The Effects of The Covid-19 Pandemic on Environmental Noise

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Abstract:

Environmental noise is an invisible danger. Most don't consider it as a dangerous entity, yet effects of long-term exposure can be drastic. Effects can be can be physical, psychological, behavioural or memory related, with the European Commission estimating in 1996, 20% of the EU population suffered negative impacts to their health due to noise (Harding, Noise and Health, 2013). The COVID-19 pandemic has presented as a potential hamper for noise, due to contributors being reduced. The pandemic, like environmental noise, has affected almost every person on the earth. This study assessed 3 sites in Southampton during and after the national lockdowns, analysing if there has been a measurable effect. A questionnaire was also released, showing 96% of people felt a decrease in environmental noise during the pandemic. Testing found general noise levels were decreased during periods of lockdown. The study displayed the implications of the pandemic on environmental noise, showing what might be a permanent reduction in a harmful source of pollution.

Introduction:

The novel Coronavirus first appeared in Wuhan, China in late 2019. As of 12th March 2020, over 128,674,128 cases and 2,794,610 deaths worldwide have been reported (European Centre for Disease Control and Prevention, 2020). The UK Government implemented a national lockdown in March leading to a 90% reduction in air traffic flights across Europe (Eurocontrol, 2021) and a 70% reduction in the use of cars (Office for National Statistics, 2020). The European Environment agency states road traffic as the largest contributor to noise, with an estimated 75 million people in the EU exposed annually to an average of Lden >55 dB within urban areas, with air and rail traffic closely behind (European Environment Agency, 2019). Southampton is home to the 2nd busiest port in the UK, vast rail and road links and an international airport, hence the reason the area was selected for testing. It's therefore likely the Covid-19 pandemic has influenced the levels of environmental noise in and around Southampton due to major contributors being reduced.

Aims and Objectives:

- Investigate potential effects of the Covid-19 pandemic on environmental noise levels.
- Measure the significance of potential changes in levels.
- Release a survey to evaluate the effects of these changes on the general public.
- Find the key contributors to environmental noise and which contributors have been most heavily impacted by Covid-19.
- Conclude what the changes/effects have been.

Method:

- Data collection- Sound level metres collected LAeq and Lden values at 3 test sites (2x city centre and 1x rural). The data was graphed and analysed. This provided reliable quantitative data to look at noise pollution levels, allowing a contrast at different times e.g., night/day, during lockdown/post lockdown.
- Survery- A google forms survey gained 88 responses, and gave qualitative data assessing the effect felt by people. This allowed subjective views to be collected and decisions on changes in tranquillity before and during the national lockdown.
- Interviews- Allowed participants to share their views on noise itself and the changes over the pandemic. Participants living within close range to the testing sites were selected.

Results:

The collected data indicated mainly a reduction of environmental noise during periods of lockdown. The figures below show this general reduction in LAeq across all 3 test sites. For example a 4dB reduction after lockdown at 1pm for test site 2.

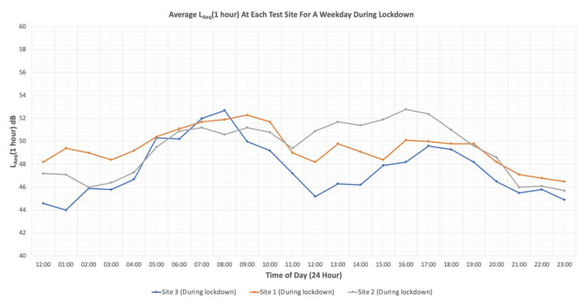

Figure 1 - Graph comparing the average weekday LAeq (1 Hour) during lockdown at each test site

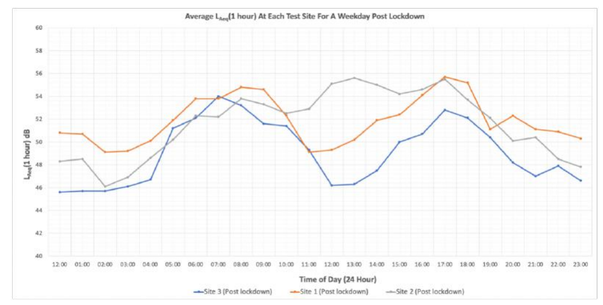

Figure 2 - Graph comparing the average weekday LAeq (1 Hour) after lockdown at each test site

Below shows some qualitative data collected. Figure 3 shows 96% of people felt a decrease of noise during lockdown 1.

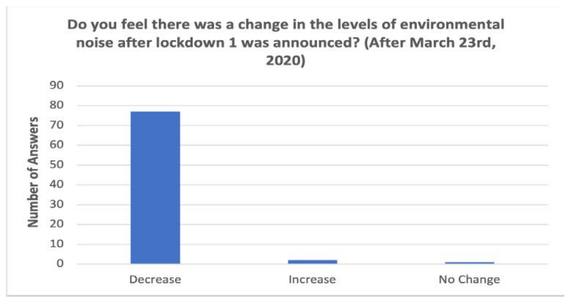

Figure 3 - Graph showing responses when people were asked 'Was there a change in the levels of environmental noise after lockdown 1 was announced? (After March 23rd, 2020)'

Figure 4 - Word cloud showing popular words when people were asked 'Why do you think this is?'.

Conclusions:

The research conducted proved that there were several effects on environmental noise during the COVID-19 pandemic, mainly with a resounding reduction proved by both the measured data's findings and the answers from the questionnaire. The overall project was therefore successful in the answering of the research question. The project also stuck within the planned schedule and time frame.

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