Multidisciplinary Collaboration and Multi-Sector Partnership for Active Transport Research

Associate Professor Sandy Mandic
on behalf of the BEATS Study Research Team

Active Living Laboratory
School of Physical Education, Sport and Exercise Sciences
University of Otago
Email: sandra.mandic@otago.ac.nz
BEATS Research Team 2017-2018

A/Prof Sandra Mandic (Otago)
A/Prof Antoni Moore (Otago)
Dr Christina Ergler (Otago)
Dr Enrique García (Limerick)
Prof John Spence (Alberta)
Dr Debbie Hopkins (Oxford)
Dr Susan Sandretto (Otago)
Dr Kirsten Coppell (Otago)
A/Prof Michael Keall (Otago)
Dr Anna Rolleston (Auckland)

Advisory Board

Mr Gordon Wilson (DSSP)
Mr Gavin Kidd (DSSP)
Mrs Charlotte Flaherty
A/Prof Janet Stephenson (Otago)

Collaborators

A/Prof Palma Chillón (Granada)
A/Prof Melody Oliver (Auckland)

Advisory Board

Mr Nick Sargent (DCC)
Mr Graeme Rice (NZTA)

Authors
Academic and Personal Journey

Edmonton, Canada (2000-2007)
MSc, PhD

Stanford, USA (2007-2008)
Post-doc

Croatia/Serbia: BPhEd

- Clinical Exercise Physiology
- Cardiac Rehabilitation
- Cardiovascular Medicine

- Clinical Exercise Physiology
- Fitness/Physical Activity & Mortality

- Active Living and Health
- Cardiac Rehabilitation
- Clinical Exercise Physiology
Areas of research

- Physical Activity
- Public Health
- Transport
- Built Environment
- Sustainability

www.otago.ac.nz/active-living
BEATS Study Students
Research Assistants, and Volunteers
BEATS Study Research Assistants, Students and Volunteers 2018
Physical Activity in Children and Adolescents

National Survey of Children and Young People Physical Activity and Dietary Behaviour in NZ. 2007/08

Moderate-to-vigorous PA in 10- to 13-year old children

- Organized sport: 37%
- Active transport: 26%
- Chores / Miscellaneous: 13%
- Unstructured play: 24%

Transport to School in NZ: 1989-2014

1989/1990
Travel to school:
21% driven
26% walking
19% cycling

2010-2014
Travel to school:
32% driven
27% walking
3% cycling

Note: After 2004 data points are based on the average of 4 years of data per point.

Travel behaviour

Factors related to transport in general

Built Environment and Transport Behaviour

Activities: What people spend the majority of their time doing

- **LEISURE**
  - Recreation/Entertainment
- **HOME**
  - Domestic Activities
- **TRANSPORTATION**
  - Commuting
- **OCCUPATION**
  - Working or Studying

Built Environment Settings: That support physical activity in these areas

1. **OPEN SPACES/PARKS**
2. **URBAN DESIGN/LAND USE**
3. **TRANSPORTATION**
4. **SCHOOLS**
5. **BUILDINGS/WORKPLACES**

www.designedtomove.org
Built Environment and Transportation

• Walkable community design
  – Density
  – Connected streets
  – Mixed land uses
  – Access to transit

• Pedestrian & bicycle facilities
  – Access; Connectivity
  – Design; Quality; Safety

• Perceived environment: accessibility and convenience

http://switchboard.nrdc.org/blogs/kbenfield/how_communities_can_support_wa.html
Different urban layouts and social norms (e.g. private vehicle ownership) compared to NZ
The BEATS Study investigates:

- transport to school habits,
- the neighbourhood environment and
- physical activity habits

in Dunedin adolescents.

www.otago.ac.nz/beats

Mandic S et al. BMJ Open. 2016; 6:e011196
BEATS Study: Objectives

- To understand the reasons behind adolescents and their parents’ choice of transport mode to school using the ecological approach;

- To examine the interaction between the transport choices, built environment, physical activity levels, and weight status in adolescents;

- To identify policies that promote or limit ATS in adolescents

- To provide baseline data to examine future impact of:
  - The built environment changes (Dunedin Cycleway developments): *BEATS-2 Study (2019-2022)*
  - South Dunedin Bike Library
  - Cycle Skills Training in schools (*evaluation completed in 2015-2017*)
BEATS Study: A Community-Academic Research Partnership that Works

- Successful multi-sector collaboration involving academia, schools and local council
- Stakeholders involvement facilitates the generation of usable data, relevant to the local context and generalisable to other areas, and translation of knowledge into policy and future initiatives
- Generation of new knowledge to inform future school-, neighbourhood- and city/town-wide built environment changes to address barriers and encourage active transport to school in both urban and rural settings
BEATS Study Framework: Ecological Model for Active Transport

- Individual
- Social/Cultural Environment
- Built Environment
- Policy Environment

- School policy for ATS
- School’s road safety procedures
- Social support
- Social norms
- Sociodemographics
- Behaviour
- Motivations/barriers
- Walkable community design
- Pedestrian & bicycle facilities

Adapted from Sallis JF et al. Circulation. 2012;125:729-737
Mandic S et al. BMJ Open. 2016; 6:e011196
<table>
<thead>
<tr>
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<tbody>
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<td>Level</td>
<td>Students (n=2000)</td>
<td>Parents (n=1000) Peers</td>
<td>Neighbourhood School</td>
<td>School</td>
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<tr>
<td>Outcome measures</td>
<td>Demographics Travel to school Active transport to school (ATS) motivations and barriers Perceptions of built environment Health behaviours Body mass index Physical activity</td>
<td>Parental demographics Travel to school for child(ren) Parental motivations and barriers for ATS Parental perceptions of built environment Parental health behaviours</td>
<td>Geographic Information System (spatial analysis, modelling and visualisation) Perceived environment Route to school maps</td>
<td>School policy for ATS ATS-Related messages Health and safety liabilities School road safety procedures, education and messages</td>
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<td>Assessment procedures</td>
<td>Student survey Anthropometry Accelerometers Focus groups</td>
<td>Parental survey, accelerometers and focus groups Student survey (for peers)</td>
<td>GIS Analysis Questionnaires Maps</td>
<td>Teachers’ Focus Groups School Principals’ interviews</td>
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Mandic S et al. BMJ Open. 2016; 6:e011196
BEATS Study Research Methodology

Adolescents & Parents
Survey
Maps; GIS Analysis
Anthropometry
Physical Activity

School bag weight
Adolescents

Focus groups
Adolescents, Parents, Teachers

Interviews
School Principals

Mandic S et al. BMJ Open. 2016; 6:e011196
BEATS Study Framework: Ecological Model for Active Transport

Adapted from Sallis JF et al. Circulation. 2012;125:729-737

Mandic S et al. BMJ Open. 2016; 6:e011196

May 2013

Policy Environment

Built Environment

Social/Cultural Environment

Individual

Exercise Science
Public Health
Transportation
Built Environment
Education
How to pull this off
and
who is going to pay for it?
Building a Multidisciplinary Research Team

- **Exercise science**: Dr Sandy Mandic
- **Policy makers**: Charlotte Flaherty
- **Geographic information science**: Dr Tony Moore
- **Behavioural medicine**: Prof John Spence
- **Health promotion**: Dr Enrique García Bengoechea
- **Statistics**: Dr John Williams
- **Quantitative research methods**: Drs Williams/Mandic
- **Qualitative research methods**: Dr Debbie Hopkins

**BEATS Study**
Built Environment and Active Transport to School

(2013-2014)
Building Research Collaborations (2013-2014)

Dr Sandy Mandic

Dr Tony Moore

Dr John Williams

Mrs Charlotte Flaherty

Prof John Spence

A/Prof Enrique García

Dr Debbie Hopkins
Establishing Links with the Community and Forming BEATS Advisory Board

Dunedin Secondary Schools’ Partnership

- Mr Gordon Wilson
- Mrs Ruth Zeinert
- Prof Janet Stephenson (Otago)

Getting Dunedin Active Initiative

- Mr Andrew Lonie
- Dr Tara Duncan (Otago)
- Dr Susan Sandretto (Otago)

Centre for Sustainability
Agriculture • Food • Energy • Environment
Ka Rakahau o Te Ao Tūroa

Department of Tourism
Te Matauraka Tīpī

College of Education
Te Kura Akau Taitoka
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Aug 2014
Developing Study Materials

Built Environment and Active Transport to School: The BEATS Study

Background

Despite multiple benefits of physical activity, the lack of physical activity and sedentary lifestyles in school-age children is a global health problem. Active transport to school is a convenient way to integrate physical activity into everyday life, maintain or increase physical activity levels, and may develop into environmentally sustainable travel practices over a lifetime.

The BEATS Study has been designed to investigate active transport to school habits in adolescents using the most contemporary and comprehensive theory for active transport; this accounts for individual, social, environmental, and policy influences. (Figure 1).

Research Design and Methodology

The BEATS Study will survey students, parents, and teachers in Dunedin secondary schools (Figure 2). Using an online questionnaire, this study aims to survey 2,000 students (about 1/5 to 200 students per school), 1,000 parents (80 to 100 parents per school) and 100 school teachers (8 to 10 teachers per school) from 12 secondary schools in Dunedin. Some participants may also decide to take part in focus groups, physical activity, and anthropometry assessments.

Purpose

- To understand the reasons behind adolescents and their parents’ choices of transport mode to school using the ecological approach;
- To examine the interaction between the transport choices, built environment, physical activity levels, fitness, and weight status in adolescents;
- To identify policies that promote or limit ATS in adolescents.

Significance and Implications

The findings will provide valuable and unique information for schools, city councils, transport agencies, and land planners.

The results from this study will inform:
- Future interventions for built environment change, education campaigns,
- School policy development, and
- City policy development.

Collaboration

The BEATS Study is in collaboration with the University of Otago, the Dunedin Secondary Schools’ Partnership, and Dunedin City Council.

BEATS Research Team

- Principal Investigator: Dr. Daryl Mandel, School of Physical Education, Sport and Exercise Sciences
- Associate Investigators: Dr. Tony Moore, School of Surveying, University of Otago; Dr. John Williams, Department of Marketing, University of Otago; Prof. John C. Taylor, University of Alberta, Edmonton, Canada; Dr. Enrique Garcia Benitez, McGill University, Montreal, Canada; Dr. Tina Doreen, Department of Tourism; Dr. Daphne Hope, Postdoctoral Research Fellow, University of Otago; Dr. Harteke Carr, Ministry of Health, Wellington
- Project Coordinator: Ashley Mountfort, Bib

For more information about the BEATS study, please visit our study website. The website provides information for schools, students, parents, teachers, researchers, and policy makers.

www.otago.ac.nz/beats
BEATS Study

Information for study participants
Information for researchers and policy makers
Research team
Publications
Prospective graduate students
Volunteers
News and events
Contact us

The findings from this study will provide valuable and unique information for schools, city councils, transport agencies and land planners.

The results will suggest potential ways to encourage students’ active transport to school and increase physical activity levels in adolescents.

The results will also help inform future interventions for built environment change, education campaigns, school policy development and city policy development.

www.otago.ac.nz/beats
BEATS Study School Recruitment: 100% (12 schools)
Data Collection in Schools (2013-2015)