COVID 19 – Socio-Economic Factors in the UK

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**Abstract**—Put here a brief summary of your work: analysis task, data, approach, main findings. Length: up to 200 words.

# Problem Statement

Here we will be looking at the COVID-19 statistics and comparing the spread of the virus in different areas and using the last census data to try to understand the various factors behind the spread of the virus.

To solve this problem, we have the COVID 19 case, death and Vaccine rates by UK region [2]. The ONS estimated age breakdown by region (as of August 2021). COVID 19 cases by age and region. A portion of the 2011 Census data showing the shared/unshared dwellings, number of cars, long term health and household deprivation [1]. Ideally, we would be using the 2021 census data, but it will not be released until 2023. We also have the geographic boundaries of the UK Local governments [3], so that we can plot this data onto a map.

# State of the Art

From one of SAGE’s reference papers [6], we can see that the government was interested in age group breakdowns different susceptibility to COVID 19. This was in response to the early data from China suggesting that older people were more susceptible to COVID but that younger age groups may be spreading the virus through their social contacts. From this paper we can see that different age groups spread the virus at different rates. This paper uses data from the first 4021 confirmed cases. They estimate a scaling factor for the transmissibility of COVID for each country.

In the BBC Pandemic project [7], the BBC collected contact tracing data from 40177 volunteers (who were tracked and filled in details of everyone they came in contact with. This study was conducted with the intention of being able to provide details of the average number of people that different age groups would come into contact with, so that this could be used in modelling future pandemics

# Properties of the Data

Our COVID 19 case data is at the local authority level (LTLA). The data we have from the census is at the same level, but some of the councils have been merged or split apart. Using Excel [4] we investigated the differences in councils, for the new merged councils we summed together their census data and for those splitting apart (Suffolk) we divided the data equally between them. We used Python’s Pandas library [5] to join up all of the census tables into one sheet.

# Analysis

## Approach

First paragraph...

Following paragraphs...

*<500 words, 1 diagram*

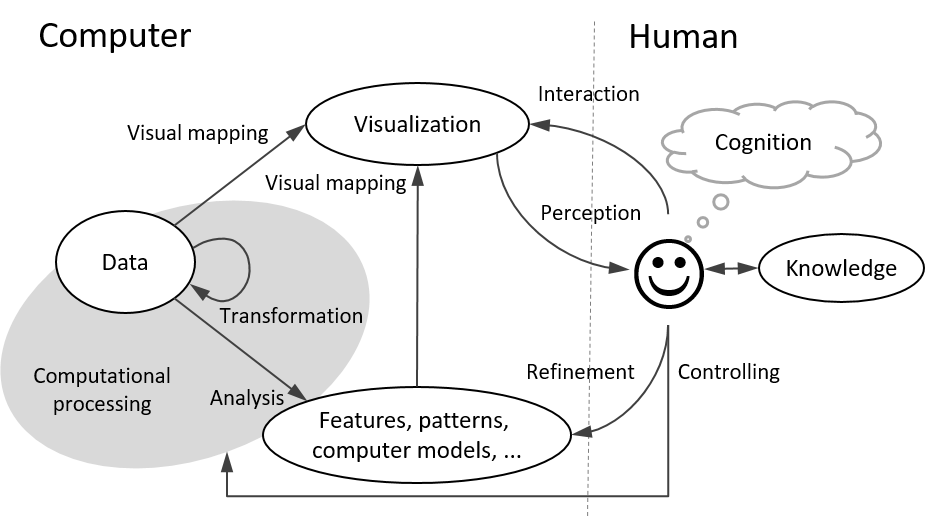


Fig. 1. An example of including a diagram in the document.

## Process

First paragraph...

Following paragraphs...

*<1500 words, <=7 images*

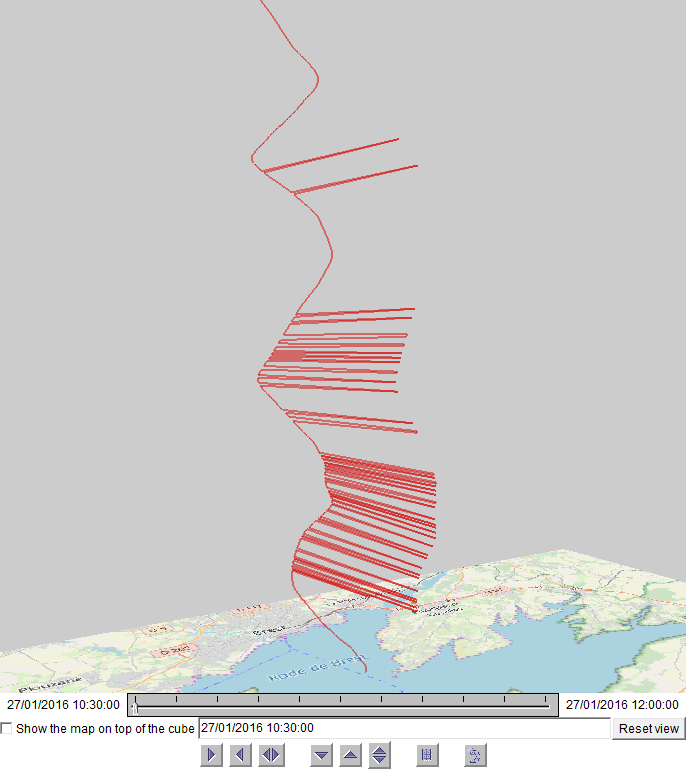


Fig. 2. An example of including a screenshot in the document.

## Results

First paragraph...

Following paragraphs...

*<200 words, <=2 images*

# Critical reflection

First paragraph...

Following paragraphs...

*<500 words*

Table of word counts

|  |  |
| --- | --- |
| Problem statement | 250 |
| State of the art | 500 |
| Properties of the data | 500 |
| Analysis: Approach | 500 |
| Analysis: Process | 1500 |
| Analysis: Results | 200 |
| Critical reflection | 500 |

References

The list below provides examples of formatting references.

1. Office for National Statistics; National Records of Scotland; Northern Ireland Statistics and Research Agency (2017): 2011 Census aggregate data. UK Data Service (Edition: February 2017). DOI: http://dx.doi.org/10.5257/census/aggregate-2011-2
2. Gov.UK Coronavirus. ‘Cases in the UK | Coronavirus in the UK’. HTML, 2021. <https://coronavirus.data.gov.uk/details/cases?areaType=overview&areaName=United%20Kingdom>.
3. Office for National Statistics (2011). 2011 Census: boundary data (England and Wales) [data collection]. UK Data Service. SN:5819 UKBORDERS: Digitised Boundary Data, 1840- and Postcode Directories, 1980-. <http://discover.ukdataservice.ac.uk/catalogue/?sn=5819&type=Data%20catalogue>, Retrieved from <http://census.ukdataservice.ac.uk/get-data/boundary-data.aspx>. Contains public sector information licensed under the Open Government Licence v3.
4. ‘Microsoft Excel Spreadsheet Software | Microsoft 365’. Accessed 30 December 2021. <https://www.microsoft.com/en-us/microsoft-365/excel>.
5. ‘Pandas - Python Data Analysis Library’. Accessed 30 December 2021. <https://pandas.pydata.org/>.
6. Hilton, Joe, and Matt J. Keeling. ‘Estimation of Country-Level Basic Reproductive Ratios for Novel Coronavirus (COVID-19) Using Synthetic Contact Matrices’, 27 February 2020. <https://doi.org/10.1101/2020.02.26.20028167>.
7. Klepac, Petra, Adam J. Kucharski, Andrew JK Conlan, Stephen Kissler, Maria L. Tang, Hannah Fry, and Julia R. Gog. ‘Contacts in Context: Large-Scale Setting-Specific Social Mixing Matrices from the BBC Pandemic Project’, 5 March 2020. <https://doi.org/10.1101/2020.02.16.20023754>.