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Environmental Epidemiology in a Globalizing Environment Changes

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Abstract

In 2001, Pekkanen and Pearce outlined the fundamental difficulties facing environmental epidemiology. These included the need for new methodologies and interdisciplinary to study connections between global environmental change and health, complex mixtures of a large number of correlated exposures, small effect sizes that can result in studies that are inconclusive in the context of residual confounding. They also cautioned against letting the importance of public health influence research topics in favour of new technology. The exact measurement of exposures in space and time, together with these remarkable advancements in statistical methods to derive valuable information on mixtures of correlated exposures, continue to be some of the major problems in the area today. The availability of data and the quick rate of technological advancement have made the Prioritizing what must be done over what may be done is more urgently needed to maximise public health benefits.

Keywords: Environment; Epidemiology; Demographics; Urbanization

Introduction

In Part I of this essay, we identify the major trends that will influence environmental epidemiology during the next 25 years, a period that roughly corresponds to the majority of the authors' professional lives. In, we make recommendations for how the field might use these factors to enhance population environmental health. We offer specific suggestions for how to adapt new paradigms, measurement techniques, and analytical methods. We emphasise the future scenarios that we think are best for attaining public health objectives.

Demographics and Urbanization

The shifting demographics of the world's population, including changes in age and regional distribution, will continue to alter the priorities for environmental health research within the larger framework of the epidemiologic transition and economic development. Life expectancy has increased globally, with significant advances in low-income nations, where it rose from 53 years in 1990 to 62 years in 2012. In 1940, those 60 and older made up 8% of the world's population; this number increased to 12% by 2013; and is expected to reach 21% by 2050. Public health initiatives have contributed to this enormous change in the age distribution globally, but it also creates new health issues. Additionally, there will be noticeable changes in how people are distributed geographically around the world [1]. between now and now, much of the population growth More than half of the anticipated expansion will occur in just nine countries, all of which have high fertility rates or already huge populations by 2050. Between now and 2050, the percentage of the world's population residing in Africa will rise from 16% to 25%, while the percentage in Europe will decline from 10% to 7%. The 48 least developed nations are expected to continue to experience particularly significant population growth, which will make it more difficult to achieve the goals of sustainable development. In many of the nations with the fastest population growth, there is currently a dearth of information on environmental exposures and their impact on health [2]. Due to variances, the effects of environmental exposures may not be the same as those seen in high-income countries, where the majority of environmental health research has been done. in the prevalence of infectious diseases, access to healthcare, and material deprivation Large-scale migration will complicate environmental epidemiology even more and make it difficult to monitor study participants and measure environmental exposure. Based on their migration history, people who live in places with comparable amounts of environmental exposure may have substantially varying cumulative exposure. High levels of environmental exposures in early life, exposures that may be particularly challenging to recreate, may have an impact on adult health for migrants from societies with weaker regulations to societies with stronger regulations. Another benefit of migration may be the chance to conduct natural experiments to better understand how the environment affects health [3]. The population of the world is still moving from rural to urban places. By 2050, 66% of people are expected to live in urban settings, up from 54% in 2014. Almost 90% of the anticipated rise in the global population is India, China, and Nigeria will account for a significant portion of this expansion in the urban population, which will be concentrated in Asia and Africa. Urbanization has a significant impact on environmental exposures, behaviour, and illness risk.

Global Environmental Change

Much of the future context for environmental epidemiology will be defined by climate change and increasing environmental concerns. The "greatest worldwide health danger of the 21st century" is said to be climate change. According to the IPCC (2013), the mean surface temperature will rise by 0.3 to 4.8 °C by 2100, which will have a direct negative impact on health due to heat stress and flooding as well as indirect negative health effects mediated by infectious illnesses, air quality, and food security [4]. The numerous possible negative effects of climate change on health have been explored in recent papers. The Intergovernmental Panel on Climate Change predicts an increase in both the frequency and intensity of heat waves under all climate scenarios, which is solid evidence that heat-related mortality is growing as a result of climate change. The overall result growing number of elderly people who are susceptible to heat stress will be exposed by the combined effects of global warming and demographic change.

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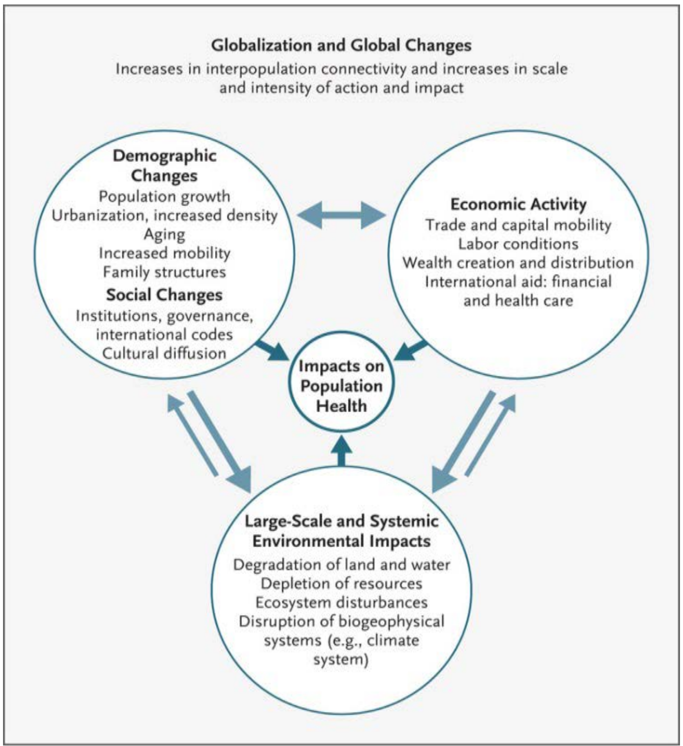

Figure 1: Environmental Epidemiology in a Globalizing Environment Changes.

If no adaptation measures are done, the health effects of extreme weather events like storms and floods are predicted to worsen this century. Additionally, it is predicted that climate change will increase the likelihood of severe droughts in some areas, which would reduce agricultural productivity and, as a result, worsen food insecurity and malnutrition. Undoubtedly one of the biggest threats to food security is climate change [5]. Droughts also increase the risks of mental illness, water-associated disease, vector-borne disease, airborne disease, and disease related to dust such coccidioidomycosis. Climate (change) may play a significant role in the dynamics of vector-borne illness transmission, such as Lyme disease, dengue fever, and malaria. Climate change appears to be modifying the geographic range of vectors that transmit infections to humans, along with changes in land use. Chemical exposures will continue to be a major issue for environmental health. In 2000, chemical production was 1000 times more than it was in 1930. Although the amount of chemicals produced does not directly correlate with population exposure, it is anticipated that over the next few decades, exposure to chemicals will continue to rise [6]. Those with short half-lives in the body, which are now favoured to those with lengthy half-lives for environmental and health reasons but which cause exposure misclassification in conventional studies that rely on spot biomarkers, are of special concern.

Technology

Environmental exposure and health consequence assessment applications of technology are developing quickly. New opportunities will be created by technology, particularly in the areas of demographic datasets, m- and e-health, remote and personal sensor technology, and OMICs data. The emerging technologies that could be used in environmental epidemiology are highlighted below [7]. Increasing data accessibility will enable forecasting of various population exposures and open up new possibilities for investigating novel exposures that have hitherto been challenging to quantify. Importantly, the availability of geo-referenced data is expanding, which lowers the obstacles to doing environmental epidemiology in low- and middle-income nations. These data come from remote sensing, sensor networks, smartphones, and the "internet of things," among other sources (i.e., everyday objects with network connectivity). Air pollution, green space, and temperature exposures have all been estimated using remote sensing. With more satellites in orbit and better detection resolution, opportunities for satellite-based exposure assessment will keep growing. Applying advances in image processing to resources like Google Street View and to ecological momentary assessment based on people snapping photos of their immediate surroundings with their cell phones will improve quantifying neighbourhood features. Improving measurements of other exposures, such as nutrition, drug, or cosmetic usage, for which research participants can snap photos of what they consume or use, or scan bar codes [8]. Utilizing miniature cameras or virtual reality, it will be simple to examine a new exposure pathway visual exposure to see how people internalize and engage with their surroundings. For instance, this technology will make it possible to identify whether people are visually exposed to green space and which areas of the world they are most likely to visit. The activities they carry out in the green area. More and more social media data will be used to evaluate behaviours, exposures, and results. The identification of symptoms, behavioural risk factors, and population migration patterns has all been accomplished using these methods [9].

Environmental epidemiology is experiencing enormous opportunity as e/m-health and new personal sensor technologies grow. Mobile platforms are becoming more and more useful for recruiting participants, gathering survey data, reviewing results, and incorporating medical health information. This will be the primary method for recruiting cohorts (NIH, 2016). The quantified self-movement further advances the usage of e/m-health. When low-cost sensors for environmental exposures improve in terms of data quality and continue to shrink in size and cost, the sorts and sizes of data that may be available may be foreshadowed by the increasing acceptance of current smart phones and sensors. Numerous biological data, such as participants' physical activity, sleep, heart rate, and, to a lesser extent, blood pressure, may now be recorded in real time using affordable wearable technology. With minimum strain on the athlete. These monitors will make it possible for researchers to track exposures and health impacts on a broader scale [10]. Sensors are anticipated to be widely employed by people outside of research environments as their price falls. Manufacturers of smartphones will also understand the commercial benefits of differentiating their products by including sensor packages.

Conclussion

New sensors will dramatically transform how we measure environmental exposure and health outcomes in 25 years. These sensors will assess additional variables and provide participants with ongoing feedback, which has significant implications for the design of observational studies [11]. Through broad 3D printing capabilities, new sensors will also be readily available, redefining the idea of citizen research. The "internet of things," which connects and makes available a variety of data sources, will be a major influence on how exposure assessment is conducted. Smart sensors will become more common in homes, street furniture, and automobiles to monitor environmental factors including air pollution, asthma triggers, noise, etc [12]. Continuous data streams will be provided by smart cities, and crowdsourcing of individual sensor measurements will be incorporated into these environmental measurements.

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Conflict of Interest

None

References

1. Pimentel D (1991) Global warming, population growth and natural resources for food production. Soc Nat Resour 4:347-63
2. Graber DR, Jones WJ, Johnson JA (1995) Human and ecosystem health: the environment-agriculture connection in developing countries. J Agromedicine 2:47-64.
3. Falkenmark M, Widstrand C (1992) Population and water resources: a delicate balance. Popul Bull 47(3):1-36.
4. Barrett B, Charles JW, Temte JL (2015) Climate change, human health, and epidemiological transition. Prev Med 70:69-75.
5. McMichael AJ (2001) Impact of climatic and other environmental changes on food production and population health in the coming decades. Proc Nutr Soc 60:195-201.
6. Morris GP, Reis S, Beck SA, Fleming LE, Adger WN, et al (2017)Scoping the proximal and distal dimensions of climate change on health and wellbeing. Environ Health 16(Suppl 1):116.
7. Ali M, Hidayatullah TA, Alimuddin Z, Sabrina Y (2013) Sequence Diversity of pfmdr1 and Sequence Conserve of pldh in Plasmodium falciparum from Indonesia: Its implications on Designing a Novel Antimalarial Drug with Less Prone to Resistance. Iran J Parasitol 8:522-9.
8. Semenza JC, Houser C, Herbst S, Rechenburg A, Suk JE, et al (2012) Knowledge Mapping for Climate Change and Food- and Waterborne Diseases. Crit Rev Environ Sci Technol 42:378-411.
9. Gupta S (2012) Profile of Anthony J. McMichael. Proc Natl Acad Sci 109:6787-6799.
10. Martin SL, Cakmak S, Hebbern CA, Avramescu ML, Tremblay N (2012) Climate change and future temperature-related mortality in 15 Canadian cities. Int J Biometeorol 56:605-19.
11. Cohen JE (2010) Population and climate change. Proc Am Philos Soc 154:158-82.
12. Heywood VH (2011) Ethnopharmacology, food production, nutrition and biodiversity conservation: towards a sustainable future for indigenous peoples. J Ethnopharmacology 137:1-15.