

Air Quality around Primary Schools in Coventry

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Background

The global improvement in air quality remains a major World Health Organization goal [1]. Though its effect on adults is considerable, it is children that can suffer the worst from exposure to unsafe air. It is estimated that 93% of all children live in areas that exceed WHO guidelines on exposure limits for children. Though, this effects mostly middle and lower income countries, it remains a significant issue in the UK. It is estimated by 71% of all UK towns and cities have air pollution levels that are toxic to children.

Air pollution is generated from a wide range of sources including transport, energy production, industrial processes, household process (such as wood burners) and agriculture. These produce a spectrum of pollutants, but are dominated by particulate matter (PM) and inorganic gases, such as nitrogen dioxide and sulphur dioxide.

Their effect of children is considerable and can lead to a broad range of conditions. In pregnancy, air pollution results in low birth weight and premature birth. In childhood, most conditions are related to the lungs, causing stunted development, reduced lung function, asthma and repeated respiratory function. In addition, poor air has also been linked to mental impairment and behavioural problems. Once arriving in adulthood, these children have a much greater risk of heart disease, diabetes and stroke. Therefore, air quality is seen as a global and national emergency.

Project Description

This project has been initiated by a councillor in Coventry, local residents and schools in the south Coventry area. A common complaint of schools, local residence and parents is the issue of traffic congestion on the drop off and pick-up at either end of the school day. There are major concerns from all stakeholders is that the excessive traffic is leading to poor air quality around the school, where children are breathing in this air as they arrive and leave school and in the school grounds in the morning period. The overall goal of this work is to educate parents of the issue of air pollution around the school and the affect it is having on their children. With this evidence and with a promotion approach, it is hoped that parents decide to take alternative forms of transport to school and ideally walking. In addition, we will approach Coventry Council to potential add traffic control measures to the local area.

Project Aim

The aim of the project is to measure the most common outdoor air pollution components throughout a school day and compare them with WHO and government legislation on exposure limits.

Project progress

As part of previous activities, we developed an outdoor air monitoring system, named "FRESH". These are complete self-contained systems that measure the main air pollutants, including NO₂, NO, SO₂, O₃, PM1, PM2.5, PM10, VOC (volatile organic compounds) as well as measures of environmental quality, temperature, humidity, sound, ambient light and UV light. The unit is battery powered and can be charged/supplied from a solar panel. This system has already been used to measure environmental quality at different locations around the University campus.

These units have been updated with some replacement sensors – these have a finite lifespan, new batteries and a new mounting system. The original units were designed to be mounted on lamp posts, however, it was decided this increased the risk for children and so a new stand was designed and manufactured that allows the unit to be free standing. We have also visited three local primary schools that have agreed to support the project and site visits have occurred to identify prime locations for the monitors that are on the school site, near the entrances and safe for the children. We have also undertaken some initial measurements. Our next stages are to undertake 2-3 months of testing with each site to measure the pollution levels, which will be provided to the team, the schools and Coventry council.

1. https://www.who.int/health-topics/air-pollution#tab=tab_1