

An Analysis of Publication Trends in Anesthesiology-specific Journals Using Latent Dirichlet Allocation Natural Language Processing

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Intro: Analysis of research trends can provide insight into the interests of a specialty. Yet, the large number of publications makes it infeasible to summarize trends manually. Latent Dirichlet allocation (LDA) is a state-of-the-art topic modeling algorithm. This algorithm can be applied to identify trends in a research field. We aimed to quantify trends in publications across all anesthesiology-specific journals using LDA.

Methods: The entire PubMed database was downloaded on December 21, 2018. We included publications in journals categorized by Scimago as “anesthesiology and pain medicine”. Article meta-data and abstracts were then analyzed. The paper country of origin was determined based on the affiliation of the first author. Using the LDA algorithm, 200 sets of topic words were identified from the abstracts. The topics were then manually assigned to 30 research subjects. These subjects correspond to chapter titles from two prominent textbooks. More than one subject could be assigned if relevant.

Results: 138,640 articles were identified as published between 1975-2018. There has been growth in both the numbers of publications and specialty-specific journals. From 647 articles in 13 journals in 1975 to 4124 articles in 60 journals in 2018. The top five countries publishing in anesthesiology journals in 2018 were the United States (26%), China (9%), India (8%), Germany (6%), and the United Kingdom (6%). In contrast, the United States contributed 35% of publications in 1990. Basic science and pain management have remained prominent subject areas of research. Quality improvement and perioperative medicine showed growth in representation in the anesthesiology literature. Neuromuscular blockade, inhalational anesthetics, and mechanical ventilation were less featured over time (Figure 1).

Conclusions: In the anesthesiology literature, there has been an increase in geographical diversity and the number of publications. This mirrors trends seen in medicine as a whole. The growth in perioperative medicine and quality improvement publications corresponds with growth in fellowships and emphasis in the Accreditation Council for Graduate Medical Education curricula. This analysis of anesthesiology publications provides context for growth in the specialty, as well as practice trends and shifts in research interests.

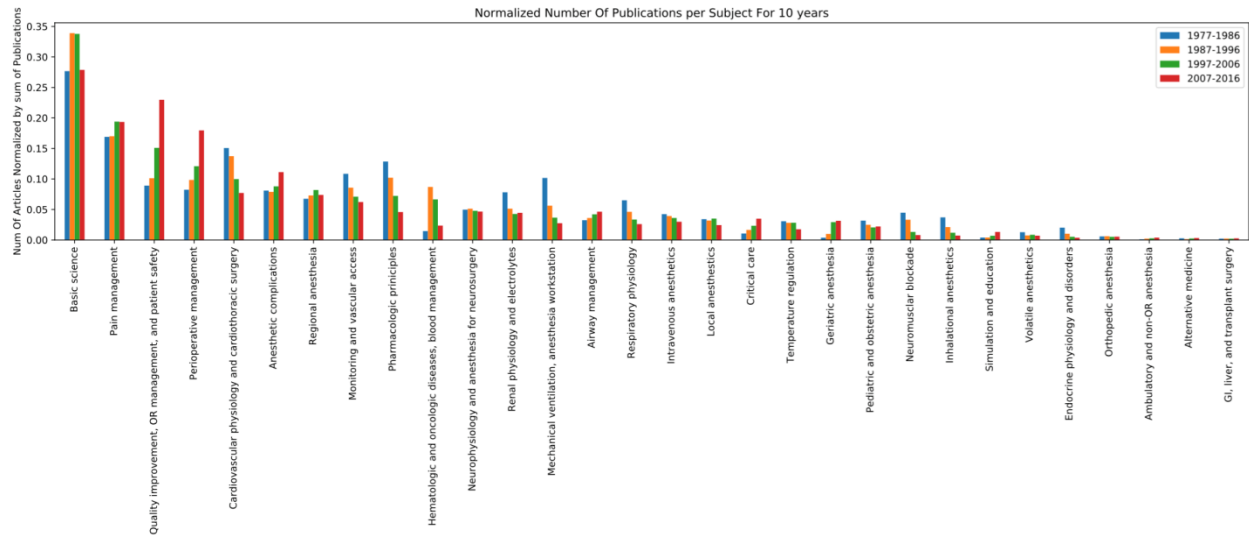


Figure 1. Normalized number of publications per subject by 10 year blocks

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