**MSc Project - Reflective Essay**

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| **Project Title:** | **Investigating the effect of Coronavirus Lockdowns on Crime Rates within the UK** |
| **Student Name:** | **Elliot Linsey** |
| **Student Number:** | **210764484** |
| **Supervisor Name:** | Prof. Norman Fenton |
| **Programme of Study:** | MSc Data Science and AI |

For my MSc project, I used a combination of classical and Bayesian statistical methods to investigate the effect that the coronavirus lockdowns had on crime rates within the UK. During the coronavirus pandemic of 2020 – 2021, radical and sudden changes were introduced to UK society in terms of public mobility. This produced a unique environment in which the usual risk factors such as a perpetrator and victim’s mobility (Farrell et al, 2020) and situational opportunity for a crime to occur (Clarke, 2012) were reduced. I felt this was an interesting topic to explore as the pandemic had recently ended and the aftereffects were still being experienced throughout the country. Papers I had researched on the topic had also only focused on short time periods within the pandemic, such as the immediate period after lockdown was initiated. During my own research more data was available and allowed a full look back on the entire pandemic period. Using classical statistical models allowed investigation into the data that was observed and the associations between variables. The Bayesian causal network was able to implement uncertainty about causes and was used to try and model the true and unobserved crime rates.

Analysis of Strengths and Weaknesses:

The first weakness and strength encountered within my project is related to the data, which was obtained from <https://data.police.uk/>. In general, the problems come down to the level of granularity that the data is looked at with. This data required a fair amount of data cleaning and manipulation and throughout this process some of the information had to be removed, combined or reduced down for the sake of simplicity and resulted in a lower level of granularity (or a more pulled back view). An example of this being the combination of multiple types of theft into one ‘Theft’ variable. This meant that the nuances within this variable type may not be adequately represented or insights may be missed. It may have been found that burglary decreased but bicycle theft increased, however this is not possible to tell and the only conclusion we can draw is about theft as a whole. This problem is also present within the other variables, a particularly area to investigate would have been within ‘Violence and Sexual Offences’. During my research I found many instances of domestic violence increasing. However, due to the structure of the data I was not able to isolate that specific crime sub-type from within ‘Violence and Sexual Offences’ and so I was not able to confirm whether the papers from my independent research were accurate.

The same granularity problem occurs with the ‘Region’ variable, as 40 police constabularies are present in the data but were combined into 5 overall regions. This could also introduce confounding variables due to the difference between urban and rural areas present within each region. It could have been possible to separate the areas into these two variable types and identify differences between them to try and avoid this confounding variable. However, by doing this region could become the confounding variable. For example, is it right to compare a rural area from the North to a rural area in the South East? Would there be regional differences between them? Regardless of the fact both are rural? These types of dilemmas were present throughout the project and had to be weighed up to try and make the best decision. I think that separating the country into 5 regions was the best decision for this particular project, as it provides a good level of view into the crime rates without being overbearing. Using the full 40 police constabularies could have provided more in-depth information, but I wanted to get an overview of the effect of the pandemic on crime rates and did not require that high level of granularity. Also, the data visualisation of 40 area variables would have been an information overload and therefore redundant.

References:

Clarke, R.V. (2012). Opportunity makes the thief. Really? And so what? Crime Sci 1, 3 <https://doi.org/10.1186/2193-7680-1-3> accessed [30/06/22]

Farrell, G., N. Tilley. (2020). Coronavirus: How crime changes during a lockdown. The Conversation, 02 April. [Coronavirus: how crime changes during a lockdown (theconversation.com)](https://theconversation.com/coronavirus-how-crime-changes-during-a-lockdown-134948) accessed [30/06/22]