



# **Radiology Publication Dynamic Topic Modeling Before & After COVID-19**

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# Disclosures

Leila Abdelrahman has no disclosures to report.



# Introduction

The COVID-19 pandemic dramatically shifted what radiologists were researching and discussing in the scientific literature. The literature lacks information about how these topics shifted before and after the pandemic. Thus, this work provides two main contributions:

1. A DTM that shows how term importance changed over time
2. A dynamic website to visualize how topics evolve during each 1 month period pre- and post pandemic.



# Curating the Literature

Journal Name	Total Article #
European Radiology	2843
Radiology	1764
AJR	1638
IEEE Transaction on Medical Imaging	986
Medical Image Analysis	696
Radiographics	500
<b>Total</b>	<b>8417</b>

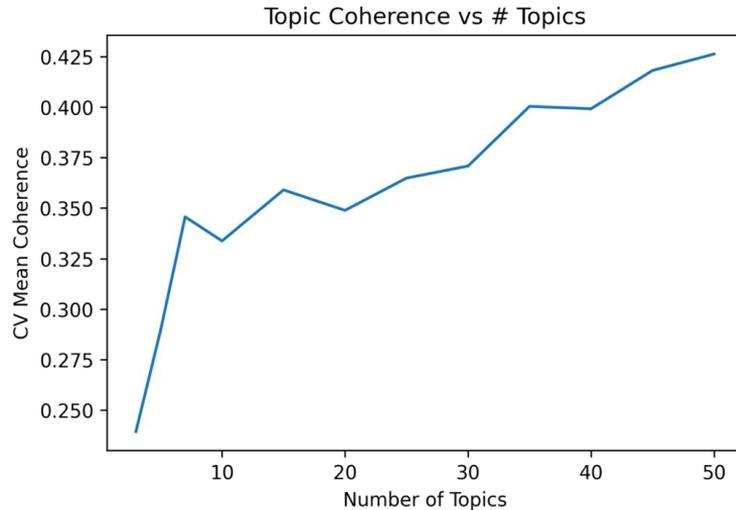
We generated a Python script to scrape the PubMed database for titles from 8 of the leading Radiology journals, as shown in the table below. We refined the search to yield articles published between September 1, 2018 and October 30th 2021



## Creating the Dictionary

To generate the data for input into the DTM model, we used the database article titles as our main corpus. We processed the titles by removing common stop words. After this preprocessing, we generated a dictionary with unique words that we used to train our DTM.

# Optimizing the DTM

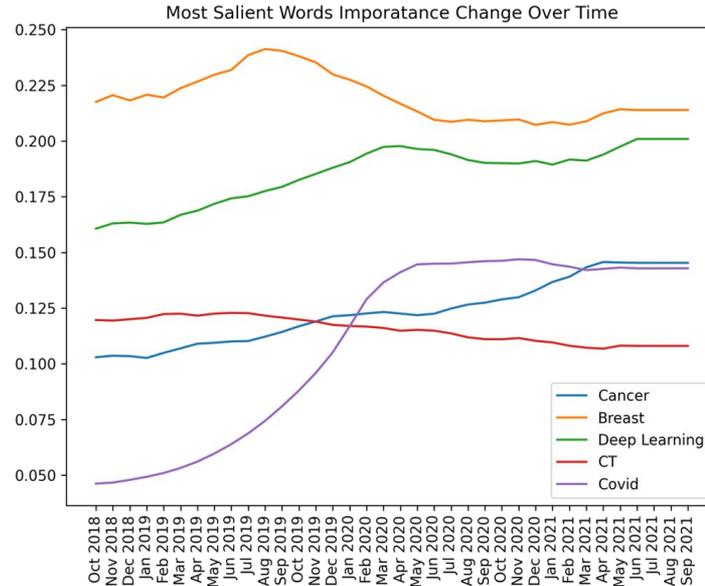


We then fed the dictionary and its associated bag of words (BoW) corpus into a sequential LDA model to generate various numbers of topics. We performed a search on the number of topics using the averaged topic coherence score over all time instances for each number of topics. We tested topics with a minimum of 3 and a maximum of 50 and found that 50 topics led to the highest average topic coherence.

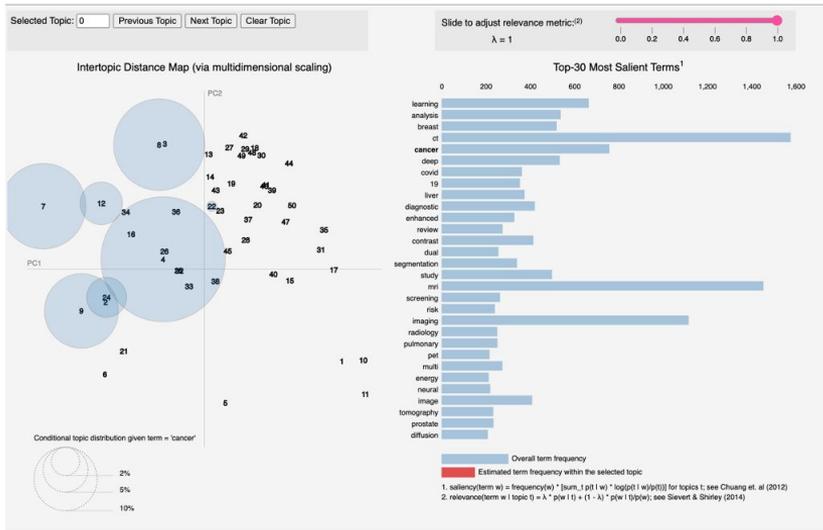
# Word Salience Over Time

The graph shows the changes in topic coherence vs number of topics. We then identified the top 5 most salient words and plotted their topic importance vs time period to show how their importance changed over time.

The graph also allows us to plot differences in how topics changed over time. The term "Covid" saw an exponential increase that matched the course of the pandemic.



# Visualizing Topic and How they Relate



We generated a dynamic website that allows users to visualize the topics as they change over time.

<https://leilaabdel.github.io/radiology-dtm/dtm/>



## Conclusion

We model how terms varied in their topic importance over time for 50 different topics created by training a DTM on radiology titles before and after the pandemic. This work can inspire other researchers to generate new research topics.



## Acknowledgements

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