

**Development of the Health economic assessment tools (HEAT) for walking and cycling
6th Consensus group meeting**

**Remote participation
29 & 30 June 2021**

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MEETING REPORT

1. Executive summary

Coordinated by the WHO, steered by a core group of multi-disciplinary experts and supported by ad-hoc invited relevant international experts, the HEAT¹ project holds advisory group and consensus meetings to discuss and agree upon methodological updates and new features of HEAT. The 6th Consensus meeting included experts representing other world regions beyond the WHO European region, for which the tool was originally developed. The meeting was convened to achieve scientific consensus on 6 specific recommendations for further development, and agreed:

- 1) to continue using all-cause mortality (ACM) also for HEAT assessments in a global context (i.e. also outside European Region of WHO), and to address considerations regarding the potential influence of varying underlying causes of death in additional user guidance on the HEAT website;
- 2) to rephrase the user guidance on the proposed scope of the HEAT;
- 3) to conduct a dedicated discussion with experts working in the area of the Value of a Statistical Life (VSL) used by HEAT to address the open issues;
- 4) to include the new data entry options for air pollution, cycling and walking crash risk data, and population size data for global use;
- 5) to pursue the development of different user interfaces with varying degrees of detail; and
- 6) to start a development project to integrate e-biking into the HEAT.

The meeting included 45 participants, comprising members of the HEAT advisory group and invited experts, as well as 14 participants of WHO Regions (including AFRO 1; EMRO 2; EURO/WHO European Centre for Environment and Health 3; PAHO 2; SEARO 1; WPRO 5), 3 UN Staff members and 8 participants from WHO Headquarters.

Participants discussed and adopted six recommendations and provided further comments, which will be taken into account in their implementation to facilitate finalization of a HEAT version 5.0 for global application. Finally, participants discussed the plans for rollout and dissemination of the new version and agreed next steps.

¹ www.heatwalkingcycling.org

Contents

Executive summary	2
1 Introduction and background	4
2 Welcome and introduction to the scope of the meeting	5
3 Summary of the main discussion points	6
3.1 Type of mortality rate	6
3.2 Long-term physical activity behaviour requirement	8
3.3 Economic valuation methodology in the HEAT global context	9
3.4 Data entry options for global use	11
3.5 Future HEAT user interfaces for different user groups and integration of bike sharing	12
3.6 Proposal to integrate e-biking	13
3.7 Global rollout and dissemination strategy	14
3.8 Next steps and other items	15
4 Closing	15
Annex 1 Meeting programme	17
Annex 2 List of participants	19

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1 Introduction and background

The World Health Organization (WHO) has long recognized the importance of integrating health and economic considerations into transport policies and interventions. Coordinated by the WHO Regional Office for Europe, steered by an advisory group of multi-disciplinary experts and supported by ad-hoc invited relevant international experts², a project was started in 2005, aimed at developing guidance and a practical tool for economic assessments of the health effects from cycling and from walking. The main goal of the project is the development of the Health Economic Assessment Tool (HEAT) for walking and cycling, a harmonized method for economic valuation of health effects of cycling and walking, based on best available evidence and international expert consensus. HEAT calculates: if x people cycle or walk y distance on most days, what is the economic value of all-cause mortality changes? (www.euro.who.int/HEAT). The HEAT version 4.0 was launched in fall 2017³; the current online version 4.2 contains some updates made since. It also takes into account the health impacts of cyclists' and pedestrians' exposure to air pollution and of traffic crashes, and it considers effects on carbon emissions.

HEAT is primarily intended for a non-academic audience of transport planners, traffic engineers, economists and special interest groups working at the national or local level. Since this audience may not necessarily have ready access to epidemiological and economic expertise and modelling tools, usability is central to the HEAT. The key goal is to make it possible to run a basic assessment in a short time, without the need for any professional health or economic background, and with minimal user inputs, while, at the same time, ensuring a robust scientific standard and transparency of methods and assumptions. HEAT is not intended to be a comprehensive health impact assessment tool but aims at providing an estimate of direction and magnitude of the economic value of the health effects (currently focussing on all-cause mortality only) of regular walking and cycling based on minimal data input for use in economic assessments in transport planning, such as cost-benefit analyses of different transport and land use development options. However, experience shows that the HEAT also finds resonance in the health sector as well as with advocacy groups on transport, climate change, health or physical activity, and as a training tool in academic contexts.

Since 2011, HEAT has been continuously developed by a collaborative team of researchers, policy makers and practitioners and applied across many European countries. Despite its focus on Europe, it has also been used in the Americas, Asia, Australia and Africa. In 2019, in response to the growing international interest in walking and cycling for transport, sustainability and physical activity promotion, and in HEAT in particular, as part of WHO's Urban Health Initiative (UHI) a HEAT prototype for global use has been developed, and

² See full lists at www.heatwalkingcycling.org

³ Kahlmeier S et al. Health economic assessment tool (HEAT) for walking and for cycling. Methods and user guide on physical activity, air pollution, injuries and carbon impact assessments. Copenhagen: WHO Regional Office for Europe; 2017. Available [online](#).

pilot tested by collaborators in different contexts from all WHO regions. Also in 2019, an option considering bike-sharing has also been developed as part of the HEAT-global prototype, with the support of the Pan-American Health Organization / Regional Office for the Americas of the World Health Organization (WHO).

The specific objectives of this Consensus Group meeting were to achieve scientific consensus on:

- the intention to expand the usability of the HEAT to other WHO Regions worldwide, by considering in particular:
 - a. The mortality rate to be used in the tool in the global context, based on best available evidence, feasibility and state-of-art knowledge as well as the user guidance on the long-term nature of physical activity behaviour;
 - b. The methodological approach for the economic valuation of the health impacts, in particular for the estimation of the Value of a Statistical Life, based on best available evidence, feasibility, and state-of-art knowledge;
- Options to improve HEAT usability, including the additional data entry options to accommodate for the lack of default values on air pollution exposure and crash risk data, the derivation of population size data, and considerations regarding HEAT user interfaces for different user groups (e.g. slim and full interface features);
- Options for future developments in the tool, including the incorporation of e-biking aspects throughout the tool modules.

2 Welcome and introduction to the scope of the meeting

Maria Neira, Director, Public Health and the Environment Department, WHO Headquarters, extended a warm welcome to the participants of the 6th HEAT Consensus Group Meeting. She underlined the importance that the promotion of active transport through cycling and walking has gained in policy frameworks over recent years, including for example its “Manifesto for a Healthy and Green COVID-19 Recovery⁴”, which includes a call to build healthy, liveable cities, as well as a range of WHO policies on transport, physical activity, climate change and health. She explained that now was an excellent time to scale up the dissemination and use of the HEAT to a global level, based on its successful pilot testing of a global prototype and increasing requests for such a tool from world regions outside of the European Region. Francesca Racioppi, Head of Office at WHO European Centre for Environment and Health, welcomed the participants on behalf of the WHO Regional Office for Europe. She recalled that with this 6th Consensus Meeting, HEAT entered into new territories in 3 ways: by holding for the first time a consensus meeting in an online format, by holding its first global Consensus Meeting and by seeing the highest number of participants to date.

⁴ www.who.int/news-room/feature-stories/detail/who-manifesto-for-a-healthy-recovery-from-covid-19

She then introduced the key features and principles of the HEAT and acknowledged the collaboration by many experts and institutions since the inception of HEAT in 2011. She then introduced the main goals of the meeting. Finally, she proposed the appointment of Michal Krzyzanowski, consultant and chair of previous HEAT Consensus Meetings, as chair of the meeting, and Sonja Kahlmeier, member of the HEAT coordinating team (Swiss Distance University of Applied Science, Department of Health), as rapporteur. The meeting agreed with this proposal.

Thiago Hérick de Sá, Technical Officer Urban Health, Transport and Health, WHO Headquarters, outlined the adaptation of HEAT since 2017 to facilitate global use. He underlined the importance of keeping it scientifically robust and yet user-friendly. Finally, he presented the agenda, which was divided into four parts, including firstly a discussion on proposed adaptations of the health impact assessment methodology. The second part was dedicated to proposed amendments to the economic valuation methodology in the HEAT global context. The third part of the meeting was to focus on other proposed adaptations of the HEAT, including new data entry options and future user interfaces for different user groups. The fourth part concluded with an outline of elements of a HEAT the next steps.

The meeting included 45 participants, comprising members of the HEAT advisory group and invited experts, as well as 14 participants of WHO Regional Offices (including AFRO 1; EMRO 2; EURO/WHO European Centre for Environment and Health 3; PAHO 2; SEARO 1; WPRO 5), 3 UN Staff members and 8 participants from WHO Headquarters.

3 Summary of the main discussion points

3.1 Type of mortality rate

Sonja Kahlmeier introduced the first topic and recommendation, related to the type of mortality rate to use in a global context. HEAT is based on the use of all-cause mortality (ACM). This choice was made as a quantitative estimate of effect from cycling had become available at the time of the HEAT development, and because this is one of the most reliable health endpoints with less variation in recording and reporting than cause-specific mortality. The underlying relative risk used for HEAT⁵ is also based on ACM. In the development of the HEAT global prototype, one concern was whether in a global context, the use of ACM might unduly inflate impact estimates (e.g., due to higher shares of infectious diseases less directly linked to physical activity included in baseline mortality rates used). Therefore, 4 options were presented to test users in an earlier HEAT global prototype (ACM, ACM excluding non-natural deaths (i.e. injuries), NCDs-related

⁵ Kelly, P., et al., Systematic review and meta-analysis of reduction in all-cause mortality from walking and cycling and shape of dose response relationship. *International Journal of Behavioral Nutrition and Physical Activity*, 2014. 11(132). <https://doi.org/10.1186/s12966-014-0132-x>

mortality (according to WHO categorization), mortality due to selected NCDs associated with physical activity).

While the HEAT advisory group had acknowledged that ACM included a substantial share of non-physical-activity-related deaths, such as communicable diseases and non-natural deaths (injuries), currently available evidence was not considered to be sufficient for a clear proposal to exclude certain causes of deaths. Furthermore, an adjustment of the relative risk used in HEAT (based on ACM as well) would be warranted. In addition, non-communicable diseases (NCD's) are an increasing global problem also in low- and middle-income countries. Therefore, the recommendation no. 1 was made to continue using ACM also for HEAT assessments in a global context (i.e. also outside the European Region).

Many participants supported this recommendation, in particular in view of the lack of reliable data on cause-specific mortality in many low- and middle-income countries. In addition, ongoing research indicates that benefits of physical activity from ACM are larger than the sum of benefits of already known related specific diseases; this points to open questions of research and supports the HEAT to follow its usual approach to wait for robust evidence to become available before amending its methodological approaches. At this stage, excluding certain causes of death would be a mostly arbitrary decision and would increase uncertainty rather than robustness of the HEAT. In addition, pilot testing had revealed that asking users to make a choice among these different options would be difficult for many users lacking expertise to make an informed choice on this topic. Thus, while more flexibility was supported by various participants, additional options should only be offered if they provided an actual gain to a sufficiently large share of users. It was also reminded that this recommendation related to default values provided by HEAT, which each user can overwrite with their own data, as available (e.g. using local mortality rates for a specific neighbourhood rather than the national default rates provided by HEAT).

At the same time, several participants welcomed additional guidance for users to acknowledge the open research questions and gaps around the influence of physical activity on different causes of death and the potential risk of unduly inflating baseline mortality rates in some populations (e.g., due to higher shares of injuries or violent deaths). It was also suggested to reinforce the already existing call⁶ to users to test the influence of using different rates as a part of a sensitivity analysis.

In conclusion, the **recommendation no. 1** was adopted by the participants, namely to:

- continue using all-cause mortality (ACM) also for HEAT assessments in a global context (i.e. also outside European Region of WHO)

⁶ Suggestion to carry out sensitivity analysis already included on the final HEAT results screen.

- address considerations regarding the potential influence of varying underlying causes of death in additional user guidance on the HEAT website.

3.2 Long-term physical activity behaviour requirement

Sonja Kahlmeier reminded that when the HEAT was originally developed and officially launched in 2011, one of the agreed requirements for its applicability was that the assessed physical activity behaviour be habitual, such as cycling or walking for commuting, or regular leisure time activities. Users are discouraged to use the tool for the evaluation of one-day events or competitions (such as occasional walking or cycling days etc.), since these are unlikely to reflect long-term average behaviour, through the following phrasing as part of the scope for the use of the HEAT: *“HEAT is designed for habitual behaviour, such as cycling or walking for commuting, or regular leisure time activities. Do not use it for the evaluation of one-day events or competitions (such as walking or cycling days etc.), since they are unlikely to reflect long-term average behaviour.”*

However, there are two main considerations to take into account in relation to this restriction of the proposed scope of the HEAT. Firstly, aggregated data estimates (e.g. from travel surveys, trail counts, bike sharing schemes) are also likely to include some very low or irregular amounts of cycling or walking. In addition, some “one-day” events happen on a regular recurring basis, e.g. monthly or even weekly, (e.g. open streets / Ciclovía recreativas), and as such are likely to include a share of regular users (over time). Secondly, HEAT applies a linear dose-response relationship, thus every amount of PA (of a certain habitual nature) is treated equal. Therefore, recommendation no. 2 was to rephrase the user guidance on the proposed scope of the HEAT to reflect varied use cases, including a certain share of sporadic physical activity behaviour, while at the same time maintaining an encouragement to favour uses that reflect habitual behaviour.

While some participants supported the notion that “every minute should count” (based on HEAT’s linear dose-response relationship), overall participants agreed that a rephrasing could be supported if maintaining a clear statement to favor uses that reflect a “regular”/“routine” behaviour, in line with the epidemiological evidence. More information shall also be added on the mathematical approach underlying the HEAT calculations, namely that an annual average is derived including the assumption that any volume of cycling or walking is repeated annually. Phrasings shall be clarified, e.g by using the term “one-off” rather than “one-day”, as e.g. Ciclovías events may start out as one-day events, which are, however, over time often developing into a regularly repeated weekly event. While some participants supported the notion that assumptions could be taken on the change of routine behaviour from promotional events, others cautioned against that by calling for evidence-based assumptions. Instead, HEAT should aim at providing more examples of suitable case studies and interventions; as a future development, evidence on the impact of (recurring) one-day events could be included as available.

In addition, participants also called for using a more neutral language with regards to suitable travel purposes (i.e. to include active transport trips other than commuting or leisure, in particular those related to running errands or childcare). HEAT needs to ensure an equitable reflection of transport behaviour in all population groups and world regions, also reflecting that in some parts of the world, cycling or walking is more often the result of a lack of other choices (e.g. economically or due to the lack of other transport services/options) than a deliberate choice in favour of sustainable transport, climate change or health.

Recommendation no. 2 to rephrase the user guidance on the proposed scope of the HEAT was adopted. The exact phrasings are to be developed in close exchange with the HEAT Advisory Group and interested participants to:

- reflect varied HEAT use cases, including a certain share of sporadic physical activity behaviour
- while at the same time maintaining a clear statement to favour uses that reflect “regular”/“routine” behaviour, in line with the epidemiological evidence
- rephrase guidance also regarding trip purposes to be more inclusive
- develop phrasings that take into account cultural differences and sensitivities and that avoid misunderstandings as much as possible
- aim at developing tailored guidance (e.g. case studies) on suitable scenarios and interventions
- provide a transparent presentation of how the tool treats inputs on “sporadic” activity mathematically.

3.3 Economic valuation methodology in the HEAT global context

Andreia Santos, Consultant in Health Economics, Physical Activity Unit, Department of Health Promotion, World Health Organization (and London School of Hygiene and Tropical Medicine, University of London) introduced that for the monetization of the effects on mortality, HEAT uses the “Value of statistical Life” (VSL). The VSL is derived using a method called “willingness to pay” assessment. It aggregates individuals’ willingness to pay to secure a marginal reduction in the risk of premature death. The VSL is not the value of an identified person’s life but rather an aggregation of how society values small changes in risk of death. According to economic theory, the willingness to pay captures perceptions of risks and potential costs borne by the individual person rather than society, including immaterial costs (such as suffering). Thus, it should account for multiple domains, including consumption, inability to work, the healthcare costs the individual pays (and not insurers) and their own pain and suffering. Thus, it represents the societal economic value of reduced premature mortality.

The current VSL calculation approach and deriving country-specific default VSL values for the European Region is based on a systematic review and meta-analysis of the OECD of 2012⁷, using parameters devised

⁷ [Mortality Risk Valuation in Environment, Health and Transport Policies, OECD, 2012](#)

for the European's context⁸. For the global context, preparatory work showed the approach needs adjustments, including the following aspects:

1. updating various parameters to more recent values (i.e. 2017).
2. consideration to base the calculations instead on Gross National Income (GNI) instead of Gross Domestic Product (GDP; which includes income from citizens abroad)
3. offering to users to choose between a VSL in local currency, in US\$ using MER (market exchange rate, suitable in a local cost-benefit context when reporting/accounting is required) or in US\$ using PPP (purchasing power parity, suitable for international comparisons)
4. defining the most appropriate approach to selecting suitable income elasticity values per country
5. defining the most suitable approach to the benefit transfer, including a spatial transfer adjusting the OECD value to a country-specific value, and a temporal transfer adjusting the 2005 value to a current value.

In addition, exchange is foreseen with other WHO projects and tools (such as AirQ+) to support harmonization of approaches between WHO tools regarding these issues.

Unlike for other aspects of the HEAT methodology, in this case the literature does not provide one generally accepted approach to some of these aspects. Therefore, the recommendation was to adopt points 1-3 above, and to conduct a dedicated discussion of economic experts to address the remaining issues 4-5.

The discussion focused on two main topics: the best way to approach the open questions described above, and the suitability of the VSL for HEAT assessments in general. Regarding the first topic, interventions demonstrated that indeed, not one single accepted approach does exist to the questions at hand, and that a dedicated follow-up discussion involving selected economic experts, including some meeting participants, is the most appropriate way forward.

Regarding the second discussion topic, there were interventions pointing to challenges posed in explaining the meaning of the VSL to policy makers in countries where it is not often used (both within and outside the transport area), while in other countries, it is well understood. In addition, some participants voiced concerns that the VSL can be misunderstood to value individual lives and that the HEAT should refrain from portraying it as the best possible approach. As part of the further development work, the HEAT project should look into which metrics are currently being used in transport appraisals (including but also beyond the VSL), and how its approach and meaning can be better communicated. Some participants supported looking into the use of other result metrics avoiding a purely economic assessment (e.g. "social return on investment"); however,

⁸ For details, see also <https://www.heatwalkingcycling.org/#vsl>

historically, providing an approach to allow for an economic assessment (next to the number of premature deaths averted) had been a key goal of the HEAT project, and at the time, the VSL was the most appropriate metric, being widely used in transport economic assessments.

In addition, the HEAT project should be mindful that in some contexts, methodological choices for the economic assessments of transport options currently might favour supporting policy makers in avoiding investments into active transport, as it might not yet been seen as a desirable form of transport. Therefore, metrics and methodologies should be selected that support balanced results across all modes rather than disfavours active transport (which the VSL does).

In conclusion, participants adopted **recommendation no. 3 to conduct a dedicated discussion with experts working in the area of VSL to address the open issues**. They also decided to defer the discussion of and decisions on all aspects 1-5 above to a dedicated follow-up expert meeting (ideally to take place before the summer break), including:

- use of the Gross National Income (GNI)
- use of prices in USD-MER (dollars in market exchange rates) / prices in USD-PPP (dollars in purchase power parity)
- best approach for the benefits transfer formula (incl. spatial and temporal transfer, income elasticity levels, country income level assignment etc.)
- guidance on ways to better present and explain VSL-based results taking into account limited economic expertise of most HEAT users. This would be the basis for user guidance on "How to explain HEAT economic assessment to key audiences".

In addition, follow-up work should be carried out to look into metrics currently most used by transport / urban planners in terms of usability to derive an economic assessment as well as comprehensibility. Depending on the results, in the future the use of additional metrics (next to VSL and number of deaths averted) could be considered.

3.4 Data entry options for global use

Thomas Götschi, member of the HEAT development team (University of Oregon, School of Planning, Public Policy and Management) explained that when pilot-testing the HEAT global prototype version, to address the potential lack of background data available on some values used for the HEAT calculations, additional data entry options had to be developed, namely for:

- air pollution exposure data
- cycling and walking crash risk data
- population size data

It was recommended to adopt these new data entry options, considering that the applicability of the HEAT on the global scale depends on allowing users to enter background data on air pollution exposure or cycling or walking crash risk where no default values are available (which is not possible in the current version of HEAT 4.0). They also adopted the new way to derive the correct population size number increases usability of the HEAT also in the European context.

In general, participants adopted **recommendation no. 4 to include the new data entry options for air pollution, cycling and walking crash risk data and population size data**. They acknowledged that the new options would merely allow users to consider existing background values or enter their own data.

At the same time, concerns were raised that locally derived walking or cycling fatality rates might be particularly prone to being inaccurate due to the differential underreporting of fatalities by travel mode as well as the limited information on the local volumes of walking and cycling, among other reasons. While the impact of the HEAT crash module is usually minor in comparison to the benefits from physical activity, this difference is likely smaller outside the European context. Ideally, example rates and guidance on suitable fatality rates should be provided for different contexts to avoid under- or overestimation of effects. Participants also recognized the scarcity of data in this area, hampering the provision of a comprehensive list of background data or a wide range of examples for comparison. This was identified as another area for further development, for example aiming at integrating local data collection efforts, such as currently ongoing in Latin America within the framework of the SALURBAL project.

3.5 Future HEAT user interfaces for different user groups and integration of bike sharing

Thomas Götschi outlined that HEAT currently is available in one version to serve all users. However, a “one size fits all” HEAT tool may be too complex for some users, while overly restrictive for others. Some of the existing modules of the HEAT tool (e.g. data adjustments page) have proven to be challenging and time consuming for users less familiar with the tool or with this type of assessment. At the same time, what the “simplest to use” interface looks like is hard to define, as it depends strongly on users’ intentions, data availability, and skills. As such, an “oversimplified” interface can be just as burdensome to use for some as an overly complex one.

Therefore, it was recommended to pursue the development of a “slim” and a “full” interface version of the HEAT, and to add a use-case option “bike sharing” to the “full” interface.

There was clear support for a tool interface that caters for the user's familiarity with HEAT, as interaction with users has confirmed the impression that the current version was often perceived as too detailed, asking

questions that were hard to answer by inexperienced users. While some participants favoured offering a “flex” version with “advanced” options at several stages of a HEAT assessment, others felt this might be burdensome to users and that, in addition to the “advanced” options at several stages of a HEAT assessment, the tool could have an initial page asking their preference for a “slim”/”basic” versus “detailed”/”advanced” at the beginning, in order to void users needing to decide several times which level of complexity they preferred. Participants also agreed that communications needed to ensure that users understood that there was only “one HEAT” (with differing details in its entry options) and that the methodological approach, scientific robustness and underlying default and background data would be exactly the same regardless of which pathway was selected (as long as default options were not changed). Some participants also argued that the “One HEAT” concept might be understood more easily by avoiding an initial selection of user interface experience into different interfaces (and the need to name them differently, with the risk of one being perceived as of being of “lower quality/reliability” than the other) and by offering “advanced”/”detailed” options at various steps instead. Conversely, some participants also pointed out that the “advanced options” as well as the option to change the user interface experience at the beginning is already implemented in the tool currently through an upfront question affecting the interface offered to the user (i.e. with or without a feedback mode), noting that that upfront decision has a smaller impact in the tool as it does not affect data inputs and calculations. It was also highlighted that the decision on how to best adapt the HEAT interface to cater for different users will also depend on technical feasibility, which remains to be determined in the further implementation. Which of the current assessment steps should be hidden for inexperienced users will be determined in close exchange with the HEAT Advisory Group.

No comments were made regarding adding a use-case option “bike sharing”.

In conclusion, **recommendation no. 5 was adopted to pursue the development of different user interfaces with varying degrees of detail** (including as options a “slim”/”basic” pathway, a “flex” pathway offering additional detail at various points in an assessment, and a “detailed/advanced” pathway with all entry options shown upfront), while maintaining the notion of providing one common HEAT assessment approach, and **including a use-case option “bike sharing” in an appropriate place.**

3.6 Proposal to integrate e-biking

Francesca Racioppi introduced this topic by outlining that e-biking is increasingly popular. Evidence is increasing that the use of e-bikes increased the frequency and duration of cycling compared to conventional cycling, that it may help overcome barriers associated with conventional cycling and that e-bikes are providing substantial health benefits through physical activity, but at the same time pose more issues in terms of risk of injuries. While more research into the best possible methodological approach would be following, it was

recommended to participants to adopt pursuing the development of an e-bike use case, and incorporate e-bike considerations across the tool's modules, including for carbon emissions.

Overall, participants **supported the recommendation no. 6 to start a development project to integrate e-biking** into the HEAT. A suggestion made was to consider a slider for the share of e-bikes within overall cycling (and bike sharing as well) as input data may not always distinguish between them, e.g. when assessing a new bike path using count data. In addition, development should consider distinction between pedelecs (with electric support up to 25km/h) and e-bikes (offering support up to 45km/h) and adequate terminology to avoid confusion with e-motorbikes (with no pedalling effort needed), which in some places can be misunderstood as e-bikes.

3.7 Global rollout and dissemination strategy

Thiago Hérick de Sá introduced elements used in the past to disseminate and keep track of use of the HEAT, including the website itself, case studies, webinars and more informal approaches involving a range of experts. The launch of HEAT 5.0 core functionalities by the end of 2021 past this Consensus Meeting, and the potential expansion in the tool's audience serves as a unique opportunity to further disseminate the tool and gather inputs for its successful global rollout. For the dissemination and rollout of HEAT version 5.0, a coordinated approach is planned, which spans a wide range of possible efforts across multiple levels, including:

1. immediate improvements to the tool's user interface as discussed in previous chapters
2. improvements to the tool's website
3. gathering inputs by users
4. the development of a toolbox of support materials for training and capacity building activities
5. pilot testing delivery strategies for country support
6. outreach activities.

One important aspect is to continue to ensure a fairly systematic overview of the rollout and dissemination of HEAT through tracking of HEAT-related activities as well as maintaining and sustaining a network or "community of practice" of key contacts, supporters and users of HEAT. Consensus meeting participants were invited to provide feedback to these elements and to indicate further options for collaboration and synergies.

Participants welcomed the foreseen activities. As an additional option, a stakeholder mapping was suggested (taking into account NGOs and activists, next to transport planners, health and physical activity promoters and climate change policy makers), taking into account current activities underway in all WHO Regions to gain a better understanding of user capacities, interests and data availability. Expanding the selection of case studies with examples from other world regions was also mentioned. Several participants conveyed an interest into other language versions of the HEAT (e.g. Spanish, Portuguese). In this regard, technical feasibility to support

translation needed to be ensured first, and experiences from translations of other WHO tools could be taken into account (demonstrating high resource needs and mindful timing of updates). Promoting HEAT as part of WHO's core tools was highly welcomed to promote its use in different world regions and through the many entry points for action offered by the tool (e.g. transport, environment and health, climate change, NCDs risk factors (physical activity and air pollution), road safety). While some participants suggested that the acronym "HEAT" might hamper its use on a global scale (with heat having a negative connotation related to climate change and high temperatures, or being possibly confused with another WHO tool with the same acronym – Health Equity Assessment Tool), it was concluded that changing a well-known brand such as the HEAT has built over the last decade would require careful consideration and substantial resources. Therefore, this consideration should be carried forward in the future developments of the HEAT work, also informed by the feedback of users.

In addition, a number of participants expressed the willingness to support the rollout and dissemination efforts, e.g. with regard to webinar series, the collation of case studies or the use of local resources to facilitate translation.

3.8 Next steps and other items

The following next steps were agreed by the participants:

- complete the discussion on the economic valuation methodology in a dedicated expert meeting
- draft the meeting report, to be shared over the next weeks with participants for comments and inputs
- incorporate the meeting recommendations into the tool, to the degree resources and technical feasibility allow, and update the HEAT manual and supporting materials
- launch the updated HEAT version on a suitable occasion towards the end of 2021
- identify opportunities for dissemination in the short term and advance on the development of the dissemination and rollout activities
- follow up bilaterally on several ideas, proposals and kind offers of support; and inviting participants, to reach out to the HEAT coordinating team to follow up on interests and ideas.

4 Closing

Francesca Racioppi thanked the participants for their great expertise and most useful inputs, inspiration and offers of support. The discussions demonstrated the usefulness of the HEAT while at the same time putting the weight of responsibility onto the HEAT core team to respond to the high expectations. This will also depend on the availability of resources, and thus fund raising will continue to be a key element of success for this project, which so far depended entirely on resources made available to the HEAT coordinating team and the WHO. She also thanked the chair for facilitating fruitful discussions and for the excellent time keeping

Thiago Hérick de Sá also extended warm thanks to the HEAT coordinating team for the excellent preparations and background work to guide the discussions. He then closed the meeting on behalf of Maria Neira by thanking all participants for their support and comments.

Annex 1 Meeting programme

Tuesday, 29 June 2021

16:00 – 16:15	Logging in, technical checks
16:15 – 16:30	Welcome, overview and aims of the meeting and election of the chair and rapporteur
16:30 – 16:40	Methodology and proposed way of working for the consensus meeting
16:40 – 16:55	Introduction to main developments in HEAT for walking and cycling since launch of HEAT 4.0, 2017 and main discussion topics
16:55 – 17:05	Proposed approach to health impact assessment methodology in HEAT <ul style="list-style-type: none"> • <i>Points 1&2 of the background document (type of mortality rate and long-term physical activity behaviour)</i>
17:05 – 17:45	Discussion of proposed approaches
17:45 – 18:00	Conclusions on the proposed approaches to health impact assessment methodology
18:00 – 18:15	<i>Break</i>
18:15 – 18:30	Proposed approach to economic valuation methodology in the HEAT global context <i>Point 3 of the background document</i>
18:30 – 19:15	Discussion of proposed approach
19:15 – 19:30	Conclusions on the proposed approach to economic valuation methodology
19:30	<i>End of meeting part 1</i>

Wednesday, 30 June 2021

16:00 – 16:15	Welcome and summary of meeting part 1
16:15 – 16:30	Proposed approach to other adaptations of the HEAT – part 1 <ul style="list-style-type: none"> • <i>Points 4-5 from the background document (data entry options for global use, future user interface for different user groups)</i>
16:30 – 17:15	Discussion of proposed approaches to points 4&5
17:15 – 17:25	Proposal to develop other adaptations of the HEAT – part 2 <ul style="list-style-type: none"> • <i>Point 6 from the background document (future e-biking entry option)</i>
17:25 – 17:40	Discussion of proposed approaches to point 6
17:40 – 17:55	Conclusions on the proposed approach to other adaptations
17:55 – 18:10	<i>Break</i>

18:10 – 18:25	HEAT global rollout and dissemination strategy
18:25 – 19:00	Discussion of global rollout and dissemination strategy
19:00 – 19:15	Next steps and other items
19:15 – 19:30	Closure
19:30	<i>End of meeting part 2</i>

Annex 2 List of participants

Invited Participants

Yousaf Ali
Associate Professor
GIK Institute of Engineering Sciences
and Technology
yousafkhan@giki.edu.pk

Elisabeth Belpaire
International Urban and Regional
Planner
+ Board ISOCARP
ISOCARP
elisabelpaire@hotmail.com

Christian Brand
Associate Professor
University of Oxford
Transport Studies Unit
christian.brand@ouce.ox.ac.uk

Ralph Buehler
Professor and Program Chair
Virginia Tech
ralphbu@vt.edu

Alberto Castro
Senior Scientific Collaborator
Swiss Tropical Public Health Institute
alberto.castrofernandez@swisstph.ch

Nick Cavill
Director
Cavill Associates Ltd
nick@cavill.net

Oscar Chamat
Policy and Research Officer
Metropolis
ochamat@metropolis.org

Audrey de Nazelle
Senior Lecturer
Centre For Environmental Policy
Imperial College
anazelle@imperial.ac.uk

Damien Dussaux
Economist
The Organisation for Economic Co-
operation and Development (OECD)
damien.dussaux@oecd.org

Rahul Goel
Visiting Faculty
Indian Institute of Technology Delhi
rahulatiitd@gmail.com

Shifalika Goenka
Professor
Public Health Foundation of India (PHFI)
shifalika.goenka@phfi.org

Dionisio González
Director of Advocacy
International Union of Public
Transport (UITP)
dionisio.gonzalez@uitp.org

Thomas Götschi
Researcher
University of Oregon
gotschi@uoregon.edu

Rogério Gutierrez Gama
Undersecretary of Urban Planning
Prefeitura de Niterói
rogerio.gama@smu.niteroi.rj.gov.br

Holger Haubold
Director
Intellectual Property and Data
Collection
European Cyclists' Federation
h.haubold@ecf.com

Alex Johnson
Head
Department of Transport
Accra Metropolitan Assembly
lexijayson@yahoo.co.uk

Sonja Kahlmeier
Head Department of Health
Swiss Distance University of Applied
Science FFHS
Department of Health
sonja.kahlmeier@ffhs.ch

Paul Kelly
Reader
Physical Activity for Health Research
Centre (PAHRC)
University of Edinburgh
p.kelly@ed.ac.uk

Michał Krzyzanowski
Visiting Professor
Imperial College London,
School of Public Health
mkrzyzan12@gmail.com

Stefan Lambert
Mobility expert
Environment Agency Austria
Umweltbundesamt GmbH
stefan.lambert@umweltbundesamt.at

Christoph Lieb
Expert for valuation methods
Ecoplan
lieb@ecoplan.ch

Ze Lobo
Vice President
World Cycling Alliance
zelobo@ta.org.br

Lucy Mahoney
Senior Manager
Walking and Cycling
C40 Network
lmahoney@c40.org

Victoria Martinez
Environmental Protection Specialist
Federal Highway Administration,
United States of America
victoria.martinez@dot.gov

Leslie Meehan
Director
Office of Primary Prevention
Tennessee Department of Health
leslie.meehan@tn.gov

Gabriel Michel
Executive Secretary
Red de Ciclovías Recreativas de las
Américas
gmichel@iteso.mx

Amanda Ngabirano
Lecturer/Chairperson
Makerere University/National
Physical Planning Board
amanda.ngabirano@gmail.com

Gary O'Donovan
Adjunct Professor
Universidad de los Andes
g.odonovan@uniandes.edu.co

David Rojas
Assistant Professor
Colorado State University
david.rojas@colostate.edu

Harry Rutter
Professor of Global Public Health
University of Bath
hr526@bath.ac.uk

Yahaya Said
Economist
Planning Officer
Ministry of Works and Transport
yahaya.said@mow.go.tz

Alexandre Santacreu
Policy Analyst, Road Safety
International Transport Forum OECD
alexandre.santacreu@itf-oecd.org

Olga Lucia Sarmiento
Professor
Faculty of Medicine
University of Andes
osarmien@uniandes.edu.co

Lucy Saunders
Director
Healthy Streets
lucysaunders@healthystreets.com

Shari Schaftlein
Director
Office of Human Environment
US Department of Transport
Federal Highway Administration
shari.schaftlein@dot.gov

Robert Smith
Epidemiologist
University of Sheffield
rassmith3@sheffield.ac.uk

Tomasz Szreniawski
Independent Programmer
prawdomowca+htzom@gmail.com

Bronwen Thornton
Chief Executive Officer
Walk21
bronwen.thornton@walk21.com

Geetam Tiwari
Professor
TRIP C
Indian Institute of Technology, Delhi
geetamt@gmail.com

Dániel Tordai
Junior Researcher
KTI Institute for Transport Sciences
tordaister@gmail.com

Lan Wang
Professor
Tongji University
wanglan@tongji.edu.cn

Miriam Weber
Senior Policy Advisor
Healthy City Coordinator
City of Utrecht
m.weber@utrecht.nl

Meghan Winters
Associate Professor
Simon Fraser University
mwinters@sfu.ca

James Woodcock
Reader
University of Cambridge
jw745@cam.ac.uk

Masud Yunesian
Faculty member
Tehran University of Medical Sciences
yunesian@tums.ac.ir

UN offices

UNDESA
Julie Powell
Sustainable Development Officer at
Division for Sustainable
Development Goals
powellj1@un.org

UNEP
Carly Gilbert-Patrick
Team Leader
Active Mobility, Digitalization and
Mode Integration
carly.koinange@un.org

UN-HABITAT

Stefanie Holzwarth

Mobility Specialist

stefanie.holzwarth@un.org

WHO Headquarters

Fiona Bull

Unit Head

More Physical Activity

bullf@who.int

Thiago Herick de Sa

Technical Officer; Healthy Urban

Environments, Transport and Health

Department of Environment, Climate

Change and Health

herickdesat@who.int

Meleckidzedek Khayesi

Technical Officer

Safety and Mobility

khayesim@who.int

Pier Mudu

Regional Technical Officer

Department of Environment, Climate

Change and Health

mudup@who.int

Maria Agnes Muriel

Assistant

Department of Environment, Climate

Change and Health

murielm@who.int

Maria Neira

Director

Department of Environment, Climate

Change and Health

neiram@who.int

Cristina Vert Roca

Consultant

Department of Environment, Climate

Change and Health

vertc@who.int

Andreia Santos

Consultant

Department of Health Promotion

santosan@who.int

WHO Regional Offices

AFRO Region

Guy Mbayo

Technical Officer

Climate change, Health and Environment

mbayog@who.int

EMRO Region

Mazen Malkawi
Regional Adviser
MalkawiM@who.int

Heba Adel Moh'd Safi
UNV Technical Assistant
HSafi@who.int

EURO Region/ WHO European Centre for Environment and Health

Massimo Cozzone
Programme Manager
European Centre for Environment and Health
cozzonem@who.int

Francesca Racioppi
Head
European Centre for Environment and Health
racioppif@who.int

Nino Sharashidze
Technical Officer
European Centre for Environment and Health
sharashidzen@who.int

PAHO / AMRO Region

Daniel Buss
Advisor
Climate Change and Health
Bussd@paho.org

Juan Castillo
Air Quality Advisor
castilljua@paho.org

SEARO Region

Hussain Rasheed
Regional Adviser
hrasheed@who.int

WPRO Region

Tom Cole-Hunter
Consultant
colehuntert@who.int

Marco Martuzzi
Head of Office
Asia-Pacific Centre for Environment
and Health
martuzzim@who.int

Genandrialine Peralta
Consultant
Health and the Environment
peraltag@who.int

Shelley Wallace
Technical Officer
wallaces@who.int

Johannah Wegerdt
Technical Officer
Asia-Pacific Centre for Environment
and Health
wegerdtj@who.int