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Who is Who - Current Scientific Impact of the Medical Staff Affiliated at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia

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Abstract

Aim. The aim of this study was to investigate current individual scientific impact of the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia and to create a list of Top Ten Scientists.

Material and methods. One hundred thirty nine members of the academic staff employed at the institutes, Faculty of Medicine in Skopje, Republic of Macedonia were analysed with *Harzing's Publish or Perish* software for their current individual scientific impact (October, 2009).

Results. Gordana Petrushevska from the Institute of Pathology is on the first place of Top Ten Scientists list, Aleksandar Petlichkovski from the Institute of Immunobiology and Human Genetics is on the second place, Dragica Zendelovska from the Institute of Preclinical and Clinical Pharmacology with Toxicology is on the third place, Ljudmila Efremovska from the Institute of Medical and Applied Physiology is on the fourth place. Fifth place on the Top Ten Scientists list belongs to Mirko Spiroski from the Institute of Immunobiology and Human Genetics, the sixth place to Ljiljana Bozhinovska from the Institute of Medical and Applied Physiology, the seventh place to Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry, the eight place to Dejan Trajkov from the Institute of Immunobiology and Human Genetics, and the ninth and the tenth places share Emilija Janevic-Ivanovska from the Institute of Pathophysiology and Nuclear Medicine and Doncho Donev from the Institute of Social Sciences.

Conclusion. The Top Ten Scientists list comprising only members from the Institutes of the Faculty of Medicine has three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member from each of the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and Institute of Social Sciences.

Introduction

Scientific impact of the academic staff employed at the Institutes, Faculty of Medicine in Skopje is a necessary measure of one's position on the scientific scale. It also serves as a driving force for continuous increase of the science as a whole at the Faculty of Medicine. Scientific activities of the Faculty of Medicine in Skopje were analysed (SWOT analysis) and some conclusions were made (1).

Current scientific impact of the Institutes at the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia was examined and it can be described as very heterogeneous - with higher, intermediate and low

scientific rate. The institutes with higher scientific impact are: Institute of Medical, Experimental and Applied Physiology with Anthropology; Institute of Immunobiology and Human Genetics; and Institute of Medical and Experimental Biochemistry (2).

On the other hand Macedonian medical journals have very limited scientific influence and their Editorial Boards are obliged to improve quality of their published manuscripts, and to adhere to international standards for scientific journals, which will result in their greater visibility and scientific influence (3).

Faculty of Medicine in Skopje needs deep structural reforms in the field of science along with other reforms in education and health protection in order to be prepared for integration in the European Union and to be a leader of the health system in the Republic of Macedonia.

The aim of this study was to investigate current scientific impact of the members of the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia and to create a list of Top Ten Scientists.

Material and Methods

Academic staff at the Institutes, Faculty of Medicine

Academic staff was analyzed (139 employees) with regard to their scientific impact they have made as members of the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia. Description of the Institutes and definition of academic staff were previously published (2).

Software for Citation Metrics Analysis

This research compares the current individual scientific influence of the academic staff employed at the Institutes of the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia. Data for the research were obtained online (October, 2009) from the public domain, using the *"Harzing's Publish or Perish"* software program (ver. 2.7.3499, 2009.07.30.1216U, WinNT (x86) Unicode) that retrieves and analyses academic citations of different academic authors or journals all over the world (4). The software makes use of Google Scholar to obtain the raw citation scores of various search types: author impact analysis; journal impact analysis; and general citation search (5).

Search Strategy

Author impact analysis page was used to perform an *Advanced Scholar Search* query and to analyse its results. Several problems arise when author impact analysis search is used: i) some authors have used different names in different periods of time (Koceva Marija or Papazova Marija); ii) some authors transliterate their names in several different ways (Petrusevska G or Petrushevska G); iii) some authors add or do not add "v" (Spiroski M or Spirovski M); iv) some authors use only one of their two surnames (Korneti-Pekevska K as Korneti K). As a results, official names of the authors affiliated with different Institutes (2) and names of the authors in the current author impact analysis are not identical.

Harzing's Publish or Perish software uses these parameters to perform a Google Scholar query. If the list of results contained similar authors from different institutions (Nikolic S, for example), citations were manually excluded from the analysis by checking or clearing the boxes in the Results list. The results are available on-screen and can also be copied to the Windows clipboard (for further applications) or saved to a text file (for future reference or further analysis) (4).

The software then analyses these results and presents a large array of statistics. For the purpose of this study, we used: (i) total number of papers, (ii) total number of citations, (iii) Hirsch's h-index, (iv) Egghe's g-index, and (v) e-index (5). Definition of the obtained statistics was previously published (2). Obtained values were transformed into rank (rank papers, rank citations, rank h-index, rank g-index, and rank e-index) with average calculation of mean rank, which serves as a scientific scale for the position of each member of the academic staff (5).

Results

The current number of published papers, rank papers, number of citations, rank of citations, h-index, rank of h-index, g-index, rank of g-index, e-index, rank of e-index, and scientific position (mean rank) by the academic staff employed at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Republic of Macedonia, are shown in Tables 1-13.

The biggest number of papers has been

Table 1: Current scientific impact of the medical staff affiliated at the Institute of Anatomy (IA), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=13)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Korneti-Pekevska Kostadina	5	23	1	37	1	7	1	11	0.00	26	20.80
Tosovska-Lazarova Dobrila	3	25	1	37	1	7	1	11	0.00	26	21.20
Koceva (Papazova) Marija	2	26	0	38	0	8	0	12	0.00	26	22.00
Strateska-Zafiroska Angja	1	27	1	37	1	7	1	11	0.00	26	21.60
Janevska-Nakjeva Natasha	2	26	0	38	0	8	0	12	0.00	26	22.00
Jurkovic Dragica	0	28	0	38	0	8	0	12	0.00	26	22.40
Matveeva Niki	3	25	1	37	1	7	1	11	0.00	26	21.20
Jovevska Svetlana	2	26	0	38	0	8	0	12	0.00	26	22.00
Zhivadinovic-Bogdanovska Julija	6	22	1	37	1	7	1	11	0.00	26	20.60
Zafirova Biljana	6	22	0	38	0	8	0	12	0.00	26	21.20
Trpkovska Biljana	1	27	0	38	0	8	0	12	0.00	26	22.20
Chadikovska Elizabeta	1	27	0	38	0	8	0	12	0.00	26	22.20
Bojadzhieva Biljana	1	27	0	38	0	8	0	12	0.00	26	22.20

published by the following three members of the academic staff from the Institute of Anatomy, Julija Zhivadinovic-Bogdanovska (6), Zafirova Biljana (6), and Kostadina Korneti-Pekevska (5) with only one cited paper. None of the academic staff from this institute has value for the e-index (zero value). The current mean rank position of the academic staff at the Institute of Anatomy is very low, and they are on the 21st to 22nd position (Table 1).

The academic staff from the Institute of Histology and Embriology has published only one paper which is not cited, and none has h-index, g-index and e-index (zero value). That is why, the academic staff from this Institute is on the bottom of the scientific scale (23rd place) (Table 2).

Table 2: Current scientific impact of the medical staff affiliated at the Institute of Histology and Embriology (IHE), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=8)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Milenkova Liljana	0	28	0	38	0	8	0	12	0.00	26	22.40
Kirovska Gracilija	0	28	0	38	0	8	0	12	0.00	26	22.40
Kostovska Nevena	0	28	0	38	0	8	0	12	0.00	26	22.40
Mitevska Elida	1	27	0	38	0	8	0	12	0.00	26	22.20
Kakasheva-Mazhenkovska Lena	1	27	0	38	0	8	0	12	0.00	26	22.20
Gerasimovska Zorka	1	27	0	38	0	8	0	12	0.00	26	22.20
Milenkova Snezhana	0	28	0	38	0	8	0	12	0.00	26	22.40
Petrova Irena	0	28	0	38	0	8	0	12	0.00	26	22.40

Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry takes the first place at with 29 published papers, 43 citations and mean rank of 7.40. Three other members from this Institute are around the 10th place (Danica Labudovic, Sonja Alabakovska,

Table 3: Current scientific impact of the medical staff affiliated at the Institute of Medical, Experimental and Applied Biochemistry (IMEAB), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=13)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Dzhekova-Stojkova Sloboda	29	8	43	10	3	5	6	6	5.10	8	7.40
Todorova Bojana	19	13	42	11	5	3	6	6	3.46	15	9.60
Korenti Petraki	19	13	27	16	3	5	4	8	2.00	22	12.80
Efremovska-Aaaron Snezhana	16	15	28	15	4	4	5	7	3.00	18	11.80
Krstevska Marija	19	13	20	20	2	6	4	8	3.46	15	12.40
Labudovic Danica	29	8	35	13	4	4	5	7	4.00	13	9.00
Bosilkova Gordana	16	15	18	22	2	6	4	8	3.46	15	13.20
Bogdanska Jasna	9	19	31	14	3	5	4	8	4.36	11	11.40
Alabakovska Sonja	25	10	38	12	4	4	5	7	4.00	13	9.20
Tosheska-Trajkovska Katerina	21	12	26	17	3	5	5	7	3.46	15	11.20
Brezovska-Kavrakova Julijana	1	27	0	38	0	8	0	12	0.00	26	22.20
Cekovska Svetlana	1	27	0	38	0	8	0	12	0.00	26	22.20
Kostovska Irena	1	27	1	37	1	7	1	11	0.00	26	21.60

Table 4: Current scientific impact of the medical staff affiliated at the Institute of Medical and Applied Physiology (IMAP), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=15)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Bozhinovska Liljana	35	5	75	6	4	4	8	4	6.24	6	5.00
Antevska Vaska	2	26	0	38	0	8	0	12	0.00	26	22.00
Maleska-Ivanovska Vesela	9	19	8	30	2	6	2	10	1.73	23	17.60
Efremovska Ljudmila	33	6	150	4	6	2	12	3	9.59	3	3.60
Nikolikj Slobodan	4	24	5	33	2	6	2	10	1.00	25	19.60
Petrovska Sunchica	2	26	4	34	1	7	2	10	1.73	23	20.00
Dejanova Beti	3	25	5	33	2	6	2	10	1.00	25	19.80
Todorovska Lidija	5	23	3	35	1	7	1	11	1.00	25	20.20
Manchevska Sanja	7	21	3	35	1	7	1	11	1.41	24	19.60
Pluncevikj-Gligorovska Jasmina	0	28	0	38	0	8	0	12	0.00	26	22.40
Sivevska-Smilevska Elizabeta	1	27	3	35	1	7	1	11	1.41	24	20.80
Mickoska-Handzhiska Eli	1	27	4	34	1	7	1	11	1.73	23	20.40
Kandikjan-Kochmanova Pepica	3	25	0	38	0	8	0	12	0.00	26	21.80
Dadikj-Nikoloska Elizabeta	3	25	0	38	0	8	0	12	0.00	26	21.80
Pavlovska Kristina	0	28	0	38	0	8	0	12	0.00	26	22.40

and Bojana Todorova) with mean rank of 9.00, 9.20, and 9.60 respectively. The next six members of the academic staff from this Institute are in the middle of the scientific scale (11th to 13th place) and the remaining members have published at least one paper (Table 3).

Table 5: Current scientific impact of the medical staff affiliated at the Institute of Immunobiology and Human Genetics (IIBHG), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=6)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Spiroski Mirko	85	1	106	5	5	3	8	4	5.58	7	4.00
Trajkov Dejan	29	8	49	9	4	4	6	6	4.36	11	7.60
Petlichkovski Aleksandar	48	3	199	3	6	2	13	2	11.66	2	2.40
Efinska-Mladenovska Olivija	18	14	38	12	3	5	6	6	4.69	9	9.20
Sibinovska Olgica	5	23	6	32	1	7	2	10	2.00	22	18.80
Hristomanova Slavica	3	25	3	35	1	7	1	11	1.00	25	20.60

Two members of the academic staff from the Institute of Medical and Applied Physiology belong to the list of the first top ten scientists. Ljudmila Efremovska from this Institute is on the first place with 33 published papers, 150 citations and mean rank of 3.60. The second place from this Institute belongs to Ljiljana Bozhinovska with 35 published papers, 75 citations and mean rank of 5.00. The second group of academic staff (Vesela Maleska-Ivanovska, Slobodan Nikolic, Sanja Manchevska, Beti Dejanova, and Suncica Petrovska) is placed around the 20th place, and the remaining members took the 21st and 22nd place. Two members of the academic staff have not published any papers (Jasmina Pluncevic-Gligorovska and Kristina Pavlovska) (Table 4).

Three members of the academic staff from the Institute of Immunobiology and Human Genetics belongs to the Tot Ten Scientists list (Aleksandar

Table 6: Current scientific impact of the medical staff affiliated at the Institute of Pathology (IP), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=12)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Stojanovikj-Tolovska Miljana	5	23	0	38	0	8	0	12	0.00	26	21.40
Bogoeva Biljana	16	15	5	33	1	7	2	10	2.00	22	17.40
Petrushevska Gordana	62	2	244	1	6	2	15	1	12.85	1	1.40
Spasevska Liljana	7	21	0	38	0	8	0	12	0.00	26	21.00
Duganovska Snezhana	3	25	0	38	0	8	0	12	0.00	26	21.80
Janevska Vesna	21	12	3	35	1	7	1	11	1.41	24	17.80
Kochmanovska-Petreska Svetlana	2	26	0	38	0	8	0	12	0.00	26	22.00
Ristovski Milcho	5	23	0	38	0	8	0	12	0.00	26	21.40
Kostadinova-Kunovska Slavica	11	17	2	36	1	7	1	11	1.00	25	19.20
Jovanovikj Rubens	5	23	2	36	1	7	1	11	1.00	25	20.40
Filipovski Vanja	7	21	24	18	3	5	4	8	3.87	14	13.20
Bogdanovska Magdalena	1	27	0	38	0	8	0	12	0.00	26	22.20

Table 7: Current scientific impact of the medical staff affiliated at the Institute of Microbiology and Parasitology (IMP), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=13)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Panovski Nikola	22	11	16	23	2	6	3	9	2.45	20	13.80
Petrovska Milena	14	16	7	31	2	6	2	10	1.00	25	17.60
Popovska-Jovanovska Kakja	2	26	0	38	0	8	0	12	0.00	26	22.00
Trajkovska-Dokikj Elena	3	25	0	38	0	8	0	12	0.00	26	21.80
Jankoska Gordana	4	24	0	38	0	8	0	12	0.00	26	21.60
Kotevska Vesna	5	23	2	36	1	7	1	11	1.00	25	20.40
Cekovska Zhaklina	10	18	2	36	1	7	1	11	1.00	25	19.40
Kaftandzhieva Ana	6	22	8	30	1	7	2	10	2.45	20	17.80
Grdanoska Tatjana	8	20	10	28	2	6	3	9	2.24	21	16.80
Mirchevska Gordana	0	28	0	38	0	8	0	12	0.00	26	22.40
Kjurchikj-Trajkovska Biljana	1	27	0	38	0	8	0	12	0.00	26	22.20
Jurhar-Pavlova Maja	3	27	0	38	0	8	0	12	0.00	26	22.20
Labachevska Liljana	0	28	0	38	0	8	0	12	0.00	26	22.40

Petlichkovski, Mirko Spiroski, and Dejan Trajkov). Olivija Efinska-Mladenovska took the 19th place with 18 published papers, 38 citations and mean rank of 9.20. The remaining two members of the academic staff of this Institute (Olgica Sibinovska and Slavica Hristomanova) published 5 and 3 papers with 6 and 3 citations, respectively. They are on the 19th and 21st place on the scientific scale (Table 5).

Gordana Petrushevska from the Institute of Pathology is first on the Top Ten Scientists list. The second group of academic staff members from the Institute of Pathology (Vanja Filipovski, Biljana Bogoeva, Vesna Janevska, and Slavica Kostadinova-Kunovska) are placed below the 20th place on the scientific scale. The remaining academic staff members from the Institute of Pathology is on the 21st and 22nd place (Table 6).

Four members of the academic staff employed at the Institute of Microbiology and Parasitology (Tatjana Grdanovska, Nikola Panovski, Milena Petrovska, and Ana Kaftandzhieva) are on the 17th to 18th place on the scientific scale. The remaining academic staff members of the Institute of Microbiology and Parasitology is around the 22nd place (Table 7).

Emilija Janevic-Ivanovska from the Institutte of Pathophysiology and Nuclear Medicine is on the Top Ten Scientists list with mean rank of 7.80. The second group of academic staff members from this Institute (Ana Ugrinska, Boris Andonovski, and Olivija Vaskova) is placed between the 15th and 17th place (14.80, 15.40, 17.20, and 17.40 respectively). The rest of academic staff members from this Institute is between the 20th and 22nd place on the scientific scale. Several members of the academic staff from this Institute have not published any paper (Ljiljana Muratovska, Biljana Crcareva, and Sinisha Stojanovski) (Table 8).

Table 8: Current scientific impact of the medical staff affiliated at the Institute of Pathophysiology and Nuclear Medicine (IPNM), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=19)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Miceva-Ristevska Svetlana	8	20	3	35	1	7	1	11	0.00	26	19.80
Vaskova Olivija	16	15	7	31	1	7	2	10	1.73	23	17.20
Loparska Suzana	12	16	7	31	1	7	2	10	1.73	23	17.40
Pop-Gjorcheva Daniela	6	22	1	37	1	7	1	11	0.00	26	20.60
Miladinova Daniela	2	26	5	33	1	7	2	10	2.00	22	19.60
Janevic-Ivanovska Emilija	11	17	59	7	3	5	7	5	6.48	5	7.80
Bogdanovska Angelina	5	23	2	36	1	7	1	11	1.00	25	20.40
Angjeleska Meri	1	27	1	37	1	7	1	11	0.00	26	21.60
Majstorov Venjamin	16	15	1	37	1	7	1	11	0.00	26	19.20
Ugrinska Ana	6	22	16	23	1	7	4	8	3.87	14	14.80
Muratovska Liljana	0	28	0	38	0	8	0	12	0.00	26	22.40
Andonovski Boris	10	18	14	25	2	6	3	9	2.65	19	15.40
Kuzmanovska Sonja	7	21	1	37	1	7	1	11	0.00	26	20.40
Tripunovski Toni	2	26	0	38	0	8	0	12	0.00	26	22.00
Zdravkovska Maja	6	22	0	38	0	8	0	12	0.00	26	21.20
Crcareva Biljana	0	28	0	38	0	8	0	12	0.00	26	22.40
Stojanovski Sinisha	0	28	0	38	0	8	0	12	0.00	26	22.40
Ristevska Nevenka	2	26	0	38	0	8	0	12	0.00	26	22.00
Zdraveska-Kochovska Marina	1	27	0	38	0	8	0	12	0.00	26	22.20

Table 9: Current scientific impact of the medical staff affiliated at the Institute of Preclinical and Clinical Pharmacology with Toxicology (IPCPT), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=15)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Petrov Stojmir	10	18	8	30	1	7	2	10	2.00	22	17.40
Miloshevski Petar	5	23	23	19	1	7	4	8	4.58	10	13.40
Labachevski Nikola	2	26	0	38	0	8	0	12	0.00	26	22.00
Slaninka-Miceska Maja	3	25	7	31	1	7	2	10	2.00	22	19.00
Trojachanec Jasminka	2	26	5	33	1	7	2	10	2.00	22	19.60
Zafirov Dimche	4	24	6	32	1	7	2	10	2.00	22	19.00
Balkanov Trajan	2	26	0	38	0	8	0	12	0.00	26	22.00
Kostova-Petrova Elena	7	21	15	24	3	5	3	9	2.24	21	16.00
Jakjovski Krume	4	24	6	32	1	7	2	10	2.00	22	19.00
Zendelovska Dragica	42	4	213	2	8	1	13	2	9.33	4	2.60
Simeska Suzana	6	22	16	23	2	6	4	8	3.32	16	15.00
Kikerkov Igor	4	24	5	33	1	7	2	10	2.00	22	19.20
Atanasovska (Jovanoska) Emilija	3	25	0	38	0	8	0	12	0.00	26	21.80
Miloshevska-Gjorgjeva Kalina	1	27	5	33	1	7	1	11	2.00	22	20.00
Petrovski Ognen	1	27	0	38	0	8	0	12	0.00	26	22.20

One member of the academic staff from the Institute of Preclinical and Clinical Pharmacology with Toxicology (Dragica Zendelovska) is on the Top Ten Scientists list, with mean rank of 2.60. The second group of academic staff members from this Institute (Suzana Simeska, Petar Miloshevski, Elena Petrova, and Stojmir Petrov) is positioned between the 15th and 17th place with mean rank of 15.00, 13.40, 16.00 and 17.40 respectively. The remaining members of the academic staff from this Institute are ranked between the 19th and 22nd position on the scientific scale. All members of the academic staff from this Institute (even the youngest ones) have published at least one scientific paper (Table 9).

Rosalinda Isjanovska from the Institute of Epidemiology, Statistics and Medical Informatics is on the 16th place of scientific scale with 9 published papers and 12 citations. The rest of the academic staff from this Institute are on the 18th to 22nd place on the scientific scale (Table 10).

The first place from the Institute of Forensic Medicine and Criminalistics belongs to Aleksej Duma with 8 published papers, 19 citations and mean rank of 13.80. The other members are distributed between the 17th and 22nd place on the scientific scale (Table 11).

Doncho Donev from the Institute of Social Medicine is on the Top Ten Scientists with mean rank of 7.80. The second place belongs to Mome Spasovski with 8 papers, 9 citations and mean rank of 17.20. The third member of this (smallest) Institute belongs to Vladimir Lazarevikj with 5 papers, 2 citations and mean rank of 20.60 (Table 12).

Current Top Ten Scientists from the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Republic of Macedonia are shown in Table 13.

Gordana Petrushevska from the Institute of Pathology is on the first place of Top Ten Scientists list with 62 publications, 244 citations and mean rank of 1.40. Aleksandar Petlichkovski from the Institute of Immunobiology and Human Genetics is on the second place with 48 papers, 199 citations and 2.40 mean rank. Dragica Zendelovska from the Institute of Preclinical and Clinical Pharmacology with Toxicology is on third place with 42 papers, 213 citations and 2.60 mean rank. Ljudmila Efremovska from the

Table 10: Current scientific impact of the medical staff affiliated at the Institute of Epidemiology, Statistics and Medical Informatics (IESMI), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=9)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Danilovski Dragan	4	24	2	36	1	7	1	11	1.00	25	20.60
Vasilevska Kristin	10	18	7	31	2	6	2	10	1.41	24	17.80
Mirovska-Taushanova Biljana	3	25	1	37	1	7	1	11	0.00	26	21.20
Orovchanec Nikola	14	16	3	35	1	7	1	11	1.00	25	18.80
Zdravkovska Milka	6	22	0	38	0	8	0	12	0.00	26	21.20
Velikj-Stefanovska Vesna	0	28	0	38	0	8	0	12	0.00	26	22.40
Isjanovska Rozalinda	9	19	12	26	1	7	3	9	2.65	19	16.00
Zafirova-Ivanovska Beti	5	23	0	38	0	8	0	12	0.00	26	21.40
Pavlovska Irina	6	22	0	38	0	8	0	12	0.00	26	21.20

Table 11: Current scientific impact of the medical staff affiliated at the Institute of Forensic Medicine and Criminalistics (IFMC), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=13)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Duma Aleksej	8	20	19	21	2	6	4	8	3.87	14	13.80
Chakar Zdravko	3	25	0	38	0	8	0	12	0.00	26	21.80
Janeska Biljana	4	24	5	33	1	7	2	10	2.00	22	19.20
Gutevska Aleksandra	4	24	0	38	0	8	0	12	0.00	26	21.60
Poposka Verica	2	26	0	38	0	8	0	12	0.00	26	22.00
Jakjovski Zlatko	2	26	5	33	1	7	2	10	2.00	22	19.60
Davcheva Natasha	2	26	0	38	0	8	0	12	0.00	26	22.00
Jankova Renata	2	26	11	27	1	7	2	10	3.16	17	17.40
Stankov Aleksandar	0	28	0	38	0	8	0	12	0.00	26	22.40
Petrovska Suzana	0	28	0	38	0	8	0	12	0.00	26	22.40
Ani-Grueva Dika	0	28	0	38	0	8	0	12	0.00	26	22.40
Chakar Ljupcho	0	28	0	38	0	8	0	12	0.00	26	22.40
Trifunova Ana	0	28	0	38	0	8	0	12	0.00	26	22.40

Institute of Medical and Applied Physiology is on the fourth place with 33 papers, 150 citations and 3.60 mean rank. Fifth place on the Top Ten Scientists list belongs to Mirko Spiroski from the Institute of Immunobiology and Human Genetics with 85 papers, 106 citations and 4.00 mean rank. The sixth place belongs to Ljiljana Bozhinovska from the Institute of Medical and Applied Physiology with 35 published papers, 75 citations and 5.00 mean rank. The seventh place belongs to Sloboda Dzhekova-Stojkova from the Institute of Medical, Experimental and Applied Biochemistry with 29 papers, 43 citations and 7.40 mean rank. The eight place belongs to Dejan Trajkov from the Institute of Immunobiology and Human Genetics with 29 papers, 49 citations and 7.60 mean rank. The ninth and tenth places share Emilija Janevic-Ivanovska from the Institute of Pathophysiology and Nuclear Medicine with 11 papers, 59 citations and Doncho Donev from the Institute of Social Sciences with 30 papers, 43 citations and 7.80 mean rank (Table 13).

Table 12: Current scientific impact of the medical staff affiliated at the Institute of Social Medicine (ISM), Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia (October, 2009).

Surname and Name (n=3)	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Donev Doncho	30	7	43	10	4	4	6	6	4.24	12	7.80
Spasovski Mome	8	20	9	29	2	6	3	9	2.00	22	17.20
Lazarevikj Vladimir	5	23	2	36	1	7	1	11	0.00	26	20.60

Discussion

Mean rank of the scientific position of each member of the academic staff employed at the Institutes, Faculty of Medicine was calculated based on five parameters (papers, citations, h-index, g-index, and e-index). This kind of combination of

Table 13: Current top ten scientists at the Institutes, Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia.

Surname and Name	Affiliation	Papers	Rank papers	Citations	Rank Citations	H-index	Rank h-index	G-index	Rank g-index	E-index	Rank e-index	Scientific position - Mean rank
Petrushevska Gordana	IP	62	2	244	1	6	2	15	1	12.85	1	1.40
Petlichkovski Aleksandar	IIBHG	48	3	199	3	6	2	13	2	11.66	2	2.40
Zendelovska Dragica	IPCPT	42	4	213	2	8	1	13	2	9.33	4	2.60
Efremovska Ljudmila	IMAP	33	6	150	4	6	2	12	3	9.59	3	3.60
Spiroski Mirko	IIBHG	85	1	106	5	5	3	8	4	5.58	7	4.00
Bozhinovska Liljana	IMAP	35	5	75	6	4	4	8	4	6.24	6	5.00
Dzhekova-Stojkova Sloboda	IMEAB	29	8	43	10	3	5	6	6	5.10	8	7.40
Trajkov Dejan	IIBHG	29	8	49	9	4	4	6	6	4.36	11	7.60
Janevic-Ivanovska Emilija	IPNM	11	17	59	7	3	5	7	5	6.48	5	7.80
Donev Doncho	ISM	30	7	43	10	4	4	6	6	4.24	12	7.80

IP, Institute of Pathology; IIBHG, Institute of Immunobiology and Human Genetics; IPCPT, Institute of Preclinical and Clinical Pharmacology with Toxicology; IMAP, Institute of Medical and Applied Physiology; IMEAB, Institute of Medical, Experimental and Applied Biochemistry; IPNM, Institute of Pathophysiology and Nuclear Medicine; ISM, Institute of Social Medicine.

bibliometric parameters is expected to be objective for individual measurement of the scientific impact.

A very big variation in the scientific impact between academic staff members from different Institutes, as well as individual differences inside the discipline (institute) was found. Top Ten Scientists list was created on the base of the mean rank of each member of the academic staff. On the Top Ten Scientists list from the institutes there are three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member from each of the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and from the Institute of Social Sciences. It should be emphasised that the big differences observed between individuals cannot be interpreted as differences in quality between them without a further more specific investigation, which should focus on differences between (sub)fields and other papers published in Macedonian language in local journals.

It is well known that publications in certain disciplines are typically cited much more or much less than in others. This may be a results of several reasons, including the uneven number of cited papers per article in different fields or unbalanced cross-discipline citations (6). A typical example may be provided in the field of mathematics: the highest 2006 impact factor (IF) for journals in this category (Journal of the American Mathematical Society) is 2.55, whereas this figure is 10 times higher or more in other disciplines (for example, in 2006, New England Journal of Medicine had IF 51.30, Cell had IF 29.19, and Nature and Science had IF 26.68 and 30.03, respectively) (7). Differences found between disciplines (Institutes) at the Faculty of Medicine in Skopje, could be partly a result of different citations in those disciplines (8).

Because of the loss of citation information, comparisons based on the h-index alone can be misleading, whose total citations are much more than those of many researchers having higher h-indices; the ignored excess citations (e2) are more than 5 times of h2 citations. Therefore, for accurate and fair comparisons, it is necessary to use the e-index together with the h-index (9). Hirsch-index together with a couple of other bibliometric parameters for the assessment of the scientific output (h-index all papers, h-index 1st author paper, papers, citations, citations/paper, and m) of 29 Dutch professors in clinical cardiology was explored. The results have shown that even within such a homogeneous group there is a large interindividual variability (10). If the h index is used for the evaluation of research performance, it should always be taken into account that, it is dependent on the length of an academic career and the field of study in which the papers are published and cited. For this reason, the index should only be used to compare researchers of a similar age and within the same field of study (11).

The brilliance of the h-index is that it provides a single, easy to compute, quantitative measure of one's cumulative impact. But, if one wants his/her impact to go up, he/she have to remember that all decisions in his/her career should be considered in terms of their potential to boost your h-index. Some experienced editors have made several suggestions: 1) switch fields; 2) write more reviews; 3) implement the Discreet System of Self Citation (DSSC); 4) h-index Projections; and 5) impact Caching (12).

In general, an h-index number increase with the length of time over which it is measured; hence, older scientists would usually be expected to sport h-index numbers higher than their younger counterparts (13). Probably this is one of the explanations for the individual differences in the scientific impact inside the disciplines found in this study.

In conclusion, I can say that current individual scientific impact of the academic staff employed at the Institutes of the Faculty of Medicine, University "Ss Kiril and Metodij", Skopje, Republic of Macedonia is very heterogeneous. On the Top Ten Scientists list there are three members from the Institute of Immunobiology and Human Genetics, two members from the Institute of Medical, Experimental and Applied Physiology with Anthropology, and one member each from the Institute of Pathology, Institute of Preclinical and Clinical Pharmacology with Toxicology, Institute of Medical, Experimental and Applied Biochemistry, Institute of Pathophysiology and Nuclear Medicine, and from the Institute of Social Sciences.

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