



Travel behaviour in persons with Multiple Sclerosis using travel diaries and GPS tracking technologies

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Setting & background

- PhD Research

“Explaining the changed activity and travel behaviour of persons with disability by means of functional limitations, socio-economic and environmental factors – A study in persons with Multiple Sclerosis”

- Collaboration between:

- Transportation Research Institute (IMOB – Hasselt University) = Activity & travel data
- REVAL Rehabilitation Research Institute (PHL / Hasselt University) = Clinical parameters – physical and cognitive functioning

- Background

- Neurological disability in young adults ~ quality of life
- Combination of symptoms
 - Fatigue, difficulties with movement execution (muscular weakness), coordination problems, memory and/or concentration problems, visual problems, and others

→ Walking difficulties, decreased driving ability, dependence on social environment?

- Few data available about real participation (restrictions) in daily outdoor activity & travel behaviour in MS

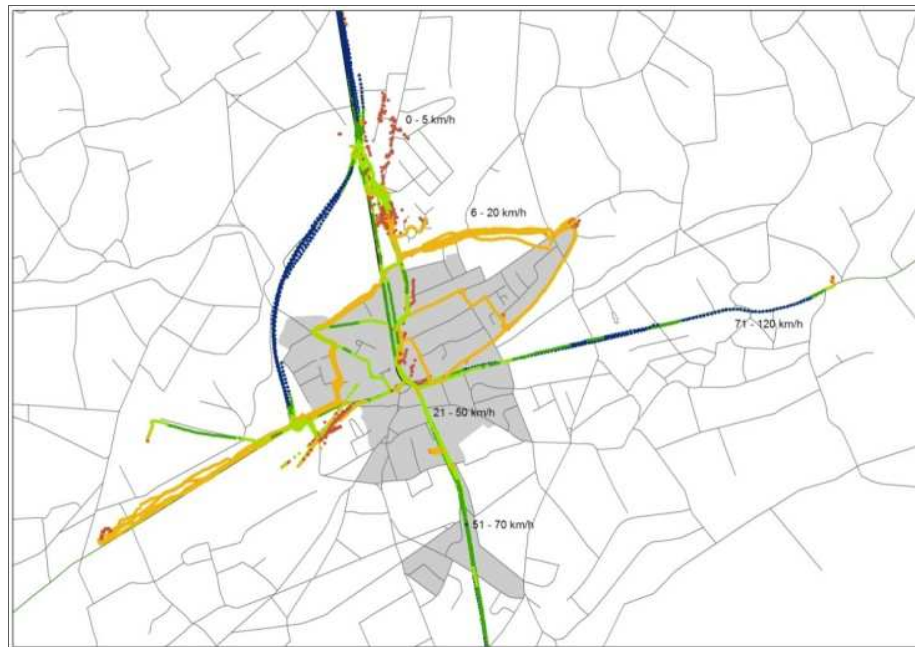




Pilot study

- “Documenting outdoor activity and travel behaviour in persons with neurological conditions using travel diaries and GPS tracking technology, a pilot study in MS”

- Which activities and trips are made?
- How many? Why?
- Transport mode?
- Company?





Methods

- Participants - 36 PwMS & 24 age/sex-matched healthy controls
 - Mild** (n=17): EDSS 1.5-4.0 + able to walk 500m without aid or some rest
 - Moderate** (n=8): EDSS 4.5-6.5 + able to ambulate 100m with uni-/bilateral assistance
 - Severe** (n=11): EDSS>6.5 + unable to walk 5m or restricted to a wheelchair
- Multidisciplinary data collection on different ICF levels
 - Clinical tests: ambulation/leg function, arm/hand function, cognition (T25FW, 9HPT, PASAT, Trail Making Test)
 - Psychosocial & activity questionnaires: impact of fatigue, anxiety and depression (MFIS, HADS)
 - Self-reported travel diary (or dictaphone) during 7 days

Hoelaat vertrok u en met wie?	Wat ging u doen en om hoelaat?	Waar ging u naartoe?	Hoe bent u daar naartoe gegaan?	Gebruikte u een hulpmiddel en was de activiteit gepland?
.... uur min <input type="checkbox"/> Alleen <input type="checkbox"/> Gezinsleden <input type="checkbox"/> Anderen	Ik kwam aan om uur min <input type="checkbox"/> Naar huis <input type="checkbox"/> Werken of zakelijk <input type="checkbox"/> Onderwijs of studie <input type="checkbox"/> Boodschappen/winkelen <input type="checkbox"/> Sociaal (bv. iemand bezoeken) <input type="checkbox"/> Verzorging (bv. revalidatie) <input type="checkbox"/> Vrije tijd (bv. sport, toneel) <input type="checkbox"/> Wandelen, fietsen of rondrijden als ontspanning <input type="checkbox"/> Iemand wegbrengen, halen <input type="checkbox"/> Diensten (bv. bank, kapper) <input type="checkbox"/> Andere, namelijk:	Straat: Postcode & gemeente:	<input type="checkbox"/> Autobestuurder <input type="checkbox"/> Autopassagier <input type="checkbox"/> Bromfiets, motor <input type="checkbox"/> Bus, tram of metro <input type="checkbox"/> Gehandicapten- vervoer (Hendriks,...) <input type="checkbox"/> Elektrische rolstoel <input type="checkbox"/> Elektrische scooter <input type="checkbox"/> Te voet <input type="checkbox"/> Fiets <input type="checkbox"/> Belbus <input type="checkbox"/> Trein <input type="checkbox"/> Manuele rolstoel <input type="checkbox"/> Andere, namelijk:	<input type="checkbox"/> Activiteit gepland <input type="checkbox"/> Activiteit niet gepland <input type="checkbox"/> Kruk, wandelstok, rollator <input type="checkbox"/> Manuele rolstoel <input type="checkbox"/> Elektrische rolstoel <input type="checkbox"/> Andere, namelijk:

Company

Activity type

Location

Travel mode



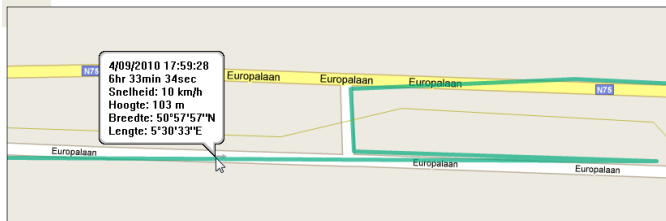
Assistive devices



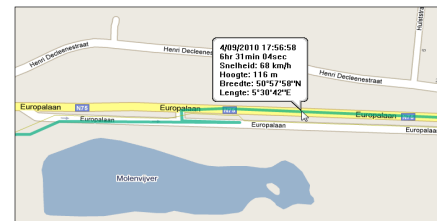


Methods (continued)

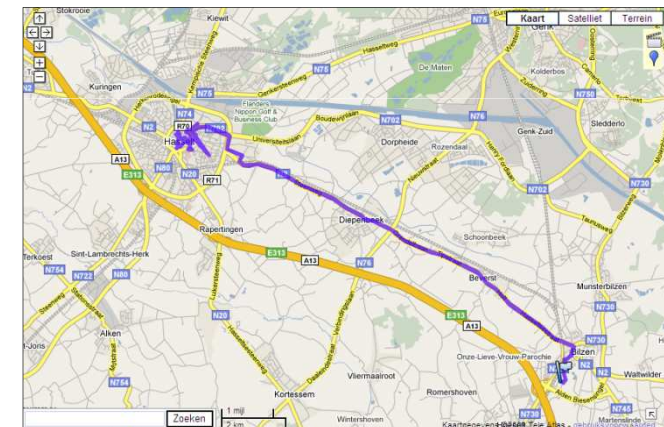
- GPS logger: detailed information about routes, type of road, visited locations, speeds + control instrument



Speed 10 km/h
➔ Slow transport mode



Speed 68 km/h
➔ Motorized transport mode





Preliminary results

- Travel mode by MS subgroups and healthy controls
 - Similar travel characteristics for mild MS subgroup and controls
 - Moderate & severe MS subgroup:
non-motorized travel modes less used, driving independently more difficult
 - Self-limiting modifications
 - Weather conditions - Time of day - Familiarity of the road
- Activity type by MS subgroups and healthy controls
 - Mild MS subgroup: Social, leisure as 'passtime'
 - Moderate & severe MS subgroup: Recurrent trips for personal care
= fitness, physiotherapist, rehabilitation
- Other significant differences
 - Daily number of trips/activities
 - Number of persons
 - Distance of trips
 - Duration of activities



Discussion

- Pilot study
 - Combination of self-report travel diaries and objective GPS loggers
 - > detailed information about actual outdoor travel behaviour
 - Significant differences in MS patients with EDSS greater than 4
 - Influence of living environment
 - > e.g. high number of independent trips by use of assistive device in severe MS subgroup: residence in the ADL-houses nearby Rehabilitation & MS Centre





Thank you for your attention!

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