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Original article

Brazilian CNPq research productivity fellows in the field of pneumology

Bolsistas brasileiros de produtividade em pesquisa do CNPq na área de pneumologia

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Abstract

Objective: to describe the profile and scientific production of brazilian CNPq Research Productivity fellows in the field of Pulmonology. **Materials and Methods**: the study employed a cross-sectional census of 28 CNPq medical fellows, specialized in pulmonology. The curriculum vitae of each selected researcher was reviewed through the CNPq Lattes platform. Data extracted from the curriculum were analyzed using SPSS® 26.0, focusing on researcher demographics, publication metrics (published scientific articles, citations and H-index), and human resource training (scientific initiation, master's and PhD supervision). **Results:** there was a predominance of males (64.3%), concentrated in São Paulo (42.8%), Rio Grande do Sul (21.4%), and Rio de Janeiro (17.8%). Collectively, they published 4,795 papers, averaging 171.25 articles per researcher, mainly indexed in Web of Science (80.77%) and Scopus (52.16%). In human resource training, they advised 445 scientific initiations, 472 Master's students, and 346 PhD students. The median H-index at in this group of 28 researchers was 27. **Conclusion:** the researchers exhibit notable scientific productivity, highlighted by a significant H-index and active involvement in supervising scientific initiation, master's, and PhD students.
Keywords: Bibliometrics. Scientific Publication Indicators. Physicians. Pulmonology. Education.

Resumo

Objetivo: descrever o perfil e a produção científica dos bolsistas de Produtividade em Pesquisa do CNPq no campo da Pneumologia. **Materiais e Métodos:** o estudo utilizou um censo transversal de 28 bolsistas médicos do CNPq, especializados em Pneumologia. O currículo de cada pesquisador selecionado foi consultado na plataforma Lattes do CNPq. Os dados extraídos do currículo foram analisados usando o SPSS® 26.0, com foco em características demográficas dos pesquisadores, métricas de publicação (artigos científicos publicados, citações e índice H) e treinamento de recursos humanos (iniciação científica, orientação de mestrado e doutorado). **Resultados:** houve predomínio do sexo masculino (64,3%), concentrados em São Paulo (42,8%), Rio Grande do Sul (21,4%) e Rio de Janeiro (17,8%). Coletivamente, eles publicaram 4.795 artigos, com uma média de 171,25 artigos por pesquisador, principalmente indexados na Web of Science (80,77%) e Scopus (52,16%). No treinamento de recursos humanos, eles orientaram 445 iniciações científicas, 472 alunos de mestrado e 346 alunos de doutorado. O índice H mediano neste grupo de 28 pesquisadores foi de 27. **Conclusão:** apesar da distribuição de gênero, os pesquisadores exibem uma produtividade científica notável, destacada por um índice H significativo e envolvimento ativo na supervisão de iniciações científicas, mestrado e doutorado.
Palavras-chave: Bibliometria. Indicadores de Publicação Científica. Médicos. Pneumologia. Educação.

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Introduction

Science can be understood as a dynamic, self-organizing, and continuously developing network that operates across multiple scales[1]. Breakthroughs in research, technological innovations, and the extensive use of cutting-edge knowledge serve as crucial drivers of success in today's highly competitive global economy. Consequently, the robustness of a nation's research and development efforts can act as a significant measure of both its present and future economic competitiveness[2].

The COVID-19 pandemic highlighted the crucial role of science for brazilian citizens, especially in addressing the immense challenges brought by the crisis. The response, both nationally and globally, was swift and substantial, driving unprecedented levels of scientific research[3]. In fact, within the first year alone, from January 24th to December 13rd, 2020, a total of 60,830 COVID-19-related articles were published and indexed in the Web of Science database. Notably, four countries—the United States, China, Italy, and England—produced around 60% of these publications, while twelve countries together accounted for approximately 95% of the global scientific output on COVID-19, including the United States, China, Italy, England, India, Canada, Germany, Spain, Australia, Brazil, Iran, and Turkey[3].

In the last 20 years, brazilian scientific output experienced significant expansion and gained greater international recognition. This development impacted the nation's standing in the global ranking of publications in journals indexed in the Scopus database[2]. However, for scientific growth to be consolidated, financial investments in research should be treated as federal policies rather than state-level initiatives. Research funding in Brazil remains unstable[4], brazilian science has systematically suffered budget cuts since 2014. Research funding and the budget of leading science and technology funding agencies were reduced by around 60% from 2014 to 2022. Such cuts mean that Brazil reduced its capacity for innovation and economic diversification that are necessary for improving socioeconomic conditions[5,6].

The Brazilian National Council for Scientific and Technological Development (CNPq) is devoted primarily to research funding. It also offers a particular form of research grant called scientific productivity fellowship. At present, these researchers are grouped into three categories (1, 2, and senior)[7-13]. Category 1 is further divided into four sublevels: 1A, 1B, 1C, and 1D. Established in the 1970s, this scholarship program was designed to support researchers who have made significant scientific contributions within their respective fields[7-9]. Previous studies highlighted the importance of PQ performance and its contributions in areas such as Medicine and Dentistry[7-9], as well as their subfields. Therefore, this study is justified by the lack of recent research on scientific production in

pulmonology. The objective of the present study is to describe the profile and scientific production of PQ in Pulmonology.

Materials and Methods

A cross-sectional and census-based study was conducted. We initially established a database of 548 medical PQs based on a list provided by the research funding itself in December 2022 (http://memoria2.cnpq.br/bolsistas-vigentes). 28 of the 548 researchers had Pulmonology as an area of investigation. The analysis of the researchers' profile followed the category division established by CNPq, as previously explained. There is not senior researcher in studied group. The inclusion criterion was the presence of the researcher in the list provided by CNPq referring to medical fellows in the field of pulmonology in December 2022. Researchers who were not included in this list were excluded from the analysis (http://www.cnpq.br/web/guest/bolsistasvigentes).

The curriculum vitae of each selected researcher was reviewed though the CNPq Lattes platform (http://buscatextual.cnpq.br/buscatextual/busca.do?metodo=apresentar) and used to extract the information needed for the study. The data obtained were used for construction of a database, which was constructed and analyzed using the *Statistical Package for the Social Sciences*® 26.0 statistical program. The data obtained were grouped into three sets of variables for analysis: characteristics of the researcher (comprising geographical, institutional distribution and H-index), scientific publications and human resource training.

Information on scientific publications involved the number of scientific articles published throughout the PQ career (period defined between the first scientific publication until December 2022), scientific articles published during the period 2018-2022 and total citations in the SciELO (https://scielo.org/), Scopus (https://www.scopus.com/) and Web of Science (https://www.webofscience.com), databases. In the dimension, human resource training, the information obtained was about scientific initiation, master's and PhD in the career and in the last five years (2018-2022). The study used public and secondary data, not requiring submission to the Research Ethics Committee.

Results

Among the 28 pulmonology PQs, that represent 5,1% of all the PQs in medicine, the majority was male (n=18; 64.3%) and held grants in category 2 (n=17; 60.7%). There was a concentration in the states of São Paulo (n=12; 42.8%), Rio Grande do Sul (n=6; 21.4%) and Rio de Janeiro (n=5; 17.8%). All researchers were identified only in three brazilian regions: Southeast (n=20; 71.4%),

South (n=7; 25%) and Northeast (n=1; 3.4%). Although Pulmonology researchers were affiliated with 16 different institutions, 60.7% worked in only five of them, namely University of São Paulo (n=8; 29%), Federal University of Rio Grande do Sul (n=3; 11%), Federal University of Rio de Janeiro (n=2; 7%), Federal University of Juiz de Fora (n=2; 7%) and São Paulo State University (n=2; 7%) (Table 1).

Table 1. Distribution of researchers in Pulmonology by institution. Brazil. (n=28).

Region	Institutional Affiliation	Category					n	%
		2	1D	1C	1B	1A		
Southeast	University of São Paulo	4	1	0	2	1	8	28,6
	São Paulo State University	2	0	0	0	0	2	7,1
	São José do Rio Preto Medical School	1	0	0	0	0	1	3,6
	Santo Amaro University	0	1	0	0	0	1	3,6
	Federal University of Rio de Janeiro	1	0	0	0	1	2	7,1
	Petrópolis Medical School	1	0	0	0	0	1	3,6
	Gama Filho University	0	0	0	1	0	1	3,6
	South Fluminense University	1	0	0	0	0	1	3,6
	Federal University of Juiz de Fora	2	0	0	0	0	2	7,1
	Federal University of Minas Gerais	0	0	0	1	0	1	3,6
South	Federal University of Santa Catarina	1	0	0	0	0	1	3,6
	Federal University of Rio Grande do Sul	2	0	0	0	1	3	10,7
	Pontifical Catholic University of Rio Grande do Sul	0	0	1	0	0	1	3,6
	Federal University of Health Sciences of Porto Alegre	1	0	0	0	0	1	3,6
	Federal University of Santa Maria	0	1	0	0	0	1	3,6
Northeast	Federal University of Ceará	1	0	0	0	0	1	3,6
Total		17	3	1	4	3	28	100

Source: Prepared by the authors

The 28 Pulmonology researchers published 4,795 papers in scientific journals, with an average of 171.25 articles per PQ, throughout their careers, whereas 3,873 (80.77%) were indexed at Web of Science, (average of 138.32 articles/researcher), 2,501 (52.16%) were Scopus indexed (average of 89.32 articles/researcher), and 828 (17.27%) were SciELO (average of 29.57 articles/researcher).

The categories with the highest absolute number of papers published are 2 and 1B, with 2102 and 1074, respectively. The same can be observed for the scientific production of the last five years. Those with the lowest absolute number are categories 1C and 1D, 173 and 619, respectively. However, this scenario changes when analyzing the relative numbers of articles per researcher. Production was significant mainly in category 1A, which presented the highest average number of papers per researcher over the entire career (275.67 per researcher) and in the last 5 years (58.33 per researcher). The lowest average was at category 2 (123.65 per researcher). The same is also observed when evaluating the five-year period 2018-2022 (34.35 per researcher) (Table 2).

Table 2. Mean number of articles published by researcher at each level. Brazil (n=28).

Category[a]		2	1D	1B	1A
Articles published in the career	Mean (SD)[b]	123,65 (69,24)	206,33 (106,51)	268,5 (67,63)	275,67 (138,42)
Articles published in the last 5 years (2018 - 2022)		34,35 (18,93)	46,33 (26,57)	53,5 (20,48)	58,33 (19,85)

[a]*The 1C category has only one researcher, so it is not possible to calculate means for this category. The sole researcher in this category has produced 173 articles over their career and 40 during the period 2018-2022.*
[b]*Standard deviation.*
Source: Prepared by the authors

In the perspective of human resource training, over their careers, Pulmonology researchers advised 445 scientific initiations, (median of 15.89; range: 0–61), 472 Master's students (median of 16.85; range: 0–50) and 346 PhD students (median of 12.35; range: 1–35). There is an absolute prevalence of scientific initiation, Master's degree and PhD students at category 2 (259, 272 and 145, respectively). However, when corrected by the number of researchers in each category, the highest average of scientific initiation advisory was in 1D researchers (n=22.33; ranging 9 to 36 orientations), while for Master's degree (n=32; ranging 1 to 50 orientations) and PhD students (n=31; ranging 24 to 35 orientations) was in 1A researchers (Table 3). The median H-index at this group of 28 researchers was 27.

Table 3. Mean supervision per researcher according to each level. Brazil (n=28).

Category[a]			2	1D	1B	1A
Completed Supervision	Scientific Initiation	Mean (SD)[b]	15,24 (15,11)	22,33 (13,5)	12,75 (16,03)	19,67 (18,58)
	Master's degree		16,00 (13,96)	7,00 (6,24)	14,75 (20,53)	32,00 (26,96)
	PhD		8,53 (5,72)	7,67 (4,16)	19,25 (12,44)	31,00 (6,08)

[a]*The 1C category has only one researcher, so it is not possible to calculate mean values for this category. The sole researcher in this category has supervised 1 scientific initiation, 1 master's, and 1 doctoral student.*
[b]*Standard deviation.*

Discussion

This study aims to assess the contributions of brazilian CNPq researchers in the field of Pulmonology using various scientific indicators. As anticipated, the findings reveal that this group demonstrates high levels of scientific productivity and a strong participation in the academic community. In terms of quality, it is particularly significant that the majority of their publications appear in journals indexed in well-established databases, including SciELO, Web of Science, and Scopus.

Several criteria must be observed to become a CNPq Research Productivity fellows. As outlined by the CNPq Advisory Committee, the criteria for selecting and classifying researchers in the field of Medicine encompass multiple indicators. These include high-impact scientific publications, mentorship and training of students at undergraduate, master's, and PhD levels, contributions to technological innovation, the development of research projects supported by funding agencies, and active participation in editorial activities (https://www.gov.br/cnpq/pt-br/composicao/comites-de-assessoramento/criterios-de-julgamento). Numerous studies have assessed the profile and the scientific production of CNPq Research Productivity fellows in many areas of knowledge, such as Nephrology and Urology[10], Pediatrics[11], Hematology/Oncology[12], Tropical Medicine and infectious diseases[13] identifying factors consistent with our findings, including the regional and institutional concentration of researchers, as well as gender disparities.

The analysis indicated that male researchers were predominant in the study population (1.8:1). In this sense, Lariviere *et al.*[14] have presented a bibliometric analysis confirming that gender inequalities persist in research output worldwide. In Brazil, women show a lower proportion in the higher positions in the academic career, that is, those positions associated with higher income and higher academic prestige[15]. A recent study of medical researchers revealed a predominance of male researchers (61%) and a strong concentration in Brazil's Southeast region (77.25%)[16]. Conversely, our study in the field of Nutrition showed a majority of female researchers (67.5%). Similar to the findings in Medicine, the highest concentration of Nutrition researchers was also observed in the Southeast region[17].

An important observation from our cross-sectional analysis of CNPq researchers in Pulmonology is that scientific output is concentrated in a limited number of brazilian states. Six states contain 100% of researchers, whereas São Paulo and Rio Grande do Sul were responsible for 67.8% of the CNPq researchers. All researchers were identified only in three brazilian regions: Southeast, South and Northeast. These findings in the area of Pulmonology have been observed by us in previous studies, both in Medical Clinic[18] and in the area of Neuroscience[19]. In Medical Clinic, five states of the brazilian were responsible for approximately 90% of the researchers, and the state of São Paulo accounted for about 60% of them. Often, the high concentration of researchers in certain brazilian states and institutions is related to the training Centers and locations that have the oldest and most consolidated postgraduate programs, as observed in a study of Pediatrics[20].

The categories with the highest absolute number of papers published are 2 and 1B. However, this scenario changes when analyzing the relative numbers of articles per researcher. The average of Scientific Production was significant mainly in category 1A. We consider that the observed increase in productivity among Pulmonology researchers is linked to the overall growth of brazilian scientific

output and reflects the impact of various incentives established by national research agencies[21]. One such incentive is the enhancement of postgraduate program evaluations, conducted by the Coordination for the Improvement of Higher Education Personnel (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior [CAPES]), which prioritizes both the quantity and quality of published articles in its ranking system.

Another contributing factor is the availability of various scholarship programs, including the productivity in research scholarship, which fosters healthy competition among researchers, supports the training of new scientists, and encourages the publication of high-quality articles in reputable journals. The increase in scientific publications and their qualification in the field of brazilian pulmonology can be observed in two previous publications[22,23].

One of the important missions and activities of CNPq researchers is the development of student in the scientific initiation students, master and PhD. Here we can see an important participation of the Pulmonology researchers in the education of new researchers. Overall, the researchers formed 1263 students in total. As a general average, each of the 28 productivity grant researchers trained 45.1 students, including undergraduate research, master's, and PhD students. These important indicators of scientific quality were also observed in the areas of Dentistry, Public Health and Nursing[21,24,25].

Among the various metrics used to evaluate scientific performance, the H-index, introduced by Hirsch[26] in 2005, aims to capture both the quality and sustainability of a researcher's output. The H-index provides a single numerical value that effectively summarizes an author's research contributions and their impact. In simple terms, it combines two key dimensions of academic performance: productivity (the number of publications) and visibility (citations received). The H-index is designed to be robust, minimizing the influence of excessive publications with few citations and authors with fewer publications that have high citation impact[27]. Thus, H-index evaluates the consistency and continuity of excellence in publications.

In the present study, the median H-index at this group of 28 researchers was 27. This considerable value is compatible with the qualified production of the PQ brazilian pulmonology. Due to its numerous advantages as a bibliometric evaluation tool and the ease of calculation through the Web of Science database, the H-index has gained broad acceptance. It provides a single value that effectively summarizes a researcher's output and its impact[28]. We suggest that analyses could be further refined by incorporating the impact factor of journals as a covariate. Perhaps the correction of the H-index by the time of scientific activity of the researcher needs to be corrected.

The study's information was extracted from each researcher's Lattes curriculum vitae (CV), which constitutes a limitation. These limitations become apparent when analyzing how up to date

each CV is, since only the researcher can add new information. As a result, it is difficult to determine whether the reported data may be under- or overestimated. Nevertheless, the Lattes platform remains a relevant tool for registering academic information and promoting scientific dissemination both nationally and internationally. Moreover, the study presents limitations due to the absence of statistical analysis and the lack of temporal assessment, given its cross-sectional design.

Conclusion

The present study reveals that among Brazilian CNPq Research Productivity fellows identified in the field of Pulmonology, there is a predominance of males. It was also observed that there is a concentration of researchers in only three geographic regions: Southeast, South and Northeast and six states of Brazil. In general, this is a group with high scientific productivity and highlighted H-index. There was also an important involvement of the researchers with the supervision of scientific initiation, master's and PhD students. Knowledge of scientific production indicators is essential for the development of public policies and the targeted actions of research funding agencies.

Author Contributions

Conception and design of the research: Pedro Vitor Duarte Guimarães and Hercílio Martelli Júnior. **Data collection:** Pedro Vitor Duarte Guimarães and Hercílio Martelli Júnior. **Analysis, interpretation of the data and writing of the manuscript:** Pedro Vitor Duarte Guimarães, Árlen Almeida Duarte de Sousa, Fabrício Emanuel Soares de Oliveira and Hercílio Martelli Júnior. **Critical review of the manuscript regarding the intellectual content and final presentation:** Pedro Vitor Duarte Guimarães, Árlen Almeida Duarte de Sousa, Fabrício Emanuel Soares de Oliveira, Eduardo Araújo de Oliveira and Hercílio Martelli Júnior. All authors have approved the final version of the manuscript and declared themselves to be responsible for all aspects of the work, including ensuring its accuracy and integrity

Conflict of Interest

The authors declare that there are no conflicts of interest.

References

1. Fortunato S, Bergstrom CT, Borner K, Evans JA, Helbing D, Milojevic S, *et al.* Science of science. Science. 2018;359;6379:eaao0185. https://doi.org/10.1126/science.aao0185

2. White K. Science & Engineering Indicators. Publications Output: U.S. Trends and International Comparisons. Publication Output, by Region, Country, or Economy. [accessed July 21, 2023]. December 2019. Available from: https://ncses.nsf.gov/pubs/nsb20206/publication-output-by-region-country-or-economy

3. Oliveira EA, Oliveira MCL, Martelli DB, Colosimo EA, Silva LR, Lanza K, *et al.* COVID-19 pandemic and the answer of science: a year in review. An Acad Bras Ciênc. 2021;93(4):e20210543. https://doi.org/10.1590/0001-3765202120210543

4. Martelli Junior H, Martelli DR, Silva ACS, Oliveira MCL, Oliveira E. Brazil's endangered postgraduate system. Science. 2019;363(6424):240. https://doi.org/10.1126/science.aav9015

5. Oliveira EA, Oliveira MCL, Colosimo EA, Martelli DB, Silva LR, Silva ACS, et al. Global scientific production in the pre-Covid-19 Era: An analysis of 53 countries for 22 years. An Acad Bras Ciênc. 2022;94(suppl.3):e20201428. https://doi.org/10.1590/0001-3765202220201428

6. Bustamante MMC, Hipólito J, Delgado PGG, Ferrante L, Vale MM. The future of Brazilian science. Nature Human Behaviour. 2023;7:825-7. https://doi.org/10.1038/s41562-023-01597-7

7. Dias GP, Martelli DRB, Costa SM, Andrade RS, Oliveira EA, Martelli Júnior H. Scientific Production of Researchers from the Brazilian Council for Scientific and Technological Development (CNPq) in the Neuroscience area. Rev Bras Educ Med. 2020;44(2):e049. https://doi.org/10.1590/1981-5271v44.2-20190225.ING

8. Sales GH, Martelli DRB, Oliveira EA, Dias VO, Oliveira MCLA, Martelli-Júnior H. Evaluation on the Scientific Production in Fields of Medicine: a Comparative Study. Rev Bras Educ Med. 2017;41(2):290-8. https://doi.org/10.1590/1981-52712015v41n2RB20160099

9. Andrade RS, Martelli DRB, Swerts MSO, Oliveira EA, Martelli-Júnior H. Scientific production of the Brazilian Council for Scientific and Technological Development (CNPq) researchers in the field of Oral Medicine and Oral Pathology granted with a scientific productivity fellowship. Oral Surg Oral Med Oral Pathol Oral Radiol. 2018;126(6):553-4. https://doi.org/10.1016/j.oooo.2018.07.057

10. Oliveira EA, Pecoits-Filho R, Quirino IG, Oliveira MC, Martelli DR,Lima LS, et al. Perfil e Produção científica dos pesquisadores do CNPq nas áreas de Nefrologia e Urologia. Braz J Nephrol. 2011;33(1):31-7. https://doi.org/10.1590/S0101-28002011000100004

11. Gonçalves E, Santos MIP, Oliveira EA, Martelli-Junior H. Scientific in Pediatrics Produced at the CNPq. Rev Bras Educ Med. 2014;38(3):349-55. https://doi.org/10.1590/S0100-55022014000300009

12. Oliveira MCLA, Martelli DR, Quirino IG, Colosimo EA, Silva ACSE, Martelli-Junior H, et al. Profile and scientific production of the Brazilian Council for Scientific and Technological Developmente (CNPq) researchers in the field of Hematology/Oncology. Rev Assoc Med Bras. 2014;60(6):542-7. https://doi.org/10.1590/1806-9282.60.06.012

13. Dias GP, Martelli DR, Almeida LB, Barbosa GFA, Oliveira EA, Martelli-Junior H. Scientific production of the Brazilian National Council for Scientific and Technological Development (CNPq) researchers in the fields of tropical medicine and infectious diseases. Rev Soc Bras Med Trop. 2019;52:1-3. https://doi.org/10.1590/0037-8682-0034-2019

14. Larivière V, Ni C, Gingras Y, Cronin B, Sugimoto CR. Bibliometrics: global gender disparities in science. Nature. 2013;504(7479):211-3. https://doi.org/10.1038/504211a

15. Motter SB, Brandão GR, Iaroseski J, Spadoa JL, Alves AV, Assis Brasil CM, *et al.* Women representation in academic and leadership positions in surgery in Brazil. American Journal of Surgery. 2022;223(1):71-5. https://doi.org/10.1016/j.amjsurg.2021.07.023

16. Keffer GM, Sousa AAD, Oliveira FE, Magalhães MJS, Oliveira EA, Martelli Junior H. Evaluation of Brazilian women's participation in the CNPQ in the field of medical research. Rev Bras Educ Med.

2024;48(2):e028. https://doi.org/10.1590/1981-5271v48.2-2023-0271.ING

17. Pinho L, Martelli DRB, Oliveira EA, Martelli-Júnior H. Scientific production of researchers in the Nutrition field with productivity fellowships from the National Council for Scientific and Technological Development (CNPq). Rev Nutr. 2017;30(6):553-81. https://doi.org/10.1590/1678-98652017000600001

18. Martelli DR, Oliveira MC, Pinheiro S, Dias VO, Silva ACSE, Martelli-Junior H, *et al.* Profile and scientific output of researchers recipients of CNPq productivity grant in the field of medicine. Rev Assoc Med Bras. 2019;65(5):682-90. https://doi.org/10.1590/1806-9282.65.5.682

19. Romano-Silva MA, Correa H, Oliveira MCL, Quirino IG, Colosimo EA, Martelli DR, et al. Perfil e análise da produção científica dos pesquisadores brasileiros em Neurociência Clínica. Arch Clin Psychiatry (São Paulo). 2013;40(2):53–8. https://doi.org/10.1590/S0101-60832013000200001

20. Oliveira MCL, Martelli DR, Pinheiro SV, Miranda DM, Quirino IG, Leite GL, et al. Profile and scientific production of Brazilian National Council of Technological and Scientific Development researchers in Pediatrics. Rev Paul Pediatr. 2013;31(3):278-84. https://doi.org/10.1590/S0103-05822013000300002

21. Barata RB, Goldbaum M. Perfil dos pesquisadores com bolsa de produtividade em pesquisa do CNPq da área de saúde coletiva. Cad Saúde Pública. 2003;19(6):1863-76. https://doi.org/10.1590/S0102-311X2003000600031

22. Carvalho CR, Baldi BG, Jardim CV, Caruso P. Publication of the impact factor of the Brazilian Journal of Pulmonology: a milestone on a long and arduous journey. J Bras Pneumol. 2012;38(4):417–8. http://dx.doi.org/10.1590/S1806-37132012000400001

23. Carvalho CRR. Publicações do Jornal Brasileiro de Pneumologia. J Bras Pneumol. 2013;39(1):1–4. https://doi.org/10.1590/S1806-37132013000100001

24. Cavalcante RA, Barbosa DR, Bonan PRF, Pires MBO, Martelli-Jr. Perfil dos pesquisadores da área de odontologia no Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq). Rev Bras Epidemiol. 2008;11(1):106-13. https://doi.org/10.1590/S1415-790X2008000100010

25. Santos MIP, Silveira M, Oliveira EA, Martelli DR, Dias VO, Verissimo FM, et al. Avaliação da produção científica, patentes e formação de recursos humanos da Enfermagem Brasileira. Rev Bras Enferm. 2015;68(5):846-54. https://doi.org/10.1590/0034-7167.2015680512i

26. Hirsch JE. An index to quantify an individual's scientific research output. PNAS. 2005;102(46):16569-72. https://doi.org/10.1073/pnas.0507655102.

27. Boell SK., Wilson CS. Journal impact factors for evaluating scientific performance: Use of h-like indicators. Scientometrics. 2010;82:613-26. https://doi.org/10.1007/s11192-010-0175-y

28. Oliveira EA, Colosimo EA, Martelli DR, Quirino IG, Oliveira MC, Silva LS, et al. Comparison of Brazilian researchers in clinical medicine: are criteria for ranking well-adjusted? Scientometrics. 2012;90(2):429-43. https://doi.org/10.1007/s11192-011-0492-9