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Global Bibliometric Analysis of Research on Perinatal Transmission and Prevalence in Maternal HIV, Hepatitis B, and Hepatitis C Infections

Maternal HIV, Hepatit B ve Hepatit C Enfeksiyonlarında Perinatal Bulaş ve Prevalansa İlişkin Araştırmaların Küresel Bibliyometrik Analizi

Demircioğlu et al. Perinatal Transmission and Prevalence in Maternal HIV, Hepatitis B, and Hepatitis C Infections

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Abstract
Introduction: This study aimed to perform a bibliometric analysis of research addressing the risk and prevalence of perinatal transmission in maternal human immunodeficiency virus (HIV), Hepatitis B, and Hepatitis C infections.
Materials and Methods: Using predefined keywords, we retrieved all articles published between 1982 and 2025. Only original research articles written in English and published after 1982 were included. A total of 1.058 records were identified, of which 1.016 were published in English. Data were exported, and duplicate records were removed using Mendeley. Quantitative analyses and visualizations were conducted using Microsoft Excel, VOSviewer, and the Bibliometrix package in R Studio. After duplicate removal, 1.015 articles were included in the final analysis.
Results: The United States was the most productive country, contributing 457 articles (44.98%). Newell was the most prolific author, with 32 publications. The most highly cited article was "Combination antiretroviral strategies for the treatment of pregnant HIV-1-infected women and prevention of perinatal HIV-1 transmission," which received 738 citations. Overall, research output addressing perinatal transmission risk and prevalence in maternal HIV, Hepatitis B, and Hepatitis C infections has increased markedly over the past three decades.
Conclusion: The increasing volume of publications reflects growing international interest and an expanding research scope in this field. Over the past three decades, a substantial rise has been observed in studies examining perinatal transmission risk and prevalence in maternal HIV, Hepatitis B virus, and infections.
Keywords: Maternal HIV, maternal Hepatitis B, maternal Hepatitis C, perinatal transmission, vertical transmission

Öz
Giriş: Yapılan çalışmanın amacı; maternal insan immün yetmezlik virüsü (HIV), Hepatit a ve C enfeksiyonlarında perinatal bulaş riski ve prevalansını bibliyometrik analiz yöntemiyle incelemektir.
Gereç ve Yöntem: Çalışmada, Web of Science veri tabanında anahtar kelimeler girildikten sonra 1982–2025 yılları arasında yayımlanan tüm makaleler taranmıştır. Yalnızca orijinal araştırmalar (n = 1,058), İngilizce dilinde yazılmış olanlar (n = 1,016) ve 1982 sonrasındaki yayınlar analiz edilmiştir. Veriler dışa aktarılmış, Mendeley programında duplikasyon kontrolü yapılmış dublikasyon ve analizler Microsoft Excel, VOSviewer ve Bibliometrix (R Studio) yazılımlarıyla görselleştirilmiştir. Nihai analiz, tekrarlayan yayınlar çıkarıldıktan sonra 1,015 makale üzerinden yapılmıştır.
Bulgular: Amerika Birleşik Devletleri 457 makale (%44,98) ile en üretken ülke olarak belirlenmiştir. En üretken yazar 32 makale ile Newell'dır. En çok atıf alan çalışma ise "Combination antiretroviral strategies for the treatment of pregnant HIV-1-infected women

and prevention of perinatal HIV-1 transmission" başlıklı makale olup 738 atıf almıştır. Ayrıca, son otuz beş yılda maternal HIV, Hepatit a ve C enfeksiyonlarında perinatal bulaş riski ve prevalansı araştırma eğilimlerinde belirgin bir artış gözlenmiştir.
Sonuç: Bu alandaki çalışmaların sayısındaki artış, konunun uluslararası ölçekte daha fazla ilgi gördüğünü ve araştırma kapsamının genişlediğini göstermektedir.
Anahtar Kelimeler: Maternal HIV, maternal Hepatit B, maternal Hepatit C, perinatal bulaş, vertikal bulaş

Introduction

Maternal viral infections, particularly human immunodeficiency virus (HIV), Hepatitis B virus (HBV), and Hepatitis C virus (HCV), represent a major global concern for maternal and neonatal health[1–3]. These infections share common perinatal transmission pathways and have significant implications for mother-to-child transmission, neonatal morbidity, and long-term health outcomes. Preventive strategies, including antenatal screening, antiviral therapy, and neonatal immunoprophylaxis, constitute overlapping public health interventions across these conditions, providing a strong rationale for their combined evaluation within a single bibliometric framework[4].

Although numerous studies have investigated the perinatal transmission and prevalence of maternal HIV, HBV, and HCV infections, their global publication trends, collaborative networks, and primary research foci have not yet been systematically examined[5]. Bibliometric analyses offer quantitative and visual assessments of key research indicators, such as publication output, citation patterns, author and country collaborations, and major thematic domains within a given field[6,7]. These approaches have become increasingly valuable for identifying research gaps and emerging areas of scientific interest.

Among the tools commonly used in bibliometric research, software such as VOSviewer and Bibliometrix enables the visualization of co-authorship networks and thematic clusters, thereby facilitating more nuanced interpretations of bibliographic data[6,7]. In recent years, these methods have been increasingly applied, particularly in maternal and child health research, to evaluate global research trends and evolving thematic priorities[5].

The present study aims to conduct a global bibliometric analysis of research addressing perinatal transmission and prevalence in maternal HIV, HBV, and HCV infections. By systematically examining publication output, citation impact, author and country collaborations, key conceptual themes, and their temporal evolution, this study seeks to elucidate the scientific production dynamics within this field and identify existing research gaps[5–7].

Materials and Methods

Search Strategy

The bibliographic data for this study were obtained from the Web of Science database. The search was conducted on November 2, 2025, and included articles published between 1982 and 2025. Searches were limited to English-language publications and were performed within the title, abstract, and keyword fields using the following terms: "maternal HIV," "maternal Hepatitis B," "maternal Hepatitis C," "perinatal transmission," "vertical transmission," "prevalence," "epidemiology," and "risk."

In the initial screening phase, 1.356 records were identified. As the earliest relevant publication dated back to 1982, all records published between 1982 and 2025 were considered. After applying inclusion criteria, only original research articles (n = 1.058) written in English (n = 1.016) and published after 1982 were retained for further analysis. Bibliographic data were exported, and duplicate records were screened using Mendeley. Following duplicate removal (n = 1), a total of 1.015 articles were included in the final analysis. Quantitative analyses and visualizations were performed using Microsoft Excel, VOSviewer, and the Bibliometrix package in R Studio.

Data Processing and Analysis

The bibliographic data retrieved from the Web of Science database were exported for further processing, and duplication control was conducted using the Mendeley software. Following this procedure, no additional duplicate records were identified. Bibliometric analyses and visualizations were carried out using Microsoft Excel, VOSviewer, and Bibliometrix.

Key bibliometric indicators, including publication year, authorship, country of origin, journal distribution, and citation counts, were analyzed. In addition, collaboration networks and keyword co-occurrence analyses were conducted to identify research collaborations and thematic patterns. The main analytical steps applied in this study are summarized in Table 1.

Data Processing and Analysis

Data Processing

The data required for the bibliometric analysis were obtained from the Web of Science database. Relevant records were exported and transferred to Microsoft Excel for initial organization. The data were categorized by article, country, author, and journal. Duplication control was subsequently performed using the Mendeley software, and one duplicate record was identified and removed.

In the next step, a word preprocessing procedure was conducted. Terms were extracted from author keywords, titles, and abstracts and processed using VOSviewer (Leiden University, Leiden, the Netherlands) and the Bibliometrix software package.

Statistical Analysis

Citation reports, publication trends, and the most productive countries, authors, and journals were analyzed using the R-based Bibliometrix software. Word frequency analyses and visualizations were performed using VOSviewer, which is freely accessible at www.vosviewer.com. Bibliometric network visualizations were generated using nodes and links. Nodes represent words or concepts included in the analysis, and node size indicates the frequency of the corresponding item within the field. Links represent co-occurrence relationships between nodes, with line thickness and proximity reflecting the strength of the association between items[7,8].

Results

Summary of the Data

Between 1982 and 2025, a total of 1.015 articles were identified, originating from 342 sources and collectively containing 21.739 references. On average, each document received 33.10 citations. The bibliographic dataset comprised 6.968 authors, who collectively

used 1.609 keywords. A total of 35 documents were single-authored. The proportion of publications involving international collaboration was 34.29% (Figure 1 and Table 2).

Countries

The screening identified publications from 92 countries addressing the risk and prevalence of perinatal transmission in maternal HIV, HBV, and HCV infections. The United States ranked first, contributing 457 publications (44.98%), followed by England (n = 107), South Africa (n = 100), China (n = 73), Italy (n = 70), France (n = 61), Brazil (n = 55), Canada (n = 50), Kenya (n = 42), and India (n = 30). The United States also exhibited the highest level of international collaboration (Figure 3 and Table 4).

Authors

The analysis included a total of 6,968 authors. The author with the highest number of publications was Newell, with 32 articles. Additionally, Newell had the highest h-index and the greatest total number of citations (Table 3, Figure 5)[9].

The journals AIDS, JAIDS: Journal of Acquired Immune Deficiency Syndromes, PLOS One, Journal of Medical Virology, and Journal of Infectious Diseases were among the leading publications reporting studies on global research trends in perinatal transmission risk and prevalence in maternal HIV, Hepatitis B, and Hepatitis C infections. Analysis of 2025 metrics showed that AIDS had the highest CiteScore and was also the most cited journal that year (Figure 6, Table 4).

The authors' keywords and their frequencies are shown in the visualization generated using VOSviewer. Circle sizes correspond to the frequency of keyword usage, while colored clusters indicate groups of keywords that frequently occur together. Connecting lines represent the relationships and co-occurrence frequencies between keywords. The visualization displays ten distinct color clusters. The largest cluster is associated with the keyword "vertical transmission," followed by "HBV" and "HIV-1" (Figure 7).

Citation Topic (Meso Level)

Meso-level citation analysis reveals the thematic structure and interdisciplinary distribution of literature on perinatal viral transmission. As shown in Table 5, publications in this field are predominantly focused on HIV (n = 532) and hepatitis (n = 366). In contrast, other infectious diseases and related disciplines have a relatively small number of publications.

Most Cited Articles

The most cited articles are summarized in Table 6. The first column lists the first author and publication year, the second column provides the journal name and DOI, and the third column shows the total number of citations. The study by Cooper et al.[14] ranks first, with 738 citations (Table 6).

Discussion

This bibliometric analysis provides a comprehensive overview of global research on perinatal transmission risk and prevalence in maternal HIV, HBV, and HCV infections between 1982 and 2025. By evaluating publication output, citation impact, and thematic patterns, the study highlights both the evolution of scientific interest and existing gaps in the literature. The annual growth rate of 8.55% indicates that this topic has gained substantial global significance in public health and clinical practice[6].

Overall, the results show a steady and marked increase in research output over time, reflecting growing international awareness of the public health importance of preventing mother-to-child transmission of viral infections. The dominance of high-income countries, particularly the United States and several European nations, underscores the role of strong research infrastructure and funding mechanisms in shaping the global scientific landscape. At the same time, the increasing contributions from regions with a high disease burden suggest a gradual diversification of research activity.

This analysis reveals a predominantly HIV-centered structure in the literature on perinatal viral transmission, with HBV and, particularly, HCV being comparatively underrepresented. The predominance of HIV-related publications is evident in publication volume, citation counts, and the prominence of HIV-focused journals and authors. While this pattern reflects the historical prioritization of HIV in global health research and the early development of effective preventive interventions, it should not be interpreted as indicating lower clinical or public health importance of HBV or HCV[24,25]. The epidemiology, natural history, and prevention strategies of HBV and HCV differ substantially from those of HIV; therefore, findings derived from HIV-related data should not be directly extrapolated to hepatitis infections without careful consideration[26,27].

The relatively small number of studies investigating the perinatal transmission of HBV and HCV underscores a notable gap in the literature. Considering the global burden of chronic hepatitis and its long-term consequences for maternal and child health, additional epidemiological, clinical, and implementation-focused research is warranted[26]. Furthermore, the distribution of meso-level citation topics reveals limited representation of obstetrics and gynecology, reproductive biology, and health policy, suggesting that perinatal viral transmission has been primarily studied from a biomedical perspective[27]. Context-specific studies from low- and middle-income countries—where access to screening and preventive interventions may be inconsistent—are particularly essential to inform effective and sustainable prevention strategies[25].

Moreover, the high level of multiauthorship and international collaboration observed in this field reflects the complex and multidisciplinary nature of research on perinatal infections. The concentration of scientific output within specific research groups indicates that long-standing expertise has significantly influenced the development of this research area, as demonstrated by the sustained contributions of leading investigators[9–12].

Keyword analyses indicate that research on perinatal transmission has adopted a multidisciplinary approach, encompassing prevention strategies, clinical outcomes, and maternal-to-child transmission mechanisms.

In summary, this bibliometric analysis demonstrates substantial growth and diversification in research on the perinatal transmission of maternal viral infections while highlighting the persistent dominance of HIV-focused literature. Addressing the relative underrepresentation of HBV and HCV in future studies will be critical for developing equitable and effective global strategies to prevent perinatal transmission and improve maternal and neonatal health outcomes.

Study Limitations

This study has several limitations. First, the analysis was limited to publications indexed in the Web of Science database; consequently, relevant studies available in other databases may not have been captured. Second, restricting inclusion to English-language articles may have reduced the representation of research conducted in non-English-speaking regions. Additionally, bibliometric analyses rely on citation-based indicators, which can be influenced by factors unrelated to scientific quality, including

journal visibility, publication practices, and regional citation behaviors. Furthermore, recently published articles may exhibit lower citation counts due to time-lag effects. Despite these limitations, this study provides a comprehensive and informative overview of global research trends in perinatal transmission of maternal HIV, Hepatitis B, and Hepatitis C infections.

Conclusion

This bibliometric analysis demonstrates a sustained and growing global scientific interest in preventing the perinatal transmission of maternal HIV, Hepatitis B, and Hepatitis C infections. Despite this overall growth, research output remains disproportionately concentrated in specific countries and established research groups, highlighting persistent inequalities in global research capacity. Addressing these disparities will require targeted capacity-building initiatives, improved data-sharing mechanisms, and the expansion of collaborative research networks that actively involve low- and middle-income countries.

Although HIV-related research dominates the field, evidence regarding the perinatal transmission of Hepatitis B and C remains relatively limited. Future epidemiological and clinical studies focusing on HBV and HCV are therefore essential to inform comprehensive and equitable prevention strategies. Strengthening international collaborations, sustaining multidisciplinary research approaches, and aligning scientific outputs with global maternal and child health policies may substantially contribute to reducing perinatal transmission and improving maternal and neonatal outcomes worldwide.

Ethics

Ethics Committee Approval: As this study is a bibliometric analysis, ethics committee approval was not required. Nevertheless, the study was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent: Not required.

Footnotes

Authorship Contributions

Concept: T.D., Design: T.D., İ.Ö.D., Data Collection or Processing: Z.B., Analysis or Interpretation: Z.B., Literature Search: T.D., İ.Ö.D., Z.B., Z.O., Writing: T.D., İ.Ö.D., Z.B., Z.O.

Conflict of Interest: No conflict of interest was declared by the author(s).

Financial Disclosure: The author(s) declared that this study received no financial support.

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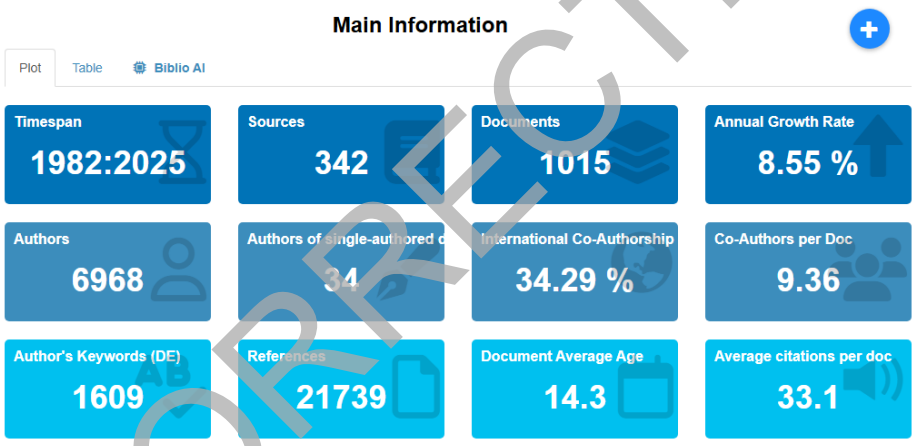

Figure 1. Summary of main bibliometric indicators.

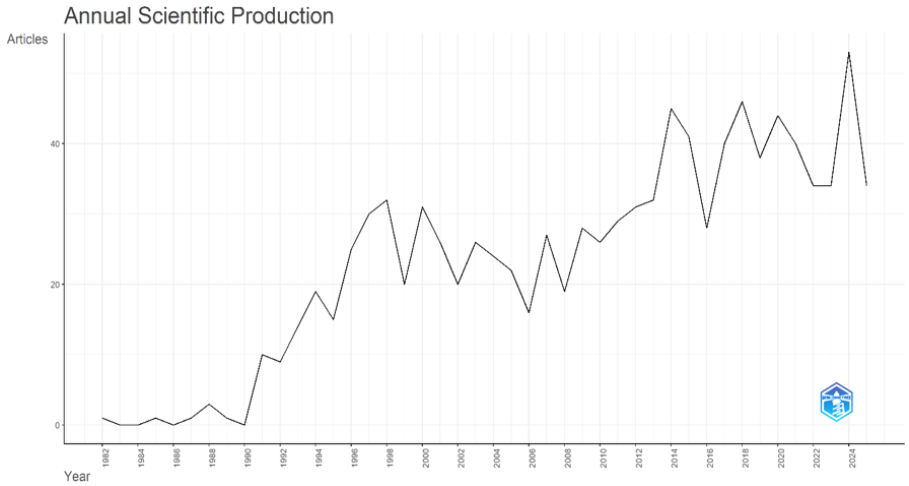

Figure 2. Annual scientific production.

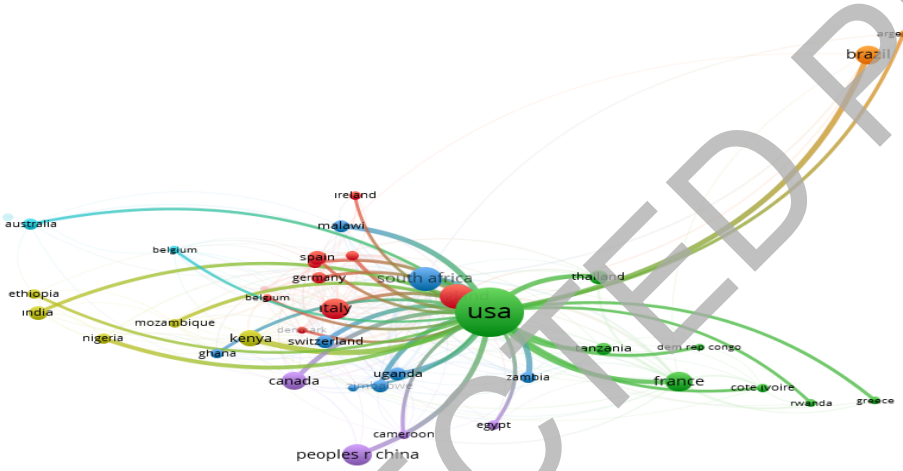

Figure 3. Country collaboration network.

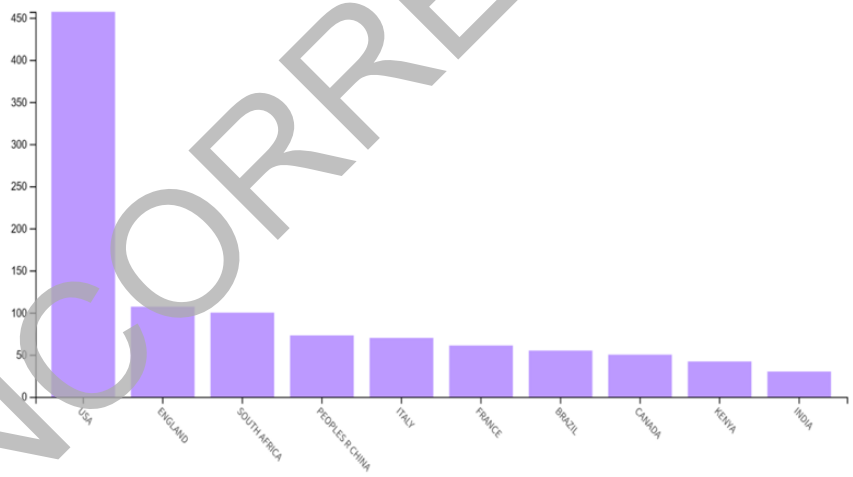

Figure 4. Ranking of countries publishing on the risk and prevalence of perinatal transmission in maternal HIV, Hepatitis B, and Hepatitis C infections.
HIV, human immunodeficiency virus.

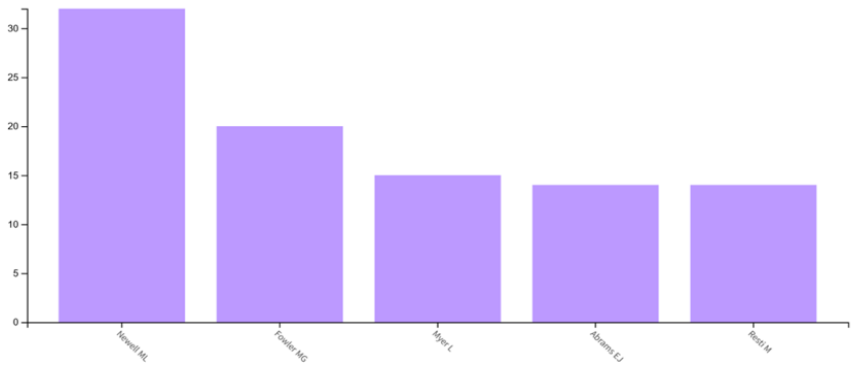

Figure 5. Most prolific authors.

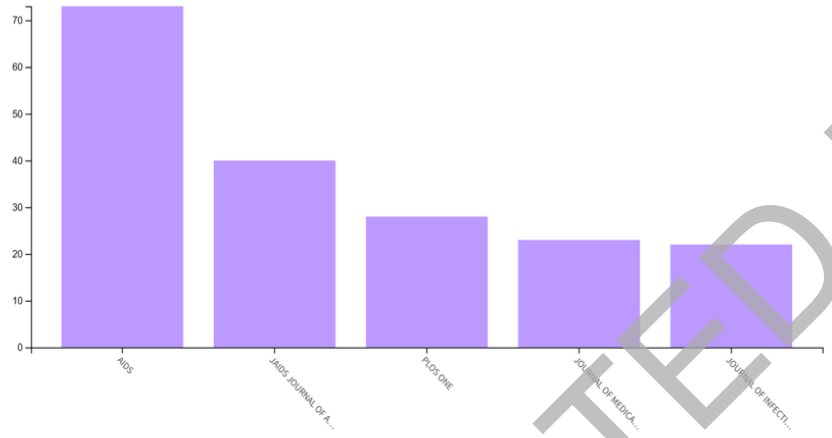

Figure 6. Most productive journals.

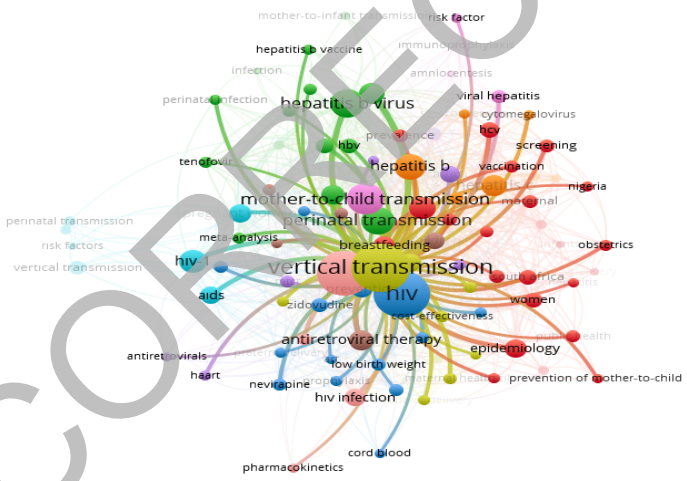

Figure 7. Visualization of authors' keywords and their frequencies.

Table 1. Search strategy.

Type	**Criteria**
Database	Web of Science
	(maternal HIV OR maternal "Hepatitis B" OR maternal "Hepatitis C*") AND ("perinatal transmission" OR "vertical transmission*") AND ("prevalence" OR "epidemiology" OR "risk*")
Subject area	Bibliometric analysis of perinatal transmission risk and prevalence in maternal HIV, Hepatitis B, and Hepatitis C infections
Time period	1982–2025
Document type	Article

Publication status	Final
Publication type	Journal
Language	English
Duplication control	November 2, 2025 (Mendeley); duplicates = 1
Included in the analysis	1.015

Table 2. Summary of bibliographic information.

Description	**Conclusion**
Basic data information	
Time span	1982–2025
Sources (journals)	342
Number of documents	1.015
Annual growth rate (%)	8.55
Average age of documents	14.3
Average citations per document	33.1
References	21.739
Document contents	
Keywords (ID)	1.597
Author keywords (DE)	1.609
Authors	
Authors	6.968
Authors of single-authored documents	34
Author collaborations	
Single-authored documents	35
Co-authors per document	9.36
International co-authorship (%)	34.29
Document type	
Articles	1.015

Table 3. Five most productive authors publishing on this topic.

Author	**The number of publications**	**h-index**	**Total citations**
Newell[9]	32	25	2.537
Fowler[10]	20	14	1.129
Myer et al.[11]	15	8	299
Abrams et al.[12]	14	12	834
Resti et al.[13]	14	12	619

Table 4. Top five journals publishing the most on this topic and their citation counts (based on 2025 data).

Journals[a]	**Numbe of publications**[b]	**h-index**	**Citations per article**	**Annual citations**
	Total			
1	73	41	65.82	4.805
2	40	23	33.53	1.341
3	28	12	14.57	408
4	23	15	31.22	718
5	22	17	74.36	1.636

[a]Journals: 1) AIDS, 2) JAIDS: Journal of Acquired Immune Deficiency Syndromes, 3) PLOS One, 4) Journal of Medical Virology, 5) Journal of Infectious Diseases. [b]Bibliometric analysis of perinatal transmission risk and prevalence in maternal HIV, Hepatitis B, and Hepatitis C infections. HIV, human immunodeficiency virus.

Table 5. Distribution of publications on perinatal viral transmission by meso-level citation topics.

Citation topic (meso level)	**Number of publications (n)**
HIV	532
Hepatitis	366
Sexually transmitted ınfections	19
Virology: Identification & Sequencing	17

Parasitology: Malaria, toxoplasmosis, & coccidiosis	11
Healthcare policy	8
Obstetrics & gynecology	8
Reproductive biology	6
Immunology	5
Virology–general	4
Antibiotics & antimicrobials	4
Photoproductivity	4
Tuberculosis & leprosy	3
Virology: Tropical diseases	3
Other fields*	26

This table presents the distribution of publications on perinatal viral transmission according to meso-level citation topics. Other fields include nursing, psychiatry, nutrition, oncology, and various basic science disciplines. HIV, human immunodeficiency virus.

Table 6. Top 10 most cited articles.

Authors	Years	Journal	DOI	Total citations
Cooper et al.[14]	2002	Journal of Acquired Immune Deficiency Syndromes	10.1097/00126334-200204150-00009	738
Blanche et al.[15]	1989	New England Journal of Medicine	10.1056/NEJM198906223202502	504
Townsend et al.[16]	2008	AIDS	10.1097/QAD.0b013e3282f9b67a	427
Giaquinto et al.[17]	2005	Clinical infections	10.1086/427287	420
Coutsoudis et al.[18]	2004	Journal of Infectious Diseases	10.1086/420834	324
Landesman et al.[19]	1996	New England Journal of Medicine	10.1056/NEJM199606203342501	300
Fideli, et al.[20]	2001	Aids Research and Human Retroviruses	10.1089/08892220175029023	299
Wiseman et al.[21]	2009	Medical Journal of Australia	10.5694/j.1326-5377.2009.tb02524.x	287
Zou et al.[22]	2012	Journal of Viral Hepatitis	10.1111/j.1365-2893.2011.01492.x	279
Tuomala et al.[23]	2002	New England Journal of Medicine	10.1056/NEJMoa991159	278