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## **A SYSTEMATIC REVIEW OF THE RESULTS-BASED FINANCING ON MATERNAL MORTALITY RATE IN SUB-SAHARAN AFRICA**

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### **ABSTRACT**

Results based financing as a component of health financing is one of the endorsed panacea to maternal mortality rate globally. The study undergoes a systematic review on the impact of results-based financing on maternal mortality rate in SSA. The study draws the results from the Scopus search database which has been argued to be more friendly and accurate than PubMed and Web of Science. The Scopus reported that there have been more publications and citations in the area of maternal health care and results-based financing during the period under study, this shows that, results based financing has becoming an interesting topic since its inception in SSA. The Scopus search database indicated that on 58 bibliometric studies retrieved on maternal health care, more were focusing on health delivery systems, maternal health services and health financing. The study also shows that despite the role played SSA countries in promoting maternal health care, the maternal mortality rate is still far beyond the United Nations target of reaching 70 deaths per 100 000 live births. Therefore, it is recommended that, SSA countries should source enough finance from local stakeholders, international organisations, among others in order to finance health system delivery. More so, they should develop other financing models that will capacitate the health sector to reduce maternal mortality.

### **KEY WORDS**

Results-based financing, maternal mortality rate, Scopus, health system.

Achieving high levels of maternal health care is one of the top goals that every nation in the world aspires to. In SDG 3, the United Nations expressed concern about maternal health care, stating that the world should cut maternal mortality rates to 70 deaths per 100,000 live births between 2015 and 2030. The struggle for a reduced mortality rate has been suggested to be vital for all stakeholders worldwide to strive relentlessly toward its decrease. Despite this endorsement from the United Nations, the health system, particularly Sub-Saharan Africa, has received minimal financial aid from governments, limiting its ability to reduce maternal mortality rates. Apart from that, most governments in Africa have failed to pay enough salaries for health workers which result in high brain drain. Furthermore, WHO (2021) argued that maternal hospitals in Africa are still using maternal service equipment purchased during the colonial era, such as operation theaters, in-patient rooms, and neonatal intensive care units, and that they are adequate to care for a large number of patients. Kuruvilla et al. (2019) claimed that medical equipment assists numerous services in the healthcare sector, and management representatives, such as clinical engineers, must monitor and maintain the assets by conducting various maintenance tasks throughout the equipment life cycle. As a result, if medical equipment is left unmonitored, the quality of health treatment suffers significantly, which is the biggest challenge affecting the Sub-Saharan African health system. In light of these challenges, the maternal mortality rate for sub-Saharan Africa declined from 870 deaths per 100,000 live births in 2000 to 530 deaths per 100,000 live births in 2017, marking a 38.6 percent decline. The skilled birth attendance rate for Sub-Saharan Africa increased from 43 percent of births in 2000 to 64 percent of births in 2022, and only 52 percent of pregnant women got four or more prenatal consultations. In addition, only 18.4% of women received postnatal care after birth. The



United Nations, in line with SDG3.1, emphasized that utilizing the service of a skilled birth attendant (SBA) at delivery is indispensable to expedite the reduction in maternal mortality.

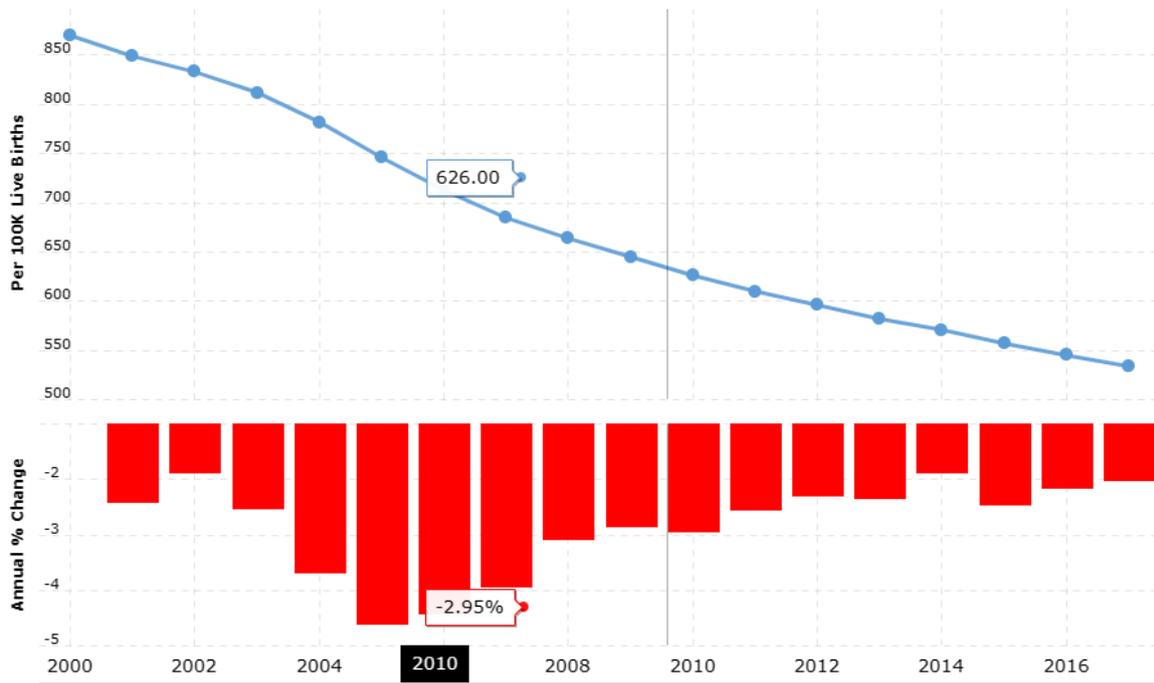


Figure 1 – Maternal deaths between 2000 and 2017 (Source: WHO)

The United Nations (2022) argued that, although maternal and child health (MCH) indicators showed some subsequent signs of improvement, maternal mortality remained far short of the SDG target of reducing the global maternity ratio (MMR) to 70 maternal deaths per 100,000 live births by 2030. A plethora of empirical evidence shows that the health delivery system requires more attention from all governments in Sub-Saharan Africa to develop financial models that will provide the necessary finance needed to revamp the sector. Nair et al. (2020), argued that, health funding is required as a panacea that will enable progress toward universal health care by enhancing effective service coverage and financial protection. Sign et al. (2021) added that millions of individuals in Sub-Saharan Africa lack access to health care owing to exorbitant expenses, and only the wealthy obtain low-quality care even when they pay out of pocket. Ditch et al. (2022) asserted that Sub-Saharan Africa (SSA) has a dichotomized health system in which the public sector lacks the capacity to invest in health services to ensure optimal operation, while the private sector only serves a portion of the population. Sub-Saharan Africa should develop a universal model that either abolishes or slackens user fees for selected services in order for poor people to access health services. For example, in Ghana, there were significant improvements in maternal health care delivery after the government removed user fees for pregnant women (Donnelly, 2015). In addition, various financial models were employed in sub-Saharan Africa in an attempt to expedite the reduction of maternal mortality rates, such as results-based financing, voluntary prepaid insurance schemes, pooling of funds, and purchasing of funds, among others (Zeng et al., 2019). These programs were aimed at improving poor populations' access to health services, including by reducing financial barriers, strengthening health service quality through improved health facility performance and management, and promoting results orientation, thus contributing to sustainability in health service provision (Brown et al., 2020). Among all these health financing models, this study focuses on the effectiveness of result-based financing in reducing the maternity mortality rate in sub-Saharan Africa. Binyaruka (2020) noted that result-based financing (RBF) programs have a considerable role in boosting service utilization and reducing maternal mortality rates in SSA. Weng (2020) posited that result-based funding (RBF) plays a crucial role in alleviating



financial barriers that prevent individuals from getting maternal health care. Schuster et al. (2019) pointed out that results-based financing in SSA since its inception has caused the maternal mortality rate to fall as access to health has increased. However, Sign et al. (2020) claimed that there is little evidence on the cost-effectiveness of results-based funding (RBF) initiatives. Seban (2021) highlighted that in costing analyses, RBF operational expenditures were shown to be significant, raising questions about the cost-effectiveness of these therapies. As a result, given limited resources, RBF programs compete for scarce funds with other healthcare efforts. As a result, determining their value for money is crucial. Gage (2021) proposed that cost-effectiveness data from results-based funding (RBF) is crucial for legislators making healthcare priority-setting decisions. In accordance with the arguments posed by other researchers, it is also important for this study to determine whether or not results-based funding (RBF) was effectively implemented in SSA throughout the study period. The main goal of this research is to conduct a systematic review of the effect of results-based funding on maternal mortality rates in sub-Saharan Africa. The research considers 45 sub-Saharan African countries; the study assumes that these countries have similar socioeconomic features. These countries have adopted the results-based financing model enacted by the United Nations as a panacea for the maternal mortality rate. The same objective is enshrined in SDG 3.1, which aims to reduce the maternal mortality rate to below 70 deaths per 100,000 live births by 2030. The framework adopted in this study used the proposal made by Thein et al. (2019), who systematically reviewed health financing mechanisms in the Association of Southern Asian Nations countries and China. Their framework has highlighted elements of health funding mechanisms such as revenue raising, purchasing, equity, and universal financial protection. Therefore, this study closely factored in the significant elements of results-based financing, namely equity in funding allocation, revenue raising, financial protection, and the performance of results-based funding. This study seeks to provide a systematic review of the empirical evidence from sub-Saharan Africa and give recommendations on how best SSA could implement results-based financing to accrue all its intended benefits. The methods of literature search and analysis are presented in the method section, which is followed by a presentation of the results and their discussion.

## METHODS OF RESEARCH

In order to access relevant documents and confirm the robustness of the analysis, researchers undertake bibliometric analysis using several databases. However, using a separate database is only suitable if the volume of literature on the issue under research is small. Because the subject under research contains a huge volume of literature, numerous databases were not appropriate for this study. According to the literature assessment, the Scopus database is significantly more significant than PubMed and Web of Science in terms of size and data analysis features accessible. As a result, this study employed Scopus to investigate the impact of results-based financing on maternal health care in SSA. Scopus is useful since it generates long and sophisticated searches. Because bibliometric indicators and literature mapping are difficult to execute on documents collected from disparate databases, bibliometric investigations generally employ a single database. Scopus includes all of PubMed and has twice the amount of indexed journals as Web of Science. Scopus is thus considered almost as thorough as PubMed and Web of Science.

*Search strategy.* The researcher did a detailed investigation of the issue, particularly distinct publications and systematic reviews, in order to come up with keywords that have been utilized to develop a complete search query that will assist this study retrieve the largest amount of documents that aid in dependable results. One approach employed was an examination of the abstracts of various empirical studies, the methodology employed, and other key phrases associated with maternal health care and results-based finance. The biggest disadvantage of examining multiple studies is that it accumulates more irrelevant material. To address this issue, the researcher only considered the abstract and title that contained the specified key terms.



The study was only searching a query that consists of phrases related to maternal health care and results-based financing. This was done in order to minimize the risk of including irrelevant documents.

*Exclusion criteria.* The study focuses on publications released between 2012 and 2023, and exclusively on materials published in English. Documents released before to 2012 were excluded from the study since SSA implemented results-based financing in 2012, making them unnecessary to include in the analysis. Furthermore, the study removed materials that did not include key phrases, as well as books from the analysis.

*Validation of the search strategy.* After multiple testing and fine-tuning, the general search query was determined. The search query was created with the following parameters in mind. The 58 mentioned papers that were retrieved should be devoid of false positives and within the scope of the research. Authors should have a comparable number of hits in the search strategy as they have in their Scopus profile. Furthermore, the journals are relevant to the topic of research. This method was inspired by a previously published bibliometric study. When a false-positive result was discovered, the search query was fine-tuned to refine it. Furthermore, the number of publications retrieved for active writers and the number of articles identified in their Scopus profile for the same authors were compared.

*Data export and bibliometric indicators.* Scopus' search function was used to regress a validated search query. The data obtained from Scopus was transferred to Microsoft Excel. The exported data includes the following information: the annual number of publications, the types of documents, languages, subject areas, the names of the nations engaged in publishing the recovered documents, authors, journals, author keywords, funding sponsors, institutions, and citations. The exported data were examined to provide the following bibliometric indicators: (1) annual publishing increase; (2) most common author keywords in retrieved documents; (3) top ten active nations, institutions, and journals; (4) citation analysis and top-cited documents; and (5) worldwide research collaboration. We used the mean number of citations per document and the Hirsh-index (h-index) as measures of scientific impact in the citation study.

*Network visualization maps.* To display study themes, the obtained literature was mapped. The VOSviewer was used to map the words in the titles and abstracts of the retrieved documents that had a minimum recurrence of 5 for research themes. Related words are clustered together and have the same hue on the map. The terms with the biggest node size have the highest frequency. Each group of terms in the same color signifies a study subject or theme. As a result, the number of clusters corresponds to the number of study themes found in the recovered papers.

The scientific impact of active journals and countries was evaluated using the number of citations per document.

The research collaboration and research themes were presented as network visualization maps using VOSviewer program.

## RESULTS AND DISCUSSION

The research query yielded 58 documents relating to the issue under consideration. The majority of the documents found were research and review publications. The retrieved documents were published by 386 writers in total, with an average of 6.6 authors per document. After 2019, the annual number of publications in SSA increased dramatically, and more than half of the retrieved publications were published in the last four years of the study period. During the study period from 2012 to 2023, both the cumulative number of citations and the number of publications increased in lockstep (Fig. 2). The number of articles increased, as did the total number of citations.

According to Figure 2, there was a substantial growth in journal publishing on health care and results-based finance from 2012 to 2020, with the value reaching 13 papers in 2020 before declining to 2 in 2023. The findings suggest that just three documents on results-based finance and maternal health care were published in SSA in 2012, followed by five in



2015, four in 2016, thirteen in 2021, and three in 2023. This obviously demonstrates that much more research on the role of health finance in SSA is required.

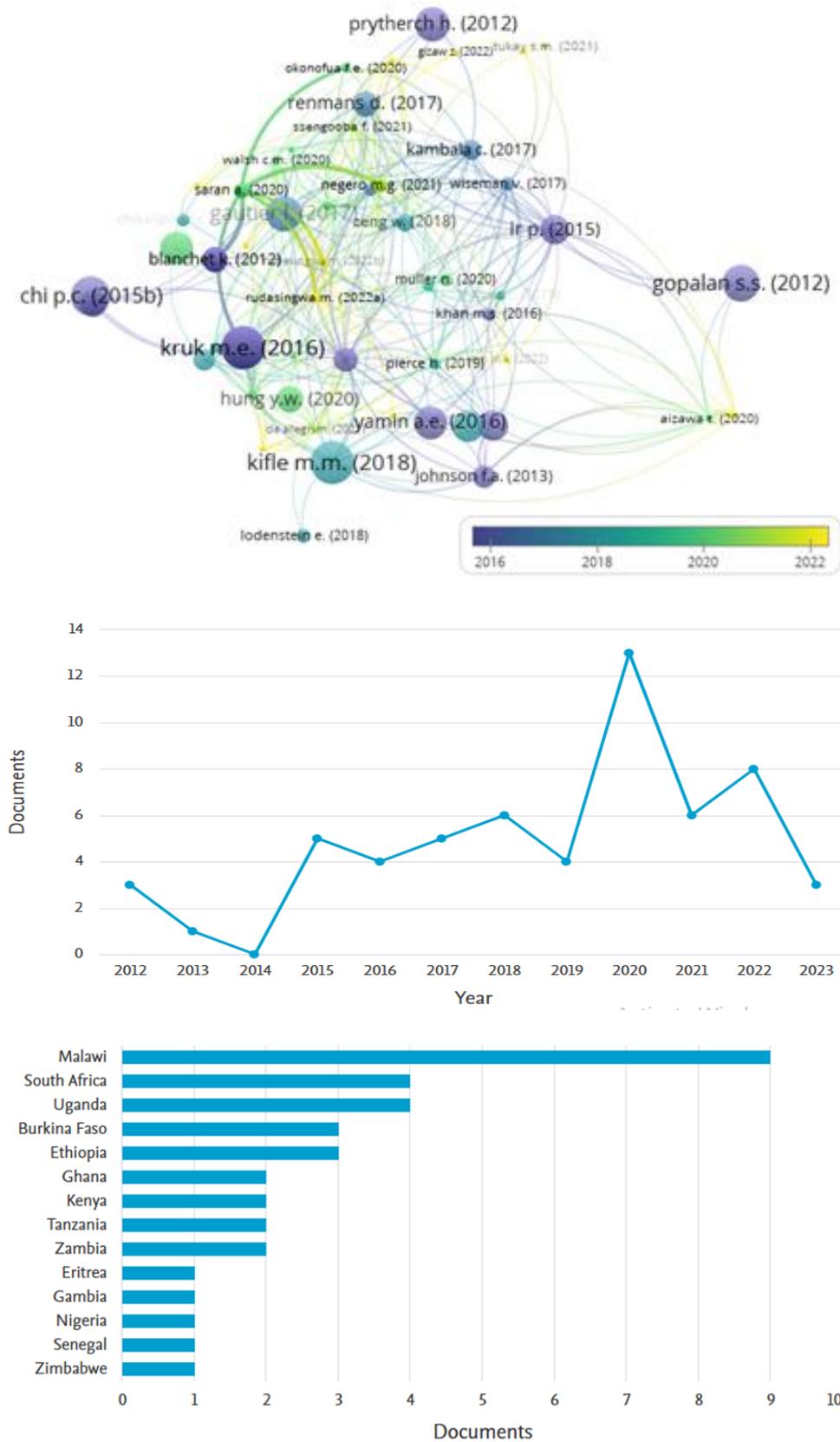


Figure 2 – Publication details by authors, years, selected countries





speak, results based financing as a panacea to maternal mortality rate is significant if it has been included in the development of SSA health care system. Due to these efforts by the SSA countries, there has been a notable decline the maternal mortality rate, even though the current rate is still alarming the United Nations, since it is still fall above the 70 death per 100 000 live births by 2030 (UN 2015).

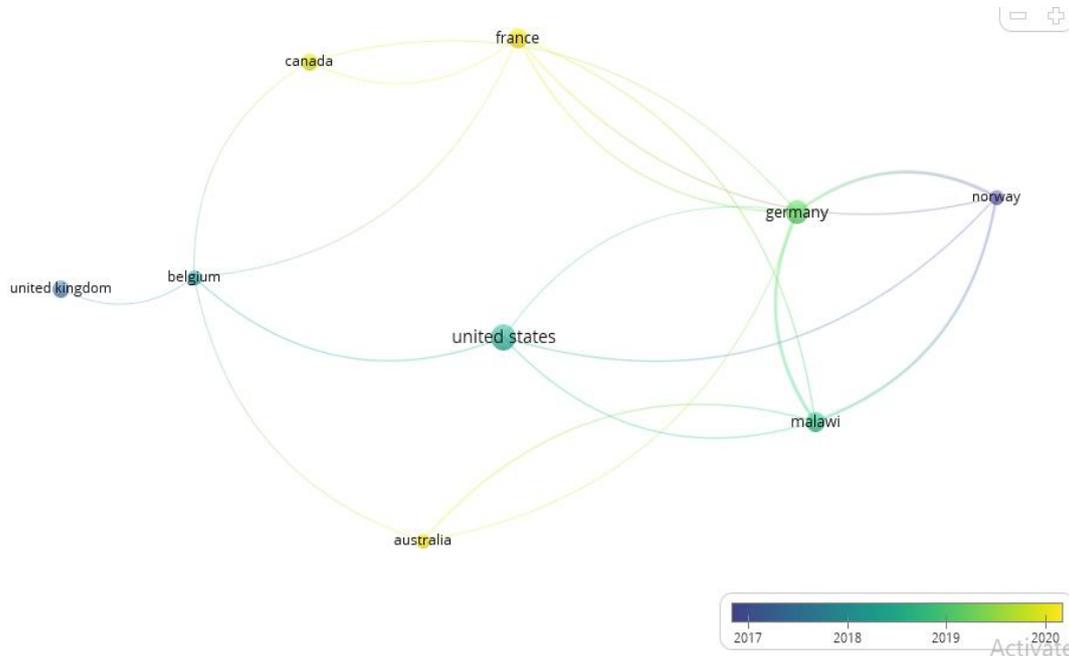


Figure 4 – Network Visualisation (Countries)

In addition, the network visualisation reported that Malawi and Uganda are the major key players in promoting health financing (results based financing) as a panacea to maternal health care improvement in SSA. In that way, Malawi's maternal mortality rate fell from 675 deaths per 100 000 live births in 2010 to 349 deaths per 100 000 live births in 2023, while Uganda's current maternal mortality rate is at 375 deaths per 100 000 live births (WHO, 2023). Therefore, despite the high of publications in these two countries a lot need to be done to reduce the maternal mortality rate to the target set by the United Nations of 70 deaths per 100 000 live births by 2030. In addition, Figure 4, shows that only Malawi is recognised as one of the SSA country that have invested in promoting health financing on maternal health care.

Furthermore, the Scopus search database indicated that on 58 bibliometric studies retrieved on maternal health care, more were focusing on health delivery systems, maternal health services and health financing. However, little attention were put on results based financing in total independent but was used in health financing. As a result, the current study is among the first to address this problem from a bibliometric standpoint. There were a few drawbacks to the current investigation. To optimize validity, the author used all potential and possible keywords. However, the possibility of missing some data remains. Another potential limitation is the usage of Scopus as a source for pertinent documents. Although Scopus is the largest database, many peer-reviewed journals in Asia, Africa, Latin America, and Eastern Europe are not indexed in Scopus. As a result, documents published in unindexed journals were overlooked. This may understate the production of some countries.

## CONCLUSION

The study investigated a systematic review on the effect of results based financing on maternal health care, in SSA, which is one of the top priority for United Nations SDGs 3.1. SSA governments, non-governmental organisations, policymakers and other international



players have also devoted their efforts through various measures to reduce maternal mortality care and other health issues. The Scopus search exhibited a remarkable growth in the number of publications between the period 2000 and 2023, more specifically in 2018 and 19 with a bulky of international research collaboration. The growth in the number of publication is due to various reasons. The United Nations in collaboration with international players, governments, NGOs and policymakers have called for every stakeholder around the globe to take adaptive measures and sourcing other ways of combating maternal mortality rate. In addition, the inception of results based financing as a component of health financing has received much debate from researchers over its effectiveness. This tend to converge with the steep rise in the number of publications. According to Scopus results, 58 publications were seen during the period under study in SSA, mean that the governments and institutions have provided the room for research expert to study on the area of health delivery system. Also, the steep growth in the number of publications emphasizes the fact that policymakers at the national and international levels are fully aware and are implementing measures in the area of climate change and food security by supporting research from both academic and non-academic centers to face the challenges of the twenty-first century. The Scopus search also showed that documents received a relatively high number of citations per document and high *h*-index. This is indicative of the importance of the topic and the high level of interest of researchers in this field. This is not surprising given that the topic is not limited to a geographical area. Results based financing and maternal health care have direct effects on health quality delivery system, wellbeing, and livelihood. The number of citations is also a function of the number of authors per document and the extent of international research collaboration and both were high for the investigated topic. The contribution of all SSA countries to the topic was also a motivating factor for collaboration and an increased number of citations. The finding that half of the top-cited documents were review articles and published in highly prestigious journals with high impact factors also played a positive role in the number of citations received by the retrieved documents.

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