

The King's College London HEI project – Health, Environment and Innovation

Reducing air pollution in London, combating cardio-respiratory illness, stimulating innovation

Reason for entering

Origins & partners

London suffers with the worst air pollution in the UK and some of poorest in Europe. Poor air quality worsens asthma and causes premature death in up to 3000 Londoners each year. A Ipsos Mori poll found that 72% of Londoners are worried about pollution from traffic exhaust fumes. To address the problem Transport for London (TfL) was tasked to develop plans to reduce harmful traffic emissions. Given the King's College London's experience and understanding of air quality issues in London TfL approached King's Environmental Research Group (ERG) for advice. ERG works closely with King's innovation office (King's Business) in particular through support for its consultancy arrangements with partners and in the development of applied research proposals.

Achievement

Recognising that a Low Emission Zone (LEZ) is the most effective way of quickly reducing pollutants that are amongst the most harmful to human health, ERG played a critical role in the planning and design of the Capital's LEZ, which came into operation in 2008. The London LEZ is the largest in the world and is designed to improve air quality in the city by deterring the most polluting vehicles from driving in the Greater London area. This will improve the health and quality of life of people who live in, work in and visit London, especially those suffering from respiratory or cardiovascular illnesses.

Impact

Through computer modelling of hundreds of potential scenarios at King's, TfL was able to choose the optimal implementation area and vehicle restrictions for the LEZ. The work has had a direct impact on the design of road transport policy in London and maximises the delivery of air-quality improvements. Based on ERG's scenarios, TfL estimates that road traffic-related emissions of pollutants will decrease by 6.6 per cent by 2012. Crucially this includes reduction in PM10, (particles with a diameter less than 10 microns) thought to be amongst the most harmful to human health and which correlates with the highest rates of both hospital admission and death due to respiratory and cardiac disease.

Outcomes

To evaluate the impact of the LEZ, the ERG also advised TfL on placement of monitors to detect changes in London's air pollution levels. Having won the contract to operate the LEZ monitoring network, King's ERG recently provided TfL with a report on the first year of the scheme's operation. Importantly, particle and black carbon concentrations have been found to be decreasing in the vicinity of major roads which have high volumes of heavy duty lorries and coaches.

Effect

The work of the ERG has had a transformative effect on the research undertaken at King's College London. It has informed the scientific direction of the unit which has resulted in the creation of the MRC-HPA Centre for Environment and Health which will investigate the damage that our modern living and working environment could be doing to our health. Head of the team, Professor Frank Kelly, actively encourages younger researchers to engage with industry and the public sector and has led by example.

Additional Information

The virtuous cycle of research, innovation and impact

Delivering real and lasting impact takes time, relies on partnership and paves the way for future meaningful innovations.

The project is an exemplar of how knowledge transfer is an additive and longitudinal process. It builds upon ongoing KT programmes such as the London Air Quality Network (LAQN), established in 1993 and run by King's ERG in partnership with local government and the health authorities. The LAQN is the largest regional air quality monitoring network in Europe and is the primary source of air pollution information in London and south east England (www.londonair.org.uk). Through building experience and a demonstrable track record in partnership and delivery and through excellence in research, King's ERG was the partner of choice for TfL to deliver its ambitions to make London a healthier city.

The work undertaken on the project has direct impact on the research undertaken at King's:

An ongoing project is the EXHALE programme (Exploration of Health and Lungs in the Environment) in which Professor Kelly's team are studying children from east London, where one in five has a diagnosis of asthma. To examine the health benefits of the LEZ the team is monitoring children from 20 primary schools close to main roads in Tower Hamlets. Knowledge exchange based on results from the LEZ monitoring programme and the Children's EXHALE study should together help shape future policy decisions regarding transport and schools sites within the UK. King's Business played an instrumental role in establishing this project working in partnership with the academics.

A new programme has been developed and funded through a prestigious MRC Centre award that will enhance understanding of the environment and health and will lead to better interventions and improved healthcare. The research undertaken by the new research Centre will focus particularly on vulnerable people, including children and the elderly, and how environmental factors outside their control could be increasing their risk of respiratory problems, heart disease and cancer.