

Smart city technology and public health

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Abstract

This scoping review summarises the current literature on the intersection between smart city technologies and public health. We investigate examples of smart city infrastructure and technologies that have been used around the world, to improve public health outcomes with respect to both communicable and noncommunicable diseases. For example, smart city surveillance systems to monitor cases of illness in the population have been key in halting spread of diseases such as malaria, and more recently Covid-19. In particular, smart city technologies have been effectively utilised to mitigate the health burdens of traffic-related air pollution (predominantly respiratory disease), as well as water pollution (such as infectious diseases or heavy metal contamination). We note significant ambiguity around the definition of a smart city which posed a challenge when measuring health outcomes of such technologies.

We also outline numerous challenges that arise as a consequence of smart city technologies being used for the purpose of ameliorating public health. In large part these pertain to concerns surrounding privacy of individuals and security of population data, due to the use of continuous health monitoring and surveillance technology. For example, there is ambiguity in data processing regulatory frameworks in the USA, which creates loopholes allowing for the unregulated collection and use of personal health data, with potentially detrimental consequences on the population's privacy. There is also a distinct lack of interoperability between different smart cities, as well as inequity in the distribution of these technologies both within and between countries, which limits their utility.

Finally, we provide policy recommendations for how smart city technologies should be implemented in the future to address these challenges. Suggestions include the use of decentralised structures of information systems; robust regulatory frameworks for the technology companies involved in the infrastructure; and engagement of stakeholders at all stages of development of smart cities. This paper builds on existing literature which outlines the public health benefits of smart city technology, by addressing in depth the associated challenges, as well as proposing solutions for policymakers to address these challenges.