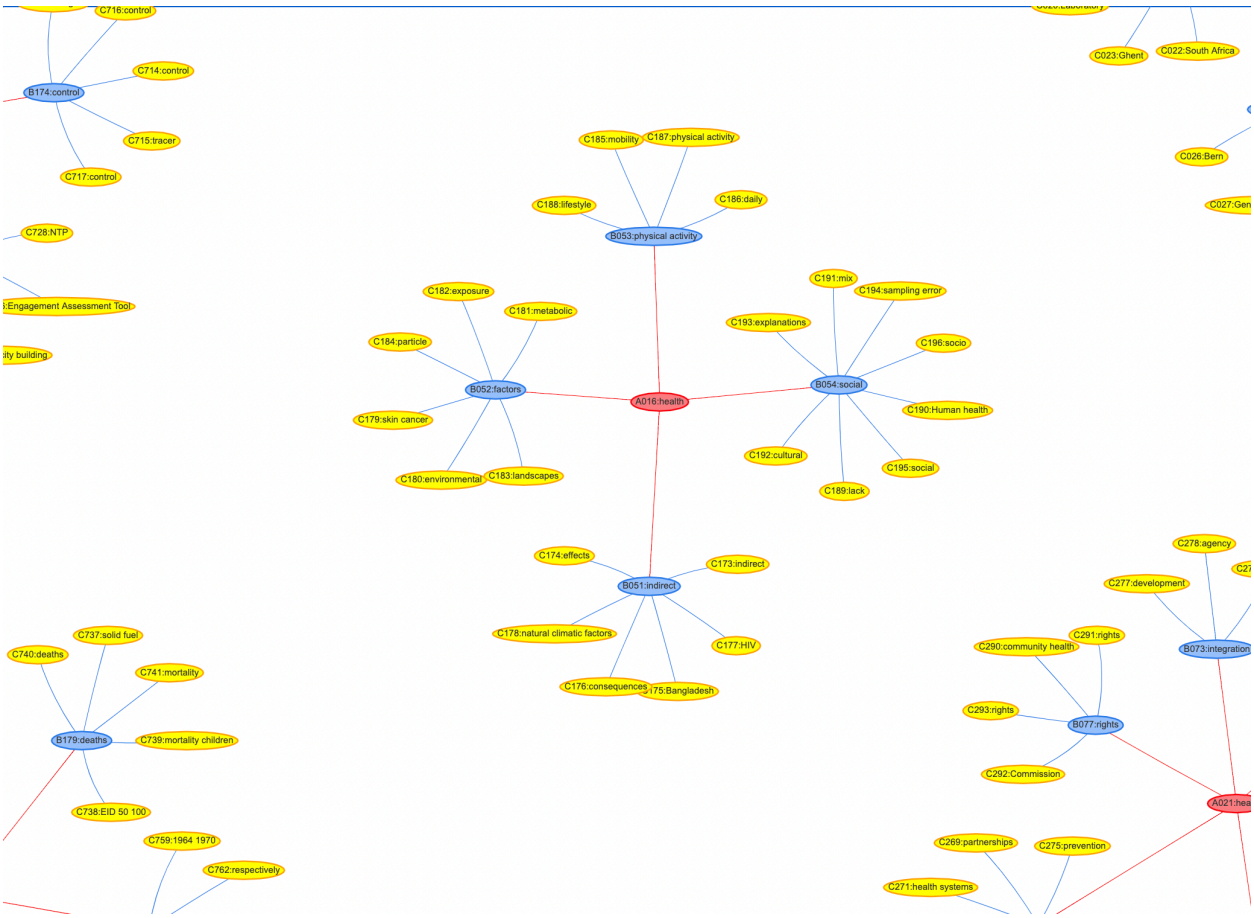
Climate Migration Analysis

Climate change is shown to increased migration from climate impacted locations. The aggregate cost of climate change, and migration due to climate change, on civilization and the whole world is under-researched and under-developed, and lacks *substantial* active engagement. The imperative to act is critical, existential and present. The goal of this study was to use machine learning to refine our scope of research and expertise in climate migration, and to gain exposure in machine learning and big data science.

The last two month I have worked closely with Dr. Robert Horten and Dr. Katherine Gundling studying the interconnection of climate change and migration. We used data from the the NIH, PubMed database. The query, “health, climate, migration”, yielded 470 abstracts from publications, etc… published between 1961 to 2021. This search was limited to human relevant studies only. To analyze the data we used unsupervised machine learning to semantically embed the data, and then used agglomerative hierarchical clustering to break the data into three nested tiers.

*We used semantic embedding to vectorize the abstract’s text by sentence. The sentences were vectorized in 512 dimensions using the spacy plugin for python, spacy-universal-sentence-encoder, https://github.com/MartinoMensio/spacy-universal-sentence-encoder/releases/download/v0.4.3/en_use_md-0.4.3.tar.gz#en_use_md-0.4.3 and other listed plugins.

*We employed agglomerative hierarchical clustering to tier the data into three nested tiers per mother (identified keyword): A, B, C.



Visual Aid for analyzing clusters. A (mother) clusters in RED, B clusters in BLUE, C clusters in YELLOW.

Clustering the data enabled a unique understanding of the data, and allowed to the analyst to concisely choose an article based on categorically understanding.

Key Insights:

*Chronic, long term advents to migration included sea level rise, drought, heat waves, fires, etc.

*Acute migration advents, forced displacement included hurricanes, fires etc…

*Health Risks inspired migration. Primarily vector borne disease, in mosquitoes, ticks and other animals for example.

*Also, relevant to the process of migration are the associated health risks, and threat someone's way of life.