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EDITORIAL

Explaining health inequalities: the role of space and time

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The role of individual and contextual factors

Inequalities in health are growing throughout Europe. This has created much concern among public health researchers and instigated numerous studies. And yet, the underlying mechanisms which mediate the association between socio-economic disadvantage and health are not fully understood. Individual risk factors such as smoking or a low socio-economic status and their effect on health have been examined in considerable detail, and explanatory models describing pathways and associations have been proposed. Our own previous work has shown that existing explanatory models often fail to acknowledge the role of "space", by which we mean contextual variables located at the level of regions, counties and neighbourhoods, as compared to factors at individual level (Razum et al. 2008). In addition, they put very little emphasis on "time", i.e., the temporal dimension of the association of contextual factors and health (Voigtländer et al. 2012, 2014; Richter and Blane 2013).

The aspects of "space" and "time" as well as the need to improve existing explanatory models of their association with health thus continue to captivate researchers. This special issue of IJPH reflects selected results of the interdisciplinary workshop "Explaining Health Inequalities: The Role of Space and Time" held in June 2012 at the Centre for Interdisciplinary Research (ZiF) at Bielefeld University, Germany. The workshop brought together over 30 researchers from France, Great Britain, Netherlands, Sweden, Austria and Germany, covering the fields of geography, statistics, epidemiology, demography and sociology. They discussed theoretical models on place, space and health, statistical methods, as well as empirical findings of research on spatial determinants of health and their policy implications.

From theory to intervention

Three examples of research deriving from the workshop are presented in this issue of the journal. They reflect the aspects of theory, empirical findings, and interventions.

Voigtländer et al. (2014) reviewed existing explanatory models of small-area effects on health and point to several limitations that require more research. Almost all of the models they found were based on a three-tier structure of micro-, meso- and macro-level, broadly reflecting the levels from individual to society. No study explicitly defined the geographical borders of the small-area context. The health impact of the small-area characteristics was usually explained by specific pathways involving mediating factors (psychological, behavioural, and biological). These

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pathways tended to be seen as uni-directional; often, causality was implied.

Kibele (2013) examined whether regional conditions play a role in health inequalities in Germany. It is known that there are socioeconomic differentials in mortality. Kibele could demonstrate that in addition, there are district-level factors which contribute to the explanation of mortality inequalities, at least in (western) Germany. The more deprived a district is, the higher the mortality and mortality inequalities tend to be.

Interventions to reduce regional differentials in health have ethical implications, as Stapleton et al. (2013) showed. They used the example of placing primary care physicians to underserved areas, depending upon levels of incentive or coercion, to alleviate regional differences in primary care.

Where do we go from here?

Substantial work has been done which helps to better understand the association between contextual variables and health outcomes, as the review by Voigtländer et al. (2014) in this issue of the journal shows. And yet, open questions and methodological challenges remain. As Voigtländer et al. (2014) point out, the geographical definition of what constitutes a small-area context is often determined by pragmatic considerations, namely availability of data. Routine data tend to be aggregated at much higher levels than would be desirable from a methodological point of view. Secondly, only few studies have managed to disentangle small-area effects from selective population movement effects (Reiss et al. 2012). Thirdly, questions of the direction of association will remain as long as much of the published empirical work is cross-sectional. The German National Cohort which will start recruiting participants this year will offer ample opportunity to assess contextual effects longitudinally and thus establish whether observed associations are causal. In the long run, the National Cohort will also offer the means to integrate a time dimension into research on contextual effects on health. For example, it will provide data that allow to model small-area characteristics as time-dependent variables and thus consider relocations to more or less exposed environments during the life-course. The Swiss National Cohort also contains information on place of residence, albeit fewer health-related data (Spoerri et al. 2010). Fourthly, empirical analyses of these complex data require adequate statistical modelling taking spatial and temporal dependencies of the data into account. Fifthly, pathways comprising small-area contextual as well as compositional factors need to be systematically described based on (further) empirical evidence. Finally, interventions need to be developed and evaluated that ameliorate negative health effects of contextual variables.

In summary, the workshop demonstrated that cooperation between different disciplines is essential to analyze, and ultimately to reduce, inequalities in health. To achieve this goal, theoretical models of health inequalities need to be further developed in the light of new empirical findings; to strengthen the empirical side, advanced statistical and geographical methods need to be applied (Voigtländer et al. 2014). To facilitate implementation of effective interventions, health policy stakeholders need to intensify communication with public health researchers. Exciting challenges remain, so researchers should feel encouraged to continue pursuing the research field of small-area and, more generally, contextual effects on health.

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