EDITORIAL

International collaborative/co-authored research publications from India – Recent trend from PubMed

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ABSTRACT

Extensive research collaborations have been established globally, which are expected to produce internationally co-authored research publications. India has emerged as a key player, driven by its population, disease burden, pharmaceutical capacity, and policies. In the world ranking, India's research output reached third (2024). Reflecting its active role in addressing global health challenges, international collaborations also grew from 18.92% (2010) to 24% (2022). These partnerships improved India's research impact, with co-authored papers getting higher citations. Despite this, India's collaboration rate still trails many nations. A comparison of year-wise internationally shared publications in PubMed over the last 10 years is made to understand the recent trend. The study confirms the expected nonuniformity in the global partnership in publication. The reasons for co-authorship—whether for genuine or strategic reasons—are complex. Expertise in pharmaceuticals, a scientific approach to traditional medicine, and digital health positions enable India to be a key partner for low- and middle-income nations. At the same time, other factors might influence the partnership with developed countries. Programs such as the India-UN Development Partnership Fund and the use of AI and IoT in healthcare demonstrate India's leadership in developing scalable, culturally aware, and affordable health solutions. These developments emphasize India's expanding influence in global health research and innovation.

Keywords: India-International co-authorship, PubMed, Publications, Health sciences.

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Recent trend of India's internationally co-authored publications in PubMed

Over the last ten years, the global health research environment has experienced notable changes. There has been a move toward more collaborative publications, probably fuelled by a rise in shared research efforts. Greater collaboration in health research is a positive sign for the public, as it reflects the growth of an interconnected model of shared responsibility towards global or common health challenges. Additionally, India has also advanced in its health research and outcomes over the last decade. Factors such as India's large population, substantial disease burden, significant pharmaceutical ingredient sources, robust pharmaceutical industry, widespread research facilities, and supportive policies may have contributed to this growth.

In 2013, India ranked ninth in the number of papers (articles and reviews) published. Data shows that by 2016, the ranking had risen to fifth place, overtaking Japan and trailing the United States, Mainland China, the United Kingdom, and Germany. India's research output doubled from 2015 to 2024. In 2024, the number of published papers from India surpassed that of the United Kingdom, securing the third position overall.[1] The South Asian Association for Regional Cooperation (SAARC) regions accommodate a good proportion of the world population, and, of late, there has been significant growth in scientific publications from these regions.[2] In 2010, international collaborations constituted 18.92% of India's total research output, increasing to 22.98% by 2019, with a more accelerated growth observed after 2016.[3] In 2022, India's international collaboration rate was 24%.[4] Interestingly, like other SAARC countries, India also collaborates more with countries outside the region despite shared commonalities in culture and lifestyle with its neighbours.[2] India's top collaborative partners include the United States, Saudi Arabia, the United Kingdom, Mainland China, and South Korea. Between 2015 and 2024, collaborations with Saudi Arabia grew from 1.5% to 6.6% of India's total output (Figure 1), whereas collaborations with other nations experienced more gradual growth.[1] The G20 Research and Innovation Scorecard 2025 suggests that Saudi Arabia is the second collaborative region for Indian publications, including all types of collaborations.[1]

Publications by Indians with international authors have experienced substantial growth. During 2010-2019, international collaborations by Indian authors were around 20%, while the domestic collaborations ranged around 15%.[3] By 2020, 32.35% of Indian papers involved international collaboration, a significant increase from 20.73% in 2001, with a compound annual growth rate (CAGR) of 12.27%.[5] Despite this growth, India's rate of international collaboration

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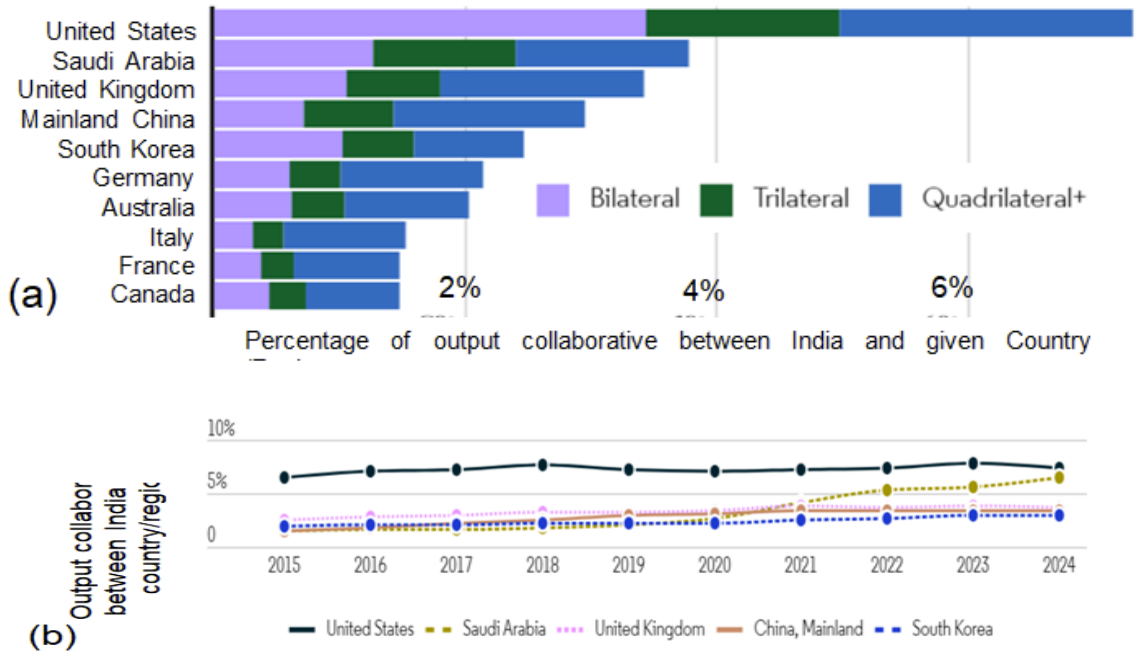

Figure 1: (a) All types of collaborations between India and different countries/regions; (b) Trend of output collaborations between India and a given country/region. The graphs are adopted from the G20 Research and Innovation Scorecard 2025.[1]

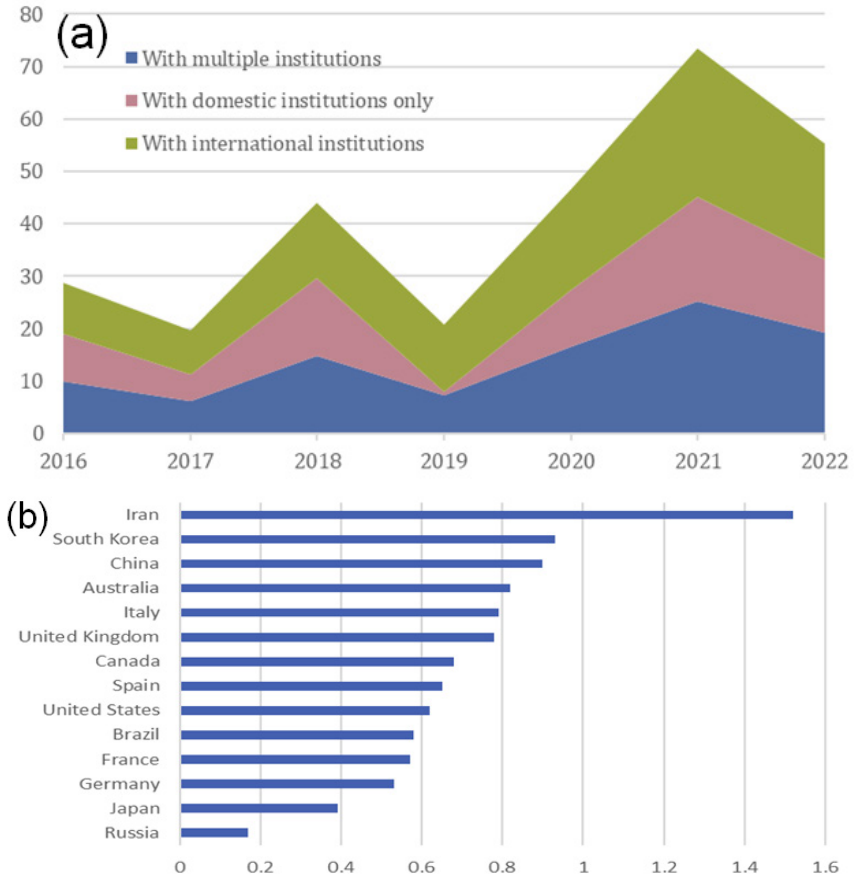

Figure 2: (a) Percentage yearly changes in co-authorship patterns in publications from India. (b) Relative citation index for India in 2020. Data source – Science & Engineering Indicators.[4]

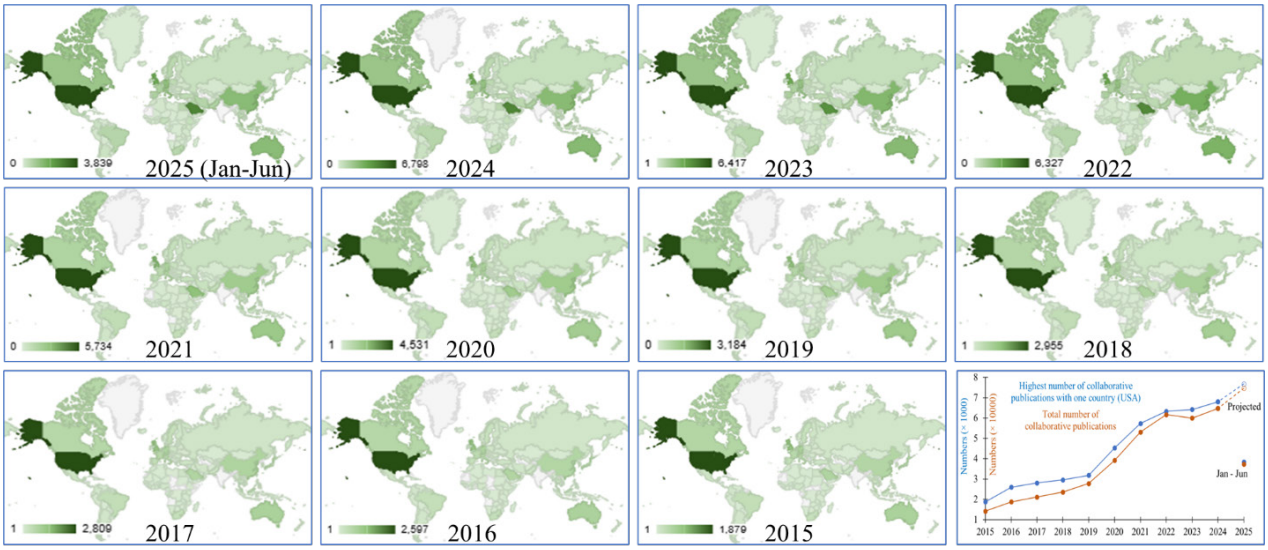

Figure 3: The distribution of internationally co-authored publications from India as appeared in PubMed.

still falls behind many countries, irrespective of whether they are in the brackets of top paper-producing countries or not.[4] Among India's internationally collaborative papers, approximately 50% have an Indian researcher as the lead (first) author, and over 50% of the authors in these papers are from India. The Indian indigenous scholarly ecosystem is highly productive but slightly depends on international collaborations for impact and heavily relies on them for visibility.[5] This could be an important reason for the rise in international co-authorship while the fall in domestic co-authorship (Figure 2a). Therefore, the question arises whether the published co-authored publications are more towards visibility and citations or for true collaborations. Whatever the intent, Indian science publications have undoubtedly benefited from this trend.

These international collaborations have significantly boosted India's scientific output and influence. Average citation per paper (ACPP) is as high as 18.65 for internationally co-authored (collaboration) papers, while the same is 7.95 for domestic papers. A greater percentage of international papers are cited (89% versus 76.75% for domestic).[3] Internationally co-authored papers have notably higher citation rates, which encourages further collaborations and co-authored publications. As expected, the citation rates are not uniform for all international co-authorship. Interestingly, the cross-national citations of internationally co-authored publications showed a pattern in 2020. The relative citation index (RCI) for own publications was >10 for Iran, Australia, Brazil, and Russia, between 8-9 for Canada, Spain, Italy, France, and Japan, between 6-7 for the United Kingdom and Germany, and <4 for the United States and China.[4] This self-RCI, which may be considered necessary by domestic researchers for international collaborations, suggests that internationally co-authored publications are valued differently in each country/region. India is standing alone with a self-RCI of 5.83[4] with maximum RCI for India from Iran (Figure 2b). The pattern of citation, as shown in Figure 2b, is also influenced by the high number of publications from each country.

India's dominant research-partnering countries (2010-2019) by volume included the United States (33.09%), the United Kingdom (12.42%), Germany (9.19%), China (8.87%), South Korea (7.72%), and Australia (7.06%).[3] Recent trends show a significant rise in collaboration with South Korea and Saudi Arabia.[1,5] The areas of these bilateral collaborations strategically match India's national health priorities and broader global health issues, showing a practical approach to partnerships.

Another practical advantage is avoiding the substantial costs associated with publishing in high-impact journals. Sometimes, including co-authors from native English-speaking countries provides an extra edge in preparing the manuscript and a lower probability of rejection at the desk level. Thus, co-authorship may not be a true reflection of research collaboration.

Collaborations with countries like Switzerland result in an ACPP of 35 and over 93% of papers being cited.[3] Therefore, the collaboration, and hence, co-authored publications should also follow the same pattern. However, it is not true. This shows that collaborations improve research quality and visibility, helping India rise in research excellence.

A visualization of global trends in co-authored publications with India in health and medicine from PubMed, covering 2015 to the first half of 2025. From 2015 to 2020, there was a clear and consistent increase in collaborative publications, shown by the darkening green shades in various countries and the rising total numbers. By 2021 and 2022, the total collaborations exceeded 5,000 and 6,000, respectively, continuing the upward trend. In 2023 and 2024, the total counts are over 6,000, and the first half of 2025 shows a total of 3,839, suggesting the full-year total will likely maintain the high collaboration trend. The line graph clearly demonstrates a strong positive correlation between publication numbers

and years, indicating steady growth in international scientific collaboration over the decade. Both lines follow a similar upward trend. The graph also features a projected dotted line for the second half of 2025, implying the trend is expected to persist. The visualizations in Figure 3 collectively depict a robust and expanding trend of India's international scientific collaboration, with the United States as a key partner and Saudi Arabia emerging as a recent partner. The data indicates a consistent rise in collaborative research and publication output during the studied period.

Indian researchers express a keen interest in engaging in international collaborations, and the nation's intrinsic strengths render it an attractive partner on the global stage. India possesses a robust foundation in the pharmaceutical and manufacturing sectors, which should be strategically highlighted. As a leading global pharmaceutical hub, India can deliver cost-effective healthcare solutions, particularly for low- and middle-income countries. The growth of South-South cooperation and India's emerging leadership in global health naturally extend this function. Initiatives such as the India-UN Development Partnership Fund exemplify India's capacity to lead and fund sustainable, demand-driven projects across developing nations. There is also considerable potential to integrate traditional medicine systems, such as Ayurveda, into collaborative research endeavors. This integration would serve to promote indigenous knowledge and foster culturally appropriate, innovative, and economically viable healthcare models. Furthermore, the adoption of digital health tools and artificial intelligence presents transformative opportunities. India's proactive approach to sharing digital health expertise and exploring applications of AI and IoT in healthcare creates new pathways for scalable, affordable care, particularly in underserved and remote regions.

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