

## Original Article

**Impact of Automobile Emission on Public during and After Covid****Muhammad Waseem<sup>1</sup>, Muhammad Azeem<sup>2</sup>, Muhammad Asif<sup>3</sup>**

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**Abstract:**

**Introduction:** COVID-19 being a burning issue took itself to spotlight earlier in 2020 causing severe respiratory infections with symptoms like high fever, dry cough, loss of taste and fatigue. WHO declared it a pandemic due to its rapid and worldwide transmission. The government of many countries put their cities to lockdown since February 2020 to minimize the spread of the disease. From easing the lockdown in staggered manner to wearing masks as an obligatory part of daily life, transport reduction was another important step in the minimization process.

**Methodology:** This study was conducted to observe the impacts of automobile emissions on the environment and public health. These emissions contain many oxides of carbon, nitrogen, sulfur, etc that pollutes the air (smog production) and cause many health issues for example respiratory illnesses, skin allergies, irritation in the eyes, etc. During lockdown, less traffic was observed on the roads and ultimately resulted in reduced pollution.

**Results:** To analyze this reduction, people were asked through a questionnaire to give their opinion about the change in environmental conditions during pandemic lockdown (started in April 2020 In Pakistan). According to the survey report, air quality improved during lockdown because of less fuel combustion in running automobiles and industrial sector. Another study reported a 25% drop in emissions of harmful gases in the environment.

**Conclusion:** Many people in the survey study agreed that the lockdown has put a positive impact on the environment and health such as increased greenery, fewer allergic reactions, less smog and less respiratory illnesses were observed.

**Key words:** Emission, Pollution, Covid, Bacteria, Virus

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## Introduction:

Due to automotive development, automobiles entered a new revolutionary era and their availability led to huge traffic loads causing unnecessary emissions. From Automobile emissions the fumes, gases, vapors, and odor given off after the engine has burned the gasoline in the course of operating the vehicle which consist up of carbon monoxide, nitrogen oxides, un-burnt gasoline, carbon dioxide, and lead sometimes. Poor air quality increases respiratory ailments like asthma, bronchitis and the new study shows that the COVID-19 is worsening because air pollution is collapsing the health care system with substantial medical costs. Particulate matter is single-handedly responsible for up to 30,000 premature deaths each year (Rao, A. S. 2020).

Public vehicles are a major pollution contributor. In 2013, transportation contributed more than half of the carbon monoxide, nitrogen oxides, and almost a quarter of the hydrocarbons into the air. Car exhausts emit a wide range of gases and solid matter, causing global warming, acid rain, and ozone layer depletion. Engine noise and fuel spills also play a part. Cars and trucks emit carbon dioxide and other greenhouse gases which trap heat in the atmosphere, causing worldwide temperatures to rise, an increase of 0.6 degrees Celsius, or 1 °F in global temperatures since pre-industrial times has been observed and is assumed to rise over the coming decades. Warmer global temperatures affect farming, wildlife, sea levels, and natural landscapes (Davies *et al.*, 2009).

Diesel engines emit high levels of particulate matter i.e. airborne particles of soot and metal. These particles cause skin and eye irritation and allergies, lodging fine

particles deep into the lungs where they cause breathing difficulties. Epidemiological studies have demonstrated an association between different levels of air pollution and various health outcomes including mortality, exacerbation of asthma, chronic bronchitis, respiratory tract infections, ischaemic heart diseases, and stroke (Sydbomet *al.*, 2001). Unfortunately, the burden of pollution is not equally shared and the low-income community suffers the most, therefore mortality rates due to Covid-19 are higher in these areas compared to the upper class. People are more susceptible to Covid-19 due to air pollution (Kaiser, J. 2005).

Exposure plays a key role in this situation and the fall of the economy as a result of this pandemic has led to a clear collapse of health and more deaths due to lack of proper treatment.

Another research study suggests that emissions decline is less than what was expected and a rebound after the pandemic is on the way, so masks should be a new normal to avoid inhalation of particulate matter (Urrutia Pereira *et al.*, 2020).

### Objectives of the study:

- Highlighting the effects of automobile emissions on the environment and living organisms.
- Comparing the air quality and change in people's lifestyle during the pandemic.
- Reporting the common health problems and contribution of these emissions to air pollution.

### Methodology:

#### Research design:

Descriptive statistical analysis design was used in this study research to find out the relationship between lockdown and improved air quality.

A purposive sampling technique was used to collect data. Sample size was 527

including 191 males and 336 females. The data was collected from different areas of Lahore.

#### **Inclusion criteria:**

Youngsters and adults were included in the study with age range of 10 to >65 years.

#### **Questionnaire:**

A questionnaire was prepared to calculate the “impact of automobile emissions on the environment as well as the difference in climate condition before and after COVID-19 pandemic lockdown.” The question paper was approved by the supervisor in the Department of Microbiology & Molecular Genetics; University of the Punjab, Lahore and the survey was conducted under the supervision of teachers.

Different criteria were included in the questionnaire such as vehicle type (car, bus, motor bike), fuel type (petrol, CNG, diesel), maintenance of vehicle (monthly, annually), smoke production and its effects on human health and environment. Only road traffic vehicles in the respective city area were included in this survey, the air traffic and train traffic was not part of this survey.

#### **The procedure of data collection:**

The researchers identified the inclusion and exclusion criteria and insured to maintain the confidentiality of all the information collected. The aim of the research was also explained to the participants. The participants were provided questionnaire related to automobile usage and their impacts on the health and the environment as well as the difference in climate condition before and after the COVID-19 pandemic lockdown. All collected data was used to estimate the oil and fuel contribution to human health and the environment

#### **Results:**

#### **Exclusion criteria:**

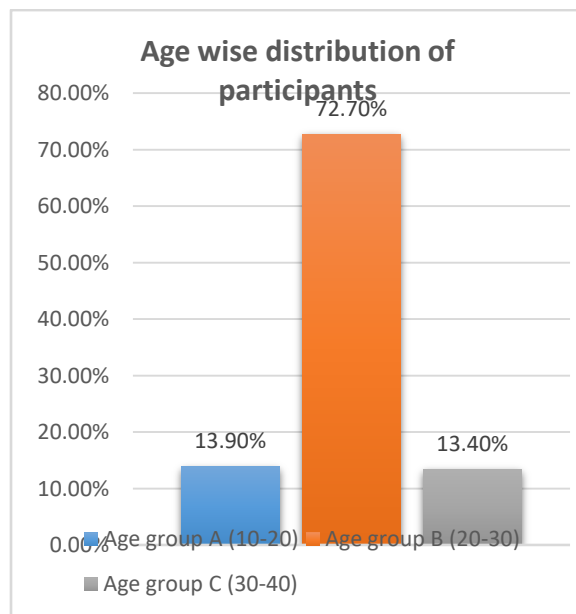
Children category was excluded.

#### **Measures:**

The assessment measures that were used in this research include demographic information sheet having age, gender, living area, education etc

#### **Demographic analysis:**

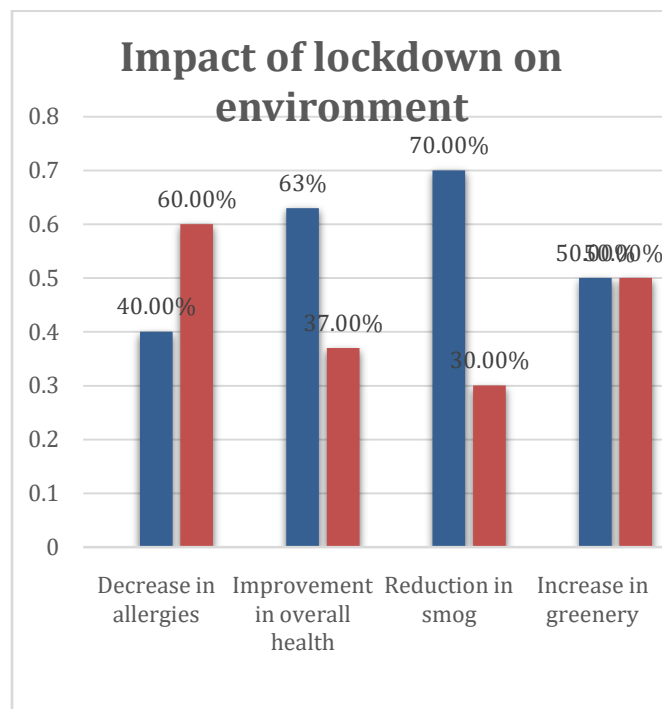
A total of 527 participants took part in the current study of which 191 (36.2%) were males while 336 (63.8%) were females. Most of the participants had outdoor jobs 317 (60.2%) while 210 (39.8%) had indoor jobs. Three age groups were made, most of the participants belong to age group B (20-30 years) 383 (72.7%) followed by age group A (10-20 years) as shown in Figure 1. Most of the participants 357 (67.7%) were from urban areas.



**Figure 1:** Age-wise distribution of participants in the current study.

About 90% of the responders were using petrol and diesel-based automobile while unfortunately only 10% of the participants had hybrid cars. And about 50% of the responders were aware of the hazards caused by automobile emissions and were tuning up their automobiles on monthly basis. Over 65% of the responders considered the public responsible to follow the necessary precautions to overcome the environmental pollution while 61% of responders blamed the authorities. This indicates that the people in the studied area are aware of their responsibilities. According to 60% of responders, less traffic was seen on the road due to which a significant decrease in smog and haze was noted, as reported by 70% of responders. About 40% of the participants were allergic to automobile emissions and they had observed a significant decrease in allergies like eye irritation and skin allergy etc after the lockdown. About 50% of responders noted the increase in greenery at the end of the lockdown this indicates that automobile emission has an impact on the plants. A significant improvement in overall health

and fitness can be noticed at the end of lockdown due to less pollution as reported by 63% of responders.



**Figure 2:** Showing the impact of lockdown on the environment:

**Table #1: Response of participants:**

Questions	Responses	Percentage
Use petrol-based vehicles	474	90%
Use hybrid vehicles	53	10%
Monthly tuning of vehicles	264	50%
Public is responsible for environmental pollution	342	65%
Authority is responsible for environmental pollution	322	61%
Less traffic was seen during lockdown	316	60%
Decrease in smog and haze after lockdown	369	70%

Allergic to smoke	211	40%
Decrease in allergies at the end of lockdown	211	40%
Increase in greenery at the end of lockdown	266	50%
Improvement in overall health after the Lockdown	332	63%

### Discussion:

The study was conducted to see the impacts of reduced traffic on the environment during the lockdown. The survey was conducted in different areas of Pakistan. Based on a questionnaire given to the public, results were analyzed and concluded to see the impacts of limited automobile emissions on the environment during the lockdown. Strict rules given by the government of Pakistan during lockdown have resulted in improved air quality. Recently, overpopulation and automobile emissions resulted in a decline in air quality (Invernizziet *al.*, 2011; Lahdeet *al.*, 2014), due to a rise in human activities, which create polluting discharges (Voiculescuet *al.*, 2020).

The 'livability' of both cities and human health is affected by poor air quality. World Health Organization has estimated in 2016 that 91% of the world's population was not following the air quality guidelines given by WHO (World Health Organization 2016). In urban areas road traffic has been considered as one of the main causes of air contamination and pollution (Lahde et al. 2014; World Health Organization 2016). It has been estimated in Europe in 2017, that almost 25% of greenhouse gas discharges were produced by the transport sector (Maioneet *al.* 2021). Positive correlations

were observed by many authors between nitrogen oxides and traffic volumes, such as NO (AgudeloCoCastanedaet *al.*, 2014; Lahdeet *al.*, 2014; Rossi *et al.*, 2020), NO<sub>x</sub>, and NO<sub>2</sub> (AgudeloCoCastanedaet *al.*, 2014; Lahdeet *al.*, 2014; Rossi *et al.*, 2020; Wang *et al.*, 2020).

This survey-based study was planned to recognize the impacts of automobiles emission on the environment and human health. The results showed a clear decrease in environmental pollution during lockdown which led to a subsequent decrease in health-related issues such as allergies and asthma. A significant decrease in the smog was noticed according to a questionnaire filled by the public of remote areas. An increase in greenery was observed. Results were following the literature. 40 percent of people claimed a decrease in allergies, 50 percent of people claimed an increase in environmental greenery and 63 percent of people claimed improvement in overall physical health. The results were under literature studies, showing a very positive impact of lockdown on the environment, on overall public health, and air quality.

### Suggestions:

The study proved the automobile emissions to be one of the major cause of environmental pollution and public health hazards. Small effective efforts like planting

more trees, promoting online shopping for grocery and daily use items, use of public transport, walking if convenient, reduced idling, introducing alternative services like electric cars or hybrid cars, regular maintenance of vehicles, awareness programs and a sense of responsibility can definitely play part in minimizing the pollution. .

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