool of medical education to construct a new profile of the health professional.

According to different studies [25], medical students from different research programs felt that research allowed them to experience and develop both, interpersonal and research-specific skills, such as having an increased sense of confidence when formulating research questions, understanding methodology, conducting projects, learning new techniques, analyzing data, writing manuscripts, and critically appraising published literature. The same studies affirm that after finishing their research projects, medical students perceive that their experiences contributed to their career progression, helped them define their career paths and select their specialties, increased their confidence regarding placing in their desired residency positions, and provided an opportunity to integrate and apply their findings into their practice. Carrying [24] out research as a student and disseminating the results, especially in indexed publications, subsequently influences teacher recruitment, job promotion, salary, academic recognition and scientific reputation. Individuals [23] who participate in research activities during undergraduate education, including future non-researchers, develop leadership skills that enable local/regional action in the context of their profession and specialization, even having improved communication skills, critical analysis and being successfully selected in programs for postgraduate studies/medical residencies, as well as achieving academic and/or professional titles faster. A less direct benefit [26], and one that is more difficult to teach in the undergraduate curriculum, is the balance between independence and collaboration. Research is often performed in teams, and one must learn to balance a collaborative effort in the laboratory with what one is capable of accomplishing independently. Interdisciplinary work is difficult to teach in the classroom, and on-the-job experience with teams is a bonus for any workplace environment. The nature of research today is such that interdisciplinary teams are becoming the norm, and gaining firsthand experience in teamwork should be promoted in the undergraduate education.

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