

From the Center for Family and Community Medicine, Department of  
Neurobiology, Care Sciences and Society

# Neighborhood-level factors: barriers and assets to cardiovascular disease

## AKADEMISK AVHANDLING

som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentligen försvaras på  
engelska språket i hörsalen, Alfred Nobels allé 12, Huddinge

Torsdagen den 8 december, kl. 13.00

av

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Stockholm 2011

## ABSTRACT

**Aims** To examine whether the availability of goods, services, and resources differs by level of neighborhood deprivation (*study I*). To examine whether there are associations between neighborhood availability of potentially health-damaging (fast food restaurants and bars/pubs) and health-promoting (physical activity facilities and health care facilities) goods, services, and resources and CHD incidence (*study II*). To examine the associations between objective neighborhood walkability and walking for active transportation, walking for leisure and MVPA, and random effects in a multilevel fashion (*study III*). To examine the concordance between objective and perceived neighborhood walkability, their associations with walking and objective physical activity, and sociodemographic characteristics of individuals in neighborhoods with objectively assessed high walkability who misperceive it as low (*study IV*).

**Methods** In *study I* geocoded data from all businesses in Sweden were used to examine the distribution of 12 main categories of goods, services, and resources in 6,986 neighborhoods, categorized as low, moderate, and high neighborhood deprivation. In *study II* multilevel logistic regression models were employed for the follow-up of 1,065,000 men and 1,100,000 women (aged 35–80 years) between December 1, 2005, and December 31, 2007, for individual-level CHD events. In *study III* an index consisting of residential density, street connectivity, and land use mix was constructed to define 32 highly and less walkable neighborhoods in Stockholm City. MVPA was measured objectively with an accelerometer and walking was assessed using IPAQ. Multilevel models were used in the analysis. In *study IV* objective neighborhood walkability was assessed within a 1,000 m radius of each individual's residential address. Perceived walkability was based on the NEWS. Walking was assessed using IPAQ, and total physical activity and MVPA by an accelerometer.

**Results** In *study I* the availability of all types of goods, services, and resources was better in moderate and high-deprivation neighborhoods than in low-deprivation ones. In *study II* the associations between neighborhood availability of potentially health-damaging and health-promoting goods, services, and resources and CHD incidence were relatively weak and non-significant after adjustment for neighborhood-level deprivation and individual-level age and income. In *study III* there were positive associations between living in highly walkable neighborhoods, compared to those living in less walkable neighborhoods, and walking for active transportation, walking for leisure, and MVPA. The proportion of the total variance at the neighborhood level was low. In *study IV* one-third of individuals in neighborhoods with objective high walkability misperceived it as low. This non-concordance was more common among older and married/cohabiting individuals. High perceived neighborhood walkability was associated with more minutes of walking for transportation, walking for leisure and objectively measured physical activity compared to low perceived neighborhood walkability.

**Conclusions** Our findings are noteworthy, given the necessity to ensure that current policies are based on context-specific empirical findings so that actions do not reach beyond available evidence. Further follow-up studies are needed to disentangle causal pathways and to provide more robust evidence for use in formulating efficient neighborhood policy agendas for reducing social inequalities in health.