

On the science and the use of the Health Economic Assessment Tool (HEAT) for walking and cycling

OUVEMA Webinar series

(*observatoire universitaire du vélo et de la mobilité active, university observatory of cycling and active mobility*)
12 October 2021



Sonja Kahlmeier, Swiss Distance University of Applied Science FFHS, Zurich, Switzerland

Francesca Racioppi, WHO Regional Office for Europe

Goetschi T, Cavill N, Castro-Fernandez A, Brand C, Rojas Rueda D, Woodcock J, Kelly P, Lieb C/Sommer H, Oja P, Rutter H

Three important reasons to promote active mobility

- To promote health and reduce noncommunicable diseases
- To increase urban resilience to e.g. climate change, pandemics
- To contribute to protect the planet by reducing carbon emissions

Regular cycling and walking (e.g. achieving the WHO guidelines) reduces total premature mortality by ≈10 %

Kelly et al. *International Journal of Behavioral Nutrition and Physical Activity* 2014, 11:132
<http://www.ijbnpa.org/content/11/1/132>



RESEARCH

Open Access

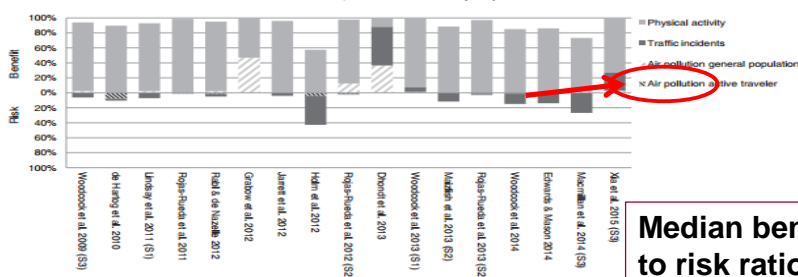
Systematic review and meta-analysis of reduction in all-cause mortality from walking and cycling and shape of dose response relationship

Paul Kelly^{1,2*}, Sonja Kahlmeier³, Thomas Götschi³, Nicola Orsini⁴, Justin Richards⁵, Nia Roberts⁶, Peter Scarborough¹ and Charlie Foster¹

<http://www.biomedcentral.com/content/pdf/s12966-014-0132-x.pdf>

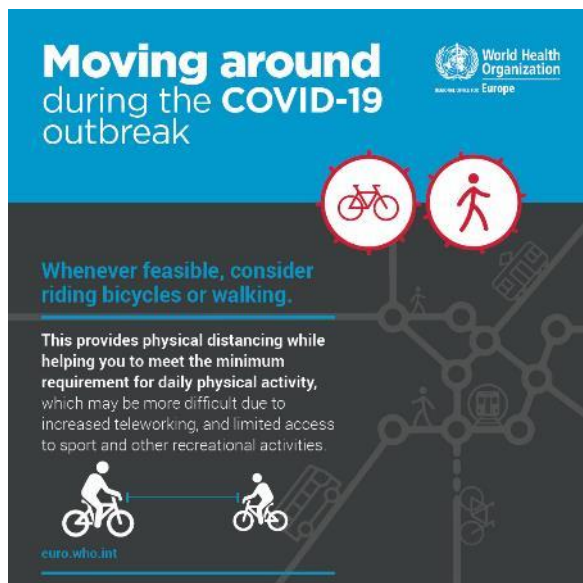
Do the benefits outweigh the risks...?

Comprehensive health impact assessment to estimate the risks and benefits of cycling and walking



Median benefit to risk ratio: 9:1

N. Mueller et al. / *Preventive Medicine* 76 (2015) 103–114
<http://dx.doi.org/10.1016/j.ypmed.2015.04.010>



WALKING, CYCLING AND COVID-19: the individual perspective

- Provides access while **maintaining physical distance**;
- Helps meeting the WHO guidelines for **physical activity**;
- Highly **feasible** (more than 50% of car trips are shorter than 5 km)
- Helps **reducing the need for private motorized transportation** as an alternative to public transport

Source: WHO, 2020 <http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus/covid-19/moving-around-during-2019-nCoV-technical-guidance-CLD/coronavirus-disease-covid-19-outbreak-technical-guidance-europe-CLD/moving-around-during-the-covid-19-outbreak>

5



What is the HEAT?

- Online tool www.heatwalkingcycling.org
- Designed for transport planners
- Economic assessment of health benefits of walking or cycling
- Effects on mortality 'only'



HEAT “core principles”

- Scientific robustness
- Usability
 - Minimal data input requirements
 - Availability of default values
 - Clarity of prompts/questions
 - Design and flow of the tool
- Transparency
 - Approach and assumptions
- Conservative
- Adaptable
- Modular

What can you use it for?

- **Assessing current (or past) levels of cycling/walking**
 - What is walking/cycling worth now in my city, region, country?
- **Assessing changes over time**
 - E.g. before – after, scenario A vs. scenario B
- **Evaluating new or existing projects**
 - Value of health benefits of investments and benefit–cost ratios

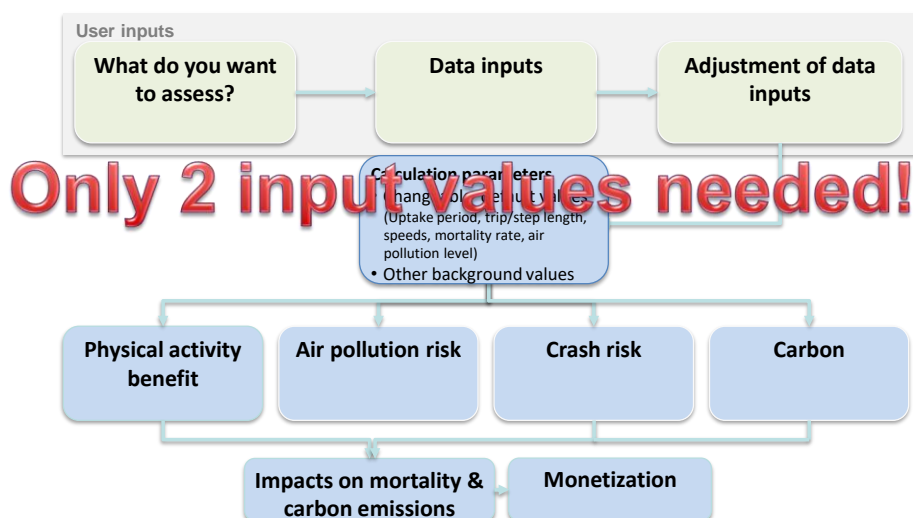
The question

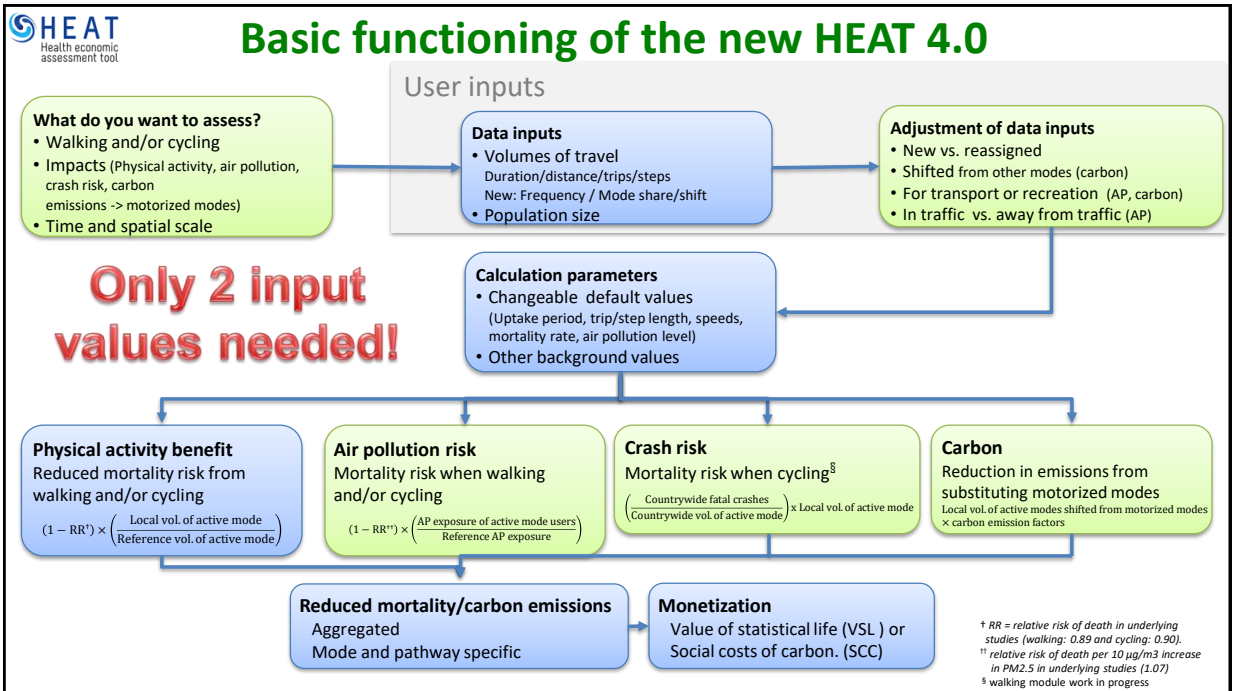
If x people walk/cycle an amount of y on most days, what is the economic value of the health benefits that occur as a result of the reduction in mortality due to their additional physical activity?

Additional HEAT options since 2017

- How much do air pollution or crashes affect these results?
- What are the carbon effects?

HEAT workflow (simplified)





Worldwide use

- Project website visited about 980'000 times by over 62,000 visitors since 2011
- (but: webstats not fully comparable since launch of HEAT 4.0)
- Variety of applications
- At least 30 scientific publications using HEAT

11,994

Last 18 months

1. United Kingdom	1. United Kingdom
2. United States	2. United States
3. Italy	3. China
4. Germany	4. Germany
5. Canada	5. Finland
6. France	6. Italy
7. Australia	7. Spain
8. Spain	8. France
9. Finland	9. Sweden
10. Belgium	10. Brazil
11. Switzerland	11. Netherlands
12. Sweden	12. Canada
13. Netherlands	13. Australia
14. Brazil	14. Austria
15. Austria	15. Switzerland

"Health in All Policies" in Practice: Guidance and Tools to Quantifying the Health Effects of Cycling and Walking
Sergio Kallinikos, Francesca Ricciardi, Nick Cavill, Harry Rutter, and Pirkko Oja

Examples of applications of the health economic assessment tool (HEAT)

- FOR THE UK:**
 - HEAT has been used to estimate the potential health benefits of walking and cycling in London.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in the UK.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in the UK.
- FOR THE US:**
 - HEAT has been used to estimate the potential health benefits of walking and cycling in the US.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in the US.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in the US.
- FOR OTHER COUNTRIES:**
 - HEAT has been used to estimate the potential health benefits of walking and cycling in other countries.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in other countries.
 - HEAT has been used to estimate the potential health benefits of walking and cycling in other countries.

HEAT Health economic assessment tool

HEAT - a collaborative project

World Health Organization Europe

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

NATURAL ENGLAND

MINISTERIUM FÜR EIN LEBENSWEERTES ÖSTERREICH

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

REPUBLIC OF FRANCE

PHYSICAL ACTIVITY THROUGH SUSTAINABLE TRANSPORT APPROACHES

THE PEP Transport, Health and Environment Pan-European Programme

UNECE

World Health Organization Europe

Norwegian Ministry of Foreign Affairs

Christian Brand, Nick Cavill, Audrey de Nezelle, Rahul Goel, Paul Kelly, Christoph Lieb, David Rojas Rueda, Harry Rutter, Andreia Santos, Masud Yunesian, Lucy Saunders, Amanda Ngabirano, Jose Lobo, Gabriel Michel, Elisabeth Belpaire, Holger Haubold, Michal Krzyzanowski, Damien Dussaux, Lan Wang, Yousaf Ali, Shifalika Goenka, Yahaya Hassan Said, Rogerio Gama, Miriam Weber, Shari Schafflein, Francesca Racioppi, Sonja Kahleiner, Thomas Gotschi, Maria Neira, Pierpaolo Mudu, Fiona Bull, Melekidhisi Khayesi, Nino Sharashidze, Juan Castillo, Genandrialine Peralta, Hussain Rasheed, Mazen Malkawi, Heba Adel Moh'd Safi, Guy Mbayo, Daniel Buss, Marco Martuzzi, Stefanie Holzwarth, Julie Powell, Caryl Koinange, Parth Sarathi Mahapatra, Uttam Paudel, Nelzair Araujo Vianna, Adriannah Mbandi, Keiko Nakamura, Vo Thi Hue Man, Tian Xiangyang, Hou Xiaohui, Luis Jorge Hernandez, James Woodcock, Heini Sommer, Pekka Oja, Karim Abu-Omar, Lars Bo Andersen, Hugh Ross Anderson, Finn Berggren, Olivier Bode, Tegan Boehmer, Nils-Axel Braathen, Hana Bruhova-Foltynova, Dushy Clarke, Andy Cope, Baas de Geus, Ardine de Wit, Hywell Dinsdale, Rune Elvik, Mark Fenton, Jonas Finger, Francesco Forastiere, Richard Fordham, Charlie Foster, Virginia Fuse, Eszter Fuzeki, Frank George, Regine Gerike, Eva Gleissenberger, George Georgiadis, Anna Goodman, Maria Hagströmer, Mark Hamer, Eva Heinen, Thiago Herick de Sa, Marie-Eve Heroux, Max Herry, Gerard Hoek, Luc Int Panis, Nicole Iroz-Elardo, I-Min Lee, Brian Martin, Markus Maybach, Irina Mincheva Kovacheva, Hanns Mooshammer, Marie Murphy, Nanette Mutrie, Bhash Naidoo, Daisy Narayanan, Mark Nieuwenhuijsen, Ase Nossum, Laura Perez, Randy Rzewnicki, Gabe Rousseau, Candace Rutt, Kjartan Sælensminde, Elin Sandberg, Alexander Santacreu, Lucinda Saunders, Daniel Sauter, Peter Schantz, Tom Schmid, Christoph Schreyer, Christian Schweizer, Peter Sørensen, Jan Sørensen, Joe Spadaro, Gregor Starc, Dave Stone, Marko Tainio, Robert Thaler, Miles Tight, Sylvia Titze, Wanda Wendel Vos, Paul Wilkinson, Mulugeta Yilma

Software development and design: Tomasz Szreniawski, Alberto Castro Fernandez, Ali Abbas, Vicki Copley, Duy Dao.

Expertises involved:

“Simplicity is a
complexity resolved”
(Constantin Brancusi)

<http://www.heatwalkingcycling.org>

HEAT v4.2

Welcome to the Health Economic Assessment Tool (HEAT) for walking and cycling by WHO/Europe

→ May 2019 Update to HEAT v4.2 with new data input page, annual bug fixes, and substantially revised underlying code (see [News for details](#))

The HEAT tool is designed to enable users without expertise in impact assessment to conduct economic assessments of the health impacts of walking or cycling. The tool is based on the best available evidence and transport assumptions. It is intended to be simple to use by a wide variety of professionals at both national and local levels. These include primarily transport planners, health engineers and social research groups working on transport, walking, cycling or the environment.

The HEAT estimates the value of reduced mortality that results from specified amounts of walking or cycling, answering the following question: **if people regularly walk or cycle an amount of x, what is the economic value of the health benefits that occur as a result of the reduction in mortality due to their physical activity?**

In addition, HEAT can now also take into account the health effects from road crashes and air pollution, and effects on carbon emissions.

The tool can be used for a number of different assessments, for example:

- assessment of current (or past) levels of cycling or walking, e.g. showing what cycling or walking are worth for your city or country;
- assessment of changes over time, e.g. comparisons of 'before and after' situations, or 'scenario A vs. scenario B' (e.g. with or without measures taken);
- evaluation of new or existing projects, including benefit-cost ratio calculations.

HEAT can be used as a stand alone tool or to provide input into more comprehensive economic appraisal exercises, or prospective health impact assessments.

What kind of results can you produce with your local data or scenarios? See examples here.

More information on how HEAT works can be found here. A detailed description of the development process, evidence used and main project steps as well as a data by step guide can be found in the [Methodology and user guide](#).

More information and materials are also available at <http://www.heat.who.int/HEAT>

For questions or comments on HEAT please email to heatwalkingcycling@who.int.

Start using the tool

What kind of results can you produce with your data? Examples.