

GPS AND GIS FOR ASSESSMENT OF PHYSICAL ACTIVITY BEHAVIOUR OF CHILDREN WITHIN THE URBAN ENVIRONMENT

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Background and Aim: The built environment may have a role in preventing obesity by stimulating physical activity (PA) levels. Knowledge of which environmental factors affect PA, and how, is sparse. This study aims to gain insight into locations where children are physically active, using innovative GPS, accelerometer and GIS techniques, and to analyze the willingness to travel from home to school by active transport, as a function of the distance.

Methods: 88 school children (aged 5-11 years) in 5 cities in the Netherlands participated for a maximum of 7 days. The locations and intensity of their activities were recorded by GPS and accelerometer and linked with geographical information on 1) green areas, 2) surface water, 3) playgrounds, and 4) schoolyards. The actively travelled (i.e. walked or bicycled) distance between home and school was assessed using GPS and GIS data.

Results: On average children spent 1 hour and 49 minutes a day outdoors. During this time, children were often near green areas (27%) or water areas (11%). The highest PA levels were found at or around playgrounds and schoolyards. Children walked or bicycled a mean distance of 4.5 km per day. The majority of the actively travelled trips between home and school were < 500 meters long. Up to a distance between home and school of 350 meters, the willingness to travel by means of active transport is nearly 100%. At distances beyond 400 meters, the willingness decreases rapidly.

Conclusions: These findings provide better insight into the question where within the urban environment do children spend their time, where they are physically active, and how far they are willing to travel by foot or bicycle. Urban planning may provide a means to stimulate physical activity levels and health. GPS technology, in conjunction with GIS, is an insightful and promising addition to this field of research.