Original article

Associations between disability prevalence and local-area characteristics in a general community-living population

Prévalence des handicaps et caractéristiques des milieux de vie en population générale vivant à domicile

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Abstract

Background. – Disability is understood to arise from person-environment interactions. Hence, heterogeneity in local-area characteristics should be associated with local-area variation in disability prevalence. This study evaluated the associations of disability prevalence with local-area socioeconomic status and contextual features.

Methods. – Disability prevalence was obtained from the Canada census of 2001 for the entire province of Québec at the level of dissemination areas (617 individuals on average) based on responses from 20% of the population. Data on local-area characteristics were urban-rural denomination, social and material deprivation, active and collective commuting, residential stability, and housing quality. Associations between local-area characteristics and disability prevalence were assessed using multilevel logistic regressions.

Results. – Disability was associated with local-area socioeconomic status and contextual characteristics, and heterogeneity in these factors accounted for urban-rural differences in disability prevalence. Associations between contextual features and disability prevalence were confounded by local-area socioeconomic status. Some associations between local-area socioeconomic status and disability prevalence were moderated by contextual characteristics. The importance of this effect modification is greater when expressed in terms of the absolute magnitude of disability than in the relative likelihood of disability.

Conclusion. – Explanation of rural-urban differences by the contribution of other local-area characteristics is consistent with the conceptualization of urban-rural categories as the reflection of spatially varying ensembles of compositional and contextual factors. Although local-area socioeconomic status explains most variability in disability prevalence, this study shows that contextual characteristics are relevant to analyses of the spatial patterning of disability as they predict spatial variations of disability, sometimes in interaction with socioeconomic status. This study demonstrates that absolute and relative perspectives on effect modification may lead to differing conclusions.

Résumé

Position du problème. – Le handicap est déterminé par des interactions entre les caractéristiques des personnes et celles de l'environnement. Ainsi, les caractéristiques des milieux locaux devraient être associées à la prévalence de handicap à l'échelle locale. Cette étude avait trois objectifs : évaluer les associations entre, d'une part, la prévalence de handicap et, d'autre part, la composition socioéconomique et les caractéristiques contextuelles des milieux locaux ; estimer la part des différences de la prévalence de handicap entre les catégories urbaines/rurales qui est attribuable à la composition socioéconomique et aux caractéristiques contextuelles ; évaluer si l'association entre la prévalence de handicap et la composition varie selon le type de contexte.

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Méthodes. – La prévalence de handicap au Québec a été estimée à l'échelle des aires de diffusion (617 individus en moyenne) d'après les réponses de 20 % de la population au recensement canadien de 2001. Les milieux locaux étaient décrits par une catégorisation urbaine/rurale, la défavorisation matérielle et sociale de la population, le transport actif et collectif, la stabilité résidentielle et la qualité des habitations. Les associations entre la prévalence de handicap et les caractéristiques des milieux locaux ont été estimées à l'aide de régressions logistiques multiniveaux.

Résultats. – Le handicap était associé à la composition socioéconomique des milieux locaux ainsi qu'aux caractéristiques contextuelles. Ces associations expliquaient notamment les différences de la prévalence de handicap entre les catégories urbaines/rurales. La composition socioéconomique des milieux locaux était un facteur de confusion dans les associations observées entre les caractéristiques contextuelles et la prévalence de handicap. Certaines associations entre la prévalence de handicap et la composition socioéconomique des milieux locaux variaient également en fonction des caractéristiques contextuelles. L'importance de telles interactions entre composition et contexte était plus grande lorsqu'elle était exprimée en nombre de personnes en situation de handicap (mesure absolue) qu'en termes de prévalence (mesure relative).

Conclusion. – Les variations de la prévalence de handicap entre les catégories urbaines/rurales des milieux locaux du Québec sont attribuables à la composition socioéconomique de la population et à des caractéristiques contextuelles spécifiques à ces milieux. Ce résultat est cohérent avec une représentation des distinctions urbaines/rurales des milieux fondée sur des différences observées simultanément sur plusieurs facteurs. Bien que la composition socioéconomique des milieux locaux explique une grande part de la variabilité de la prévalence de handicap, cette étude montre que les caractéristiques contextuelles sont pertinentes dans l'analyse de la distribution spatiale du handicap car elles prédisent les variations spatiales du handicap, parfois en interaction avec la composition socioéconomique. Cette étude montre aussi que les perspectives absolues et relatives sur ces questions peuvent mener à des conclusions différentes.

1. Introduction

Disability reflects difficulty performing in social roles or in any domain of daily activities. It is considered to arise from person-environment interactions. Various conceptualisations of disability account for the contributions of environmental factors [1–3]. Among these, Verbrugge and Jette's model [2] define disability as a gap between individual's capabilities (functional limitations) and a given activity's demand. Here, features of the built, physical and social environments can influence an activity's demand, acting as either obstacles (disabling factors) or facilitators (enabling factors). Glass and Balfour [4] conceive a framework specific to neighbourhood influences in which local-area characteristics influencing disability align as four types: socioeconomic conditions; social integration; physical aspects; and services and resources. Understandings of disability as a function of person-environment interaction support the notion that heterogeneity in local-area characteristics will be associated with local-area variation in disability prevalence.

Few reports have been published on the association between disability and local-area characteristics. Those published thus far have predominantly assessed disability in relation to urban-rural differences or area-level socioeconomic status (SES). Some such studies suggest that disability prevalence is inversely associated with area-level SES [5–7]. Studies evaluating urban-rural differences have yielded inconsistent results [8–10].

Urban-rural differentiations, whether based on single variables (e.g., population density, distance to metropolitan centre) or composite measures, inevitably capture multiple differences between local-areas. The nature of local-areas emerges from a complex dynamic by which composition (i.e., the attributes of residents) and context (i.e., the attributes of places, not people) interact over time, resulting in spatially varying ensembles of intertwined factors [11–13]. Classifications of areas as either urban, rural, or some combination thereof, thus differentiate not any one particular feature but instead, groupings of multiple compositional and contextual characteristics. These include demographic, socioeconomic and behavioural features of residents as well as work and housing opportunities, level of access to health and social services [14,15].

Published observations of associations between factors labelled as local-area composition (e.g., SES or socio-demographic factors) and disability prevalence can reflect both compositional and contextual influences on disability prevalence [1–4]. In effect, variations in local population composition will tend to coincide with spatial variations in contextual factors including the distribution of local services [16–19], housing quality [20] and conditions shaping social relations [12,21]. Unless intentionally dealt with by design or analysis, many known associations between disability prevalence and local-area composition can be confounded by contextual features, and vice versa.

Among studies analysing disability prevalence in relation to local-area characteristics, few have explicitly evaluated contextual characteristics. Social ties can provide key resources necessary for individuals to perform the roles or tasks of daily living [22]. Housing quality can impact daily activities in the home environment as barriers to mobility or self-care tasks [23]. A closer proximity to local resources can assist daily living, particularly for individuals with limited mobility [24]. An improved knowledge of the specific contextual characteristics that influence disability is essential for informing policy actions (e.g., support to community organisations, housing programs, design of public places, public transportation, health and social services planning) to attenuate environmental barriers and implement additional environmental interventions to lower disability incidence.