

# A SCIENTOMETRIC MAPPING OF RESEARCH PRODUCTIVITY: A CASE STUDY

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## **Abstract**

The paper presents a Scientometrics analysis of publications of Institute of Occupational Medicine And Environmental Health, Poland, during 2010 to 2016 as reflected in Web of Science database. It attempts to analyze the growth and development of research activity of Institute of Occupational Medicine And Environmental Health as reflected in publications output. Data for a total of 118 have been downloaded and analysed according to objectives. The study reveals that the research productivity of year wise growth of literature in terms of total papers, Article are the most published form of literature 95 (80.51%) The Most Productive author based on their publication profile it is reveal Pawlas, Natalia published highest numbers of papers, i.e. 24, Public Environmental Occupational Health is the top favoured area of research among the contributors with no. of papers 28.81%, followed by Environmental Sciences Ecology with 22.88%. USA in the top with no. of publications is 12 (10.17%) In terms of the top collaborative institutions(National/International level).Medical University Silesia in an top position with 45 (38.14) Publications, followed by Wroclaw Medical University; University of Silesia & Central Institute for Labour Protection National Research Institute with 8 Publications (6.78%), University of London with no. of publications 7 (5.93%).

**Keywords:** Research Output; Research Productivity.

## **1.0 Introduction**

“Institute of Occupational Medicine and Environmental Health, is located at 13, Kościelna, street 41-200 Sosnowiec, Poland” The Institute was formed in 1950 as a Central Silesian Institute of Occupational Medicine in Zabrze-Rokitnica acting within the structures of Silesian Medical Academy”. “Two years later it was renamed as the State Institute of Occupational Medicine of Silesian Medical Academy. Cabinet’s resolution in 1954 separated the Institute from the Silesian Medical Academy and began self-supporting activity as the Institute of Occupational Medicine acting in the steel and coal mining industry”. “The location of the Institute is in the highly urbanized and industrialized region of Upper Silesia in Poland with the dominating steel and coal mining industry requesting to extend the Institute’s profile to : health protection of employees working in heavy industry and treatment of diseases due to exposure to hazardous factors in workplaces.”

“In 1965 the Cabinet decided that the seat of the Institute would be in Sosnowiec town. Full integration took place in the years 1970-1972”. “In the turn of 1991-1992 the Institute operated shortly within the Institute of Occupational Medicine in Łódź. Since the the year 1992 the Institute became a self-standing establishment again”. IOMEH’s staff consists of high class specialists from different branches of medical and natural science having recorded wide scientific achievements. Within the structure of IOMEH there is a Ward for Occupational Internal Diseases and Allergology and a Regional Centre for Acute Intoxication including numerous departments and laboratories and other organizational units; substantive and administrative. In the framework of the Institute there is a unique outpatient clinic of Environmental Medicine and a Training Centre of Environmental Health. The Institute holds the seat of the Main Board of Polish Society of Environmental Medicine – Silesian Branch of Polish Society of Occupational Medicine and Association of Labour Hygienists”.

The Institute offers a wide spectrum of services such as: experts’ opinions, measurements, consultations, assessments of hazardous factors impact on human in workplace, etc. (2017)<sup>1</sup>”

## **2.0 Review of Literature**

Few quantitative studies have been carried to analyzing institutions research outputs by using scientometrics analysis. The following study has been reviewed in view of better understanding of research productivity using scientometrics analysis:-

Subhodip Bid<sup>4</sup> (2016) “analysis of publications of Indian Institute of Technology Kharagpur for the period 2000 to 2015 emphasize the growth and development of research activity of this institution”.

Vivek Kumar Singh<sup>5</sup> (2015) “analyze the Research output of Indian Institute of Technology Mandi (IIT Mandi) and focusing on the collaboration at different levels such as author, institution and status of collaboration at National/international level”.

Sumit Kumar Banshal<sup>2</sup> (at...al.) (2017) “analyzed the research performance of 16 older Indian Institutes of Technology of India, shows that there is a substantial difference in research performance levels of old IITs vis-à-vis the new IITs”.

Nabi Hasan<sup>3</sup> (2015) “The paper attempts to evaluate the trend of research output of five top ranked Indian Institutes of Technology (IITs) on the basis of research papers/articles indexed in Web of Science online database for the five years’ period of 2009-13. A total of 215,019 records were retrieved for India which are 2.72% of the global records for the period 2009-13”.

Tasleem Arif<sup>6</sup>, (2015) “analyzed the Research Productivity of Indian Institutes of Technology, faculty member of computer science Engineering departments of four IITs Study find that there are much differences in research productivity in terms number of publications, growth of literature, per capita productivity, etc. IIT Madras has outperformed in amongst of them”.

### **3.0 Objectives of The Study**

1. To analyze year wise research output in terms of Total paper.
2. To find out the top most productive authors.
3. To know Research area -wise Distribution of Publications
4. To find out the top collaborative institutions national and international levels.
5. To identify the collaboration with other countries
6. To determine the types of documents preferred, in which maximum research findings have been published.

### **4.0 Data Collection**

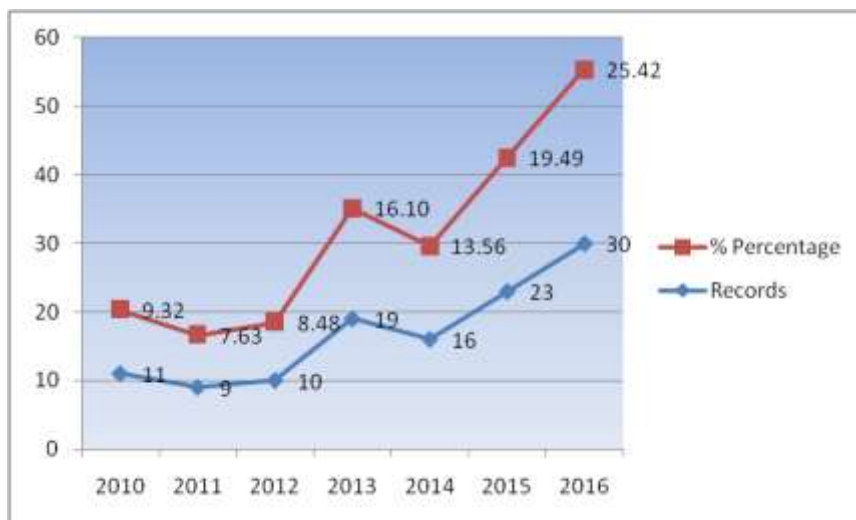
“The data included for this study are derived from Clarivate Analytics Web of Science. © Copyright Clarivate Analytics” (2017)<sup>7</sup> a bibliographic and citation database was used which covers a selected group of journals and conferences. The data was collected for the period 2010-2016. The 7 years period is a good period to know research productivity. The search has been made in web of science core collection for retrieving data was Organization-Enhanced: Institute of Occupational Medicine & Environmental Health, Timespan=2010 2016, in 10 Oct. 2017.. The full record downloaded in the excel format i.e. article, proceedings paper, editorial material, titles, author records, affiliation and citation references etc.

### **5.0 Methodology**

For Scientometric analysis of publication data Institute of Occupational Medicine and Environmental Health Poland, the standard form of methodologies were used to analysis of various parameters like year wise growth rate of papers, Highly Prolific Authors, Internationally Collaborated Papers (ICP), , the top productive authors were identified and their performances were analysis based on their publications productivity. The most collaborating institutions and countries have been recognized using extraction of information from affiliation text. Finally the major research areas were examined and mapping them in major areas of research.

### **6.0 Data Analysis and Interpretation**

**6.1 Growth of Literature:**



**Figure 1:** Year-wise research growth in terms of Total papers

The year wise research growth in terms of TP (Total papers) are given in figure 1, it is shows that no. of research paper are increasing year wise from 2010 to 2016 Except a little slow down in the year 2011 & 2012. It reveal that highest no. papers published in 2016, No. of Papers: 30 (25.42%) and lowest in 2012 total No. of papers: 9 (7.63%).

**6.2 Most Productive/Highly Prolific Authors and their Publications**

**Table 1:** Highly Prolific Authors and their Publications

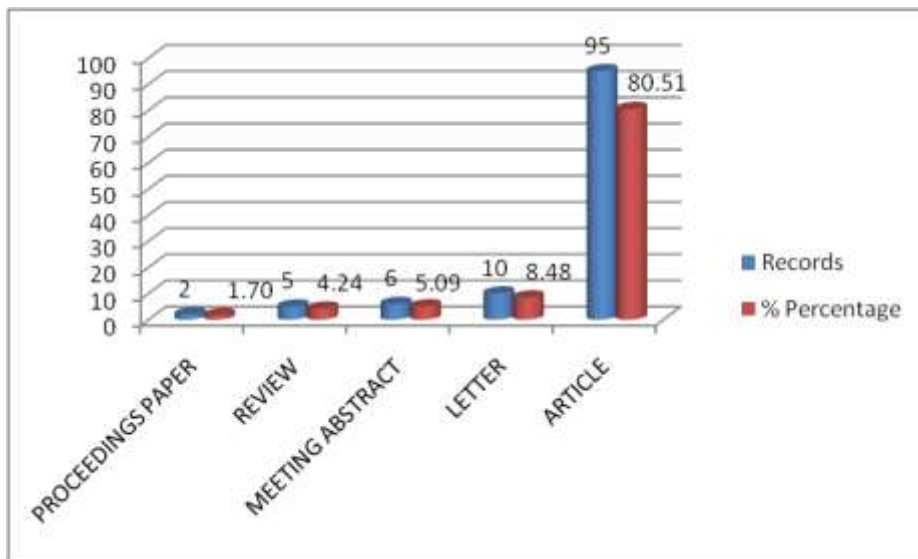
S.N.	Authors	Records	% Percentage
1	Pawlas, Natalia	24	20.34
2	Prokopowicz, Adam	18	15.25
3	Sobczak, Andrzej	18	15.25
4	Brodziak, Andrzej	13	11.02
5	Pawlas, Krystyna	11	9.32
6	Marczak, Wojciech	9	7.63
7	Brewczynski, PZ	8	6.78
8	Niesler, A	8	6.78

Table 1 shows a list of most productive/ prolific authors, it has been reveal that Pawlas, Natalia, published highest numbers of papers, i.e. 24 followed by Prokopowicz Adam & Sobczak Andrzej published 18 papers with second position, Brodziak, Andrzej published 13 papers with third position and others are given in table.

**6.3 Distribution of publications according to type:**

**Table :2** Distribution of Publications According to Type

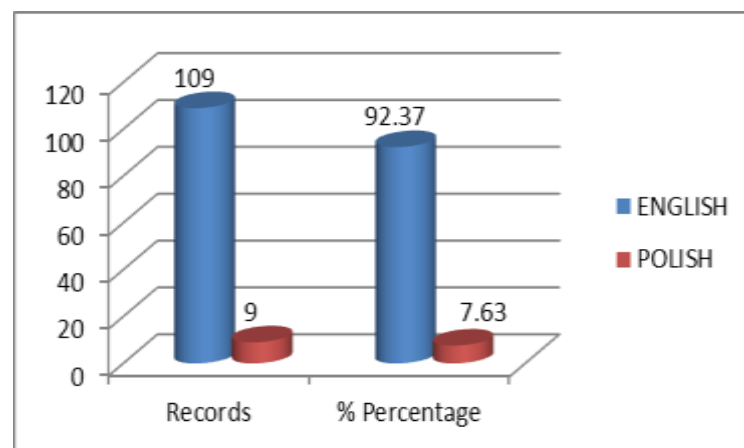
Document Types	Records	% Percentage
ARTICLE	95	80.51
LETTER	10	8.48
MEETING ABSTRACT	6	5.09
REVIEW	5	4.24
PROCEEDINGS PAPER	2	1.70



**Figure 2: Distribution of publications according to type**

Table: 2 & Figure -2 shows that Distribution of publications according to type it is shows that research productivity in form of no. of article was 95 (80.51%) followed by Letter 10 (8.48%) and other are given in table and figure. it is reveal that research productivity in term of article is found highest.

**6.4 Language Wise Distribution of Publications:**



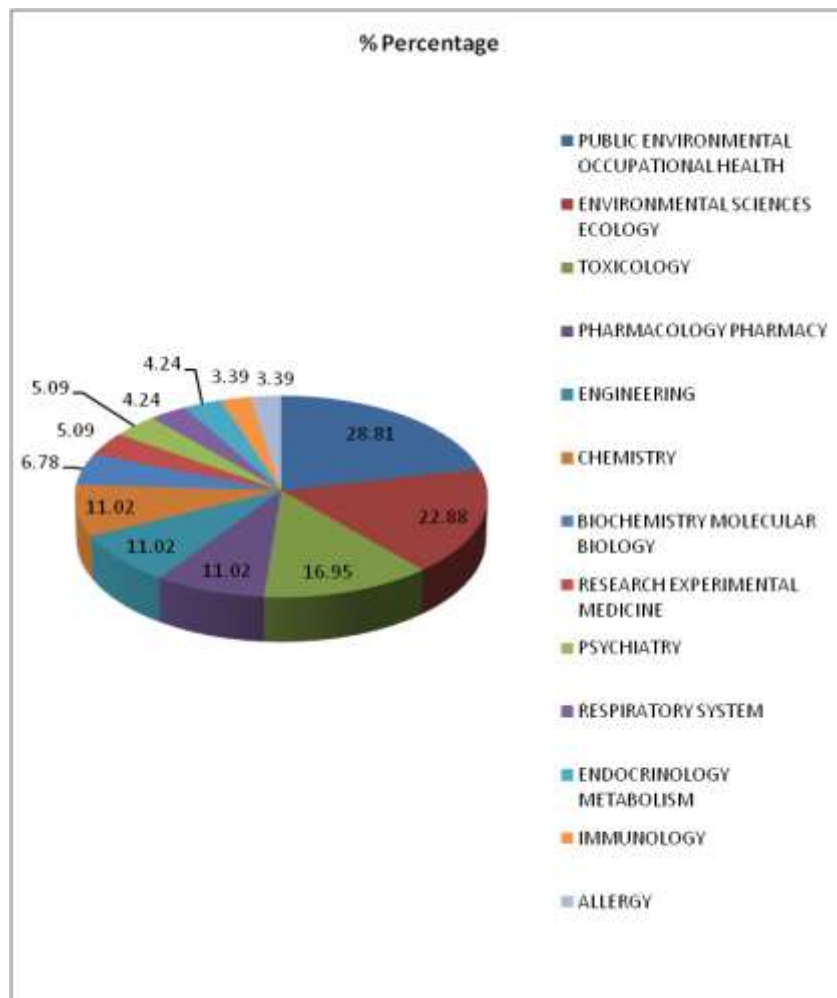
**Figure 3: Language wise distribution of papers**

It is reveal from the figure 3 that literature in English in top position i.e. No. of Publications in English language was 109 and papers in language of Polish was No of publications 9 only.

**6.5 Research Area -wise Distribution of Publications**

**Table 3 : Research area -wise Distribution of Publications**

Research Areas	% Percentage	Records
Public Environmental Occupational Health	28.81	34
Environmental Sciences Ecology	22.88	27
Toxicology	16.95	20
Pharmacology Pharmacy	11.02	13
Engineering	11.02	13
Chemistry	11.02	13
Biochemistry Molecular Biology	6.78	8
Research Experimental Medicine	5.09	6
Psychiatry	5.09	6
Respiratory System	4.24	5
Endocrinology Metabolism	4.24	5
Immunology	3.39	4
Allergy	3.39	4



**Figure 4: Research area -wise Distribution of Publications**

Table-3 & Figure-4 shows that the research output covered in this study during 2010-2016 as various subjects as defined by WoS. The list of Top subjects for which the authors mostly contributed papers. it is found that Public Environmental Occupational Health is the top favoured area of research among the contributors with 28.81%, followed by Environmental Sciences Ecology with 22.88%, Toxicology with 16.95%, Pharmacology Pharmacy 11.02%, Engineering with 11.02 % and others are given in table.

## 6.6 Collaboration with Other Countries

**Table-4 Collaboration of papers with other countries**

S.No.	Countries/Territories	Records	% Percentage
1	USA	12	10.17
2	England	9	7.63
3	Italy	8	6.78
4	Sweden	7	5.93
5	Hungary	7	5.93
6	Slovakia	6	5.09
7	Netherlands	6	5.09
8	Czech Republic	6	5.09
9	Russia	5	4.24
10	Germany	4	3.39
11	Austria	3	2.54
12	Switzerland	2	1.70
13	Slovenia	2	1.70
14	Peoples R China	2	1.70
15	Morocco	2	1.70
16	France	2	1.70
17	Ecuador	2	1.70
18	Croatia	2	1.70
19	Bulgaria	2	1.70
20	Belgium	2	1.70

Table-4 shows that collaboration of papers with author other countries, It is reveal that USA in the top with no. of publications is 12 (10.17%), followed by England 9 (7.63) as a second position and Italy with no. of publication is 8 (6.78%) in third position.

**6.7 Top Collaborative Institutions National/International Level****Table- 5: Top collaborative Institutions (National/International level)**

S.No.	Top collaboration Institutions (National/International level)	Records Count	% Percentage
1	Institute Of Occupational Medicine Environmental Health	118	100.00
2	Medical University Silesia	45	38.14
3	Wroclaw Medical University	8	6.78
4	University of Silesia	8	6.78
5	Central Institute for Labour Protection National Research Institute	8	6.78
6	University of London	7	5.93
7	Roswell PkCancInst	6	5.09
8	Pomeranian Medical University	6	5.09
9	UnivApplSci	5	4.24
10	Reg Author PublHlth	5	4.24
11	Polish Academy of Sciences	5	4.24
12	Harvard University	5	4.24

Table -5 shows the top collaborative institutions (National/International level). It is reveal that authors/contributors of Institute of Occupational Medicine And Environmental Health were collaborating with many institutions to publish their papers, It has been found that in top collaborative institutions was Medical University Silesia with 45 (38.14) Publications, followed by Wroclaw Medical University; University of Silesia & Central Institute for Labour Protection National Research Institute with 8 Publications (6.78%) , University of London with no. of publications 7 (5.93).

**7.0 Findings & Conclusion**

The study reveal that Institute of Occupational Medicine And Environmental Health which has contributed 118 papers from 2010 to 2016. The year wise The Most Productive author based on their publication profile it is reveal Pawlas, Natalia published highest numbers of papers, i.e. 24 followed by Prokopowicz Adam & Sobczak Andrzej published 18 papers with second position, Brodziak, Andrzej published 13 papers with third position, Contributors have a tendency to publish their papers in Articles as no. of article was 95 (80.51%) followed by Letter 10 (8.48%). Public Environmental Occupational Health is the top favoured area of research among the contributors with 28.81%, followed by Environmental Sciences Ecology with 22.88%. USA in the top with no. of publications is 12 (10.17%), followed by England 9 (7.63) as a second position and Italy with no. of publication is 8 (6.78%) in third position. In terms of the top collaborative institutions(National/International level)., Medical University Silesia with 45 (38.14) Publications, followed by Wroclaw Medical University; University of Silesia & Central Institute for Labour Protection National Research Institute with 8 Publications (6.78%) & University of London with no. of publications 7 (5.93).

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