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Urban Green Space and Health: Intervention Impacts and Effectiveness

Report of a meeting
Bonn, Germany

20–21 September 2016

World Health Organization

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Abstract

Interventions on green space in urban settings can help address several public health issues related to obesity, cardiovascular effects, mental health and well-being. However, knowledge on the effectiveness of the interventions in relation to health, well-being and equity is partial. To explore the effectiveness of urban green space interventions to enhance healthy urban environments, WHO gathered European experts on green space and urban planning to discuss approaches and experiences on urban green space interventions. Based on a review of research evidence, a compilation of local case studies and examples of Environmental Impact Assessment/Health Impact Assessment experiences, the expert meeting discussed the variety of green space intervention approaches and their related impacts on environmental conditions, health status, well-being and equity. This report presents the discussion and conclusions on what intervention components have been found to be effective in maximizing the environmental, health and equity benefits derived from urban green spaces.

Keywords

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CONTENTS

Acknowledgement

The meeting was supported by funds generously provided by the German Government through the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

Executive Summary

There is a wide range of international agreements and commitments to enhance and support the establishment of green spaces in urban settings, as these are considered to provide a range of benefits to the urban population. WHO has recently published an evidence review on the health impacts of urban green spaces, providing indicators for the local assessment of green space accessibility. Such indicators enable local authorities and urban planners to assess in which urban areas green space accessibility should be improved, and to establish respective planning decisions.

Yet, little is known on the most effective ways to deliver urban interventions on green spaces, and how to make sure that the environmental, social and health benefits are maximized while potential side effects are prevented or reduced. To explore which green space intervention components work and deliver the best results, WHO held an expert meeting to compile

- available research evidence on urban green space interventions and their impacts;
- local green space intervention case studies and lessons learned;
- existing Impact Assessment experiences on green space planning.

The results indicate that urban green space is a necessary component for delivering healthy, sustainable and liveable cities. Interventions to increase or improve urban green space can deliver positive health, social and environmental outcomes for all population groups, particularly among lower socioeconomic status groups. There are very few, if any, other public health interventions that can achieve all of this, and especially the impact on active lifestyles, mental well-being and social interaction is frequently highlighted as a key benefit. Yet, there is a need for better inclusion of health and equity outcomes in studies on green space interventions, and an improved monitoring of local green space management and related health and equity impacts. Little evidence is also available on unintended side effects of urban green space interventions.

The compiled evidence shows that multidisciplinary and cross-sectoral collaborations help to ensure that urban green space interventions deliver on multiple outcomes and provide a variety of functional opportunities that attract different population groups. Urban green space interventions seem to be most effective when a physical improvement to the green space is coupled with a social engagement/participation element that promotes the green space and reaches out to new target groups (“dual approach”).

Urban green space interventions need to be planned and designed with the local community and the intended green space users. This will ensure the derivation of benefits for the local residents and will aid the delivery of interventions that serve the needs of the community - especially in deprived areas.

As green space interventions need to be considered as long-term investments, they need to be integrated within local development strategies and frameworks (e.g. urban masterplans, housing regulations, transport policies, sustainability and biodiversity strategies). This requires continued political support within local government, and the general understanding that urban green spaces go beyond environmental or ecological objectives and also deliver social and health benefits that increase the quality of life and well-being of all urban residents.

1 Introduction

1.1 Urban green space interventions

In 2010, at the Fifth Ministerial Conference on Environment and Health in Parma, Italy, Member States of the WHO European Region made a commitment *"…to provide each child by 2020 with access to healthy and safe environments and settings of daily life in which they can walk and cycle to kindergartens and schools, and to green spaces in which to play and undertake physical activity*"[1]. Improving access to green spaces in cities is also included in the UN Sustainable Development Goal 11.7 ("B*y 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities*"[2]) and the New Urban Agenda adopted at Habitat III ("*We commit ourselves to promoting safe, inclusive, accessible, green and quality public spaces (…) that are multifunctional areas for social interaction and inclusion, human health and well-being"*[3]*).* Finally, the WHO Action Plan for the implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases in 2012−2016 includes a call to create health-supporting urban environments[4].

In response to these commitments, WHO European Centre for Environment and Health convened an urban green space expert meeting in May 2015 to review the evidence on urban green spaces and health and develop a relevant indicator on accessibility of urban green space. The result of this meeting from 2015 is outlined in the WHO Urban Green Spaces and Health report (published in 2016[5]) providing cities with the evidence on health impacts of urban green spaces and a systematic approach to quantifying and monitoring their green space access. However, the report does not provide information on how to design, implement and manage urban green spaces so that they deliver optimal benefits for urban communities. Understanding how to design and deliver effective urban green space interventions is critical to ensuring that urban green space delivers on its reported positive health, social and environmental outcomes. With this in mind, the WHO Regional Office for Europe has engaged both researchers and practitioners of urban green space interventions in order to interrogate the existing evidence base and supplement it with practical on-ground experience and evidence.

The evidence and case studies compiled in this report were reviewed at an expert meeting in September 2016, for which WHO acknowledges financial support from the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

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[1] Parma Declaration: http://www.euro.who.int/__data/assets/pdf_file/0011/78608/E93618.pdf

[2] Sustainable Development Goals and related targets: https://sustainabledevelopment.un.org/topics

[3] New Urban Agenda: https://www2.habitat3.org/bitcache/99d99fbd0824de50214e99f864459d8081a9be00?vid=591155&disposition=inline&op=view

4 Action Plan for implementation of the European Strategy for the Prevention and Control of Noncommunicable Diseases 2012−2016: http://www.euro.who.int/__data/assets/pdf_file/0019/170155/e96638.pdf?ua=1

[5] Urban green spaces and health: http://www.euro.who.int/__data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1

1.2 Meeting objectives

The main objective of the expert meeting was to explore which urban green space interventions are the most effective at meeting health, well-being and environmental objectives For this assessment, the following three aspects were investigated in detail:

- The evidence base for urban green space interventions and their impacts on environmental quality, health and well-being outcomes, and equity;
- Local case studies of urban green space interventions and lessons learned; and
- The role of impact assessment (Health Impact Assessment (HIA), Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA)) in green space interventions and their impact on the planning process.

Each of these strands of work was prepared by a working paper for discussion at the meeting which will be published in a separate technical WHO report. However, the main outcome expected from the meeting is a brief for urban practitioners and policy-makers on effective urban green space interventions and their delivery, including the potential role of impact assessments in the context of urban green spaces. It is expected that this brief will provide orientation on the effective use of urban green spaces for health and equity objectives, support cross-sectoral collaboration in addressing urban health issues, and enhance capacities of local authorities in shaping healthy and sustainable urban settings.

1.3 Definition of urban green space and related interventions

In the context of this project, and for the use of this report, "urban green spaces" were considered as urban space covered by vegetation of any kind. This includes

- smaller green space features (such as street trees and roadside vegetation);
- green spaces not available for public access or recreational use (such as green roofs and facades, or green space on private grounds); and
- larger green spaces that provide various social and recreational functions (such as parks, playgrounds or greenways).

Some of these larger green space structures (such as green belts, green corridors or urban woodlands) can actually have regional scope and provide ecological, social and recreational services to various urban communities.

"Urban green space interventions" were defined as urban green space changes that significantly modify green space availability and features through

- creating new green space;
- changing or improving green space characteristics, use and functions; or
- removing/replacing green space.

The interventions would have to be implemented in publicly accessible green space, including school yards, private parks and similar settings if they are open to the public.

The use of the term "urban green spaces" should not be considered in conflict with other commonly used terms and definitions, such as "green infrastructure", "green corridors" or "public open space" which tend to be applied in urban and regional planning.

1.4 Outline of the meeting

The two day expert meeting was structured around five working groups and a number of whole-of-group feedback and discussion sessions. The two day meeting programme is provided in Annex 1 and the list of meeting participants provided in Annex 2. Three working papers, based on the strands of work above, were provided to the meeting participants prior to the meeting. Each working paper formed the focus of discussion for the respective working group on the first day of the meeting.

The second day saw two working groups addressing the challenge of integrating health and equity within urban green space interventions. The outcomes of all five working groups were fed into the whole-of-group sessions which worked on the overall key messages and preliminary structuring of the briefing document expected to result from this meeting.

1.5 Meeting documents

Various working and background papers were provided to meeting participants prior to the meeting and were presented and discussed on the first day of the meeting. The description and key findings of the presented meeting documents are as follows:

- The WHO '*Urban green spaces and health*' report[6] published in 2016 reviewed current evidence and outlined the green space and health pathways for which there is strong evidence. The outcomes of this report helped frame the discussion on urban green space definitions, characteristics, pathways and indicators.
- *An evidence review on the environmental, health and equity effects of urban green space interventions* (Working Paper 1) presented a systematic literature review of 38 journal articles by Ruth Hunter, Anne Cleary and Claire Cleland. This paper highlighted that there is promising evidence to support the use of certain urban green space interventions in particular populations. However, for other urban green space interventions the evidence is inconclusive and there is a lack of evidence on the holistic outcomes of interventions where the health, social and environmental outcomes are assessed together.
- *Good practice and lessons learned: a review of green space intervention case studies* (Working Paper 2) summarized quantitative data from 48 case studies and qualitative data from 15 semi-structured interviews which were collected and analysed by Annette Rebmann, Anne Cleary and Matthias Braubach. This paper highlighted the importance of stakeholder collaboration, community engagement, long-term perspective and practical solutions for delivering effective urban green space interventions.

[6] Urban green spaces and health: http://www.euro.who.int/__data/assets/pdf_file/0005/321971/Urban-green-spaces-and-health-review-evidence.pdf?ua=1

- *The role of impact assessments (HIA, EIA and SEA) in urban green space interventions for health* (Working Paper 3) concluded on desktop reviews of 12 impact assessments and seven interviews with impact assessment authors by Thomas B Fischer, Urmila Jha-Thakur and Peter Fawcett. This paper recommended applying a proactive impact assessment approach which combines problem and impact driven elements in an integrated health and environment assessment.

The working papers will be published in a separate WHO technical report on urban green space interventions, together with all discussion and conclusions from the meeting.

2 Working group discussion and outcomes

Each of the three working papers was discussed in their respective working groups (working groups A, B and C) on the first day of the meeting. These working groups compiled expert advice for the finalization of the working papers. On day 2, working groups D and E considered the health and equity aspects of urban green space interventions. The following sections outline the discussion and outcomes resulting from the five working groups.

2.1 Working Group A: Evidence review on urban green space interventions

This working group addressed the findings of the evidence review on urban green space interventions and brought together a range of experts and researchers from various countries. In parallel with the discussion of the review paper, the working group was also tasked with identifying key messages from research work that could be relevant for informing local green space action.

2.1.1 Relevance of urban green space interventions vis a vis their effectiveness

- The working paper concludes that the most promising intervention approaches are (1) park-based interventions combined with social promotion activities, and (2) greening interventions (such as street trees, greening vacant lots, green infrastructure for water management).
- There is inconclusive evidence on the effectiveness of some urban green space interventions (e.g. park-based interventions involving only a change to the built environment, urban greenways and trails, or pocket parks). This is partially affected by a limited number of intervention studies carried out, and inadequate evaluations that do not provide data on health or equity outcomes.
- In light of the methodological limitation to intervention studies with a pre-post design, and acknowledging that cross-sectional and observational evidence suggests green spaces to have strong benefits for health and equity, the working group agreed that all kinds of urban green space interventions should be considered on local level to provide a diversity of green spaces that are accessible and usable for various population groups.
- Considering the evidence when planning interventions may provide opportunities to strengthen the intervention design by applying intervention components that are most

promising. Yet, intervention types with inconclusive evidence should still be considered and their impacts should be monitored to provide better information on their effectiveness.

2.1.2 Urban green space intervention outcomes

- The intervention outcomes assessed are dependent on the specific objectives of the intervention, most often there are various or different expected outcomes. Given the range of urban green space interventions included in the review, it is not appropriate to directly compare different outcomes across different intervention approaches. Also, urban green space interventions are context-specific, resulting in different outcomes in different settings with differing populations.
- Urban green space interventions have the potential to affect a range of outcomes including the exposure to environmental risks, lifestyles and behavioural aspects, health and well-being, social equity and quality of life in general. For monitoring and evaluation of urban green space interventions by local practitioners, usage of urban green space should be considered a suitable proxy measure of success even though health aspects etc. may not be directly covered. The working paper employed a systematic review methodology and included studies of at least modest quality (i.e. pre-post intervention or controlled post-intervention measurement). The relatively limited number of eligible studies per intervention category indicates that there is further need for high quality green space intervention research and the academic evaluation of natural experiments in order to add to this evidence base.
- Observational and cross-sectional research suggests a wider range of outcomes and associations with urban green space that were not covered by the included studies but can help to inform local practice.
- Overall, urban green space interventions can represent powerful opportunities for public health as they have the capacity to provide a wide range of environmental, social and health benefits. Even though the available information does not allow to quantify the extent and magnitude of these benefits for different intervention approaches, the expert group acknowledged that there is little evidence for other infrastructural interventions to provide a similar diversity of potential benefits as green space interventions do.

2.1.3 Good practice and design

- The evidence on urban green space interventions and their outcomes informs many professionals – such as urban planners, green space managers, landscape architects, medical practitioners, public health professionals, community safety officers – as well as the local community groups engaged in urban sustainability and health protection.
- Good practices derived from the urban green space intervention review with relevance for local action were:
  - Early engagement with user groups and the local neighbourhood community to assess their needs and demands (and to potentially inform evaluation procedures)
  - Targeting intervention activities to specific population groups (such as children, elderly people or people with different cultural background) or urban areas can be very relevant, but requires good knowledge on what specific community groups need

    - A multidisciplinary team is needed for adequate designing, planning and managing of the urban green space interventions
    - The intervention review suggests dual approaches including both physical changes to the urban environment, and promotional/engagement activities
    - As urban green spaces develop overtime, long-term perspectives are needed for both maintenance and management, and the respective funding
- Interventions should be based on the needs of the area (e.g. flood risk management, children's play) which should guide the type of intervention, the function of the green space, and the type of vegetation applied.

2.1.4 Evaluation

- Evaluation of urban green space interventions is necessary to better understand its consequences, assess whether it has achieved the objectives set, and identify whether all population groups benefit equally.
- It is essential to plan evaluation from the outset of the intervention, including baseline data collection to compare the intervention effects. Evaluation activities must be budgeted from the beginning as well, with a suggestion of ca. 10% of the total budget.
- As urban green spaces may need time to develop, and local communities may use such areas increasingly over time, evaluations should cover at least a two year period after the intervention is implemented.
- The evaluation of outcomes must match the scale of the project and be realistic regarding expected outcomes, changes and data availability. Often, local practitioners benefit from quantitative data and it is helpful to consider early in the process what quantitative data could be obtained with reasonable effort. The use of routinely collected statistical data on local level should be maximized. Yet, the use of other types of arguments and measurements to complement the quantitative data is necessary to avoid that the lack of quantitative data is interpreted as a lack of evidence in general.
- The urban green space intervention studies reviewed were almost exclusively published by academic institutions. Local practitioners and authorities should therefore consider approaching (or teaming up with) academic institutions when planning an intervention to discuss data collection, potential funding opportunities, and methods for robust evaluation etc.
- The quality of evaluation often depends on funding requirements which may focus on a narrow range of outcomes or require an evaluation report within a short time frame. This may limit the overall value of evaluation work and potentially underestimate the intervention benefits.
- It is important to consider evaluations as a means to improve and further develop urban green space interventions. Pioneering and innovative interventions may not achieve their expected objectives immediately but as interventions develop, lessons are learnt.
- The role of citizen science and participatory research in evaluation should be considered. This may aid data collection and evaluation, and would also help to increase the active uptake of the interventions.

- Given the range of urban green space interventions, and acknowledging the different functions green space provides to different population groups, evaluation should not only investigate population-level outcomes but also consider specific impacts for specific groups – especially disadvantaged or underserved target groups.

2.1.5 Risks and unintended side effects

- None of the included studies measured harms, adverse effects or unintended consequences (for example gentrification processes, property damage and health and safety considerations such as fear of crime, falling branches or injuries in general, anti-social behaviour, allergenic pollen, vector borne disease or overexposure to sunlight). However, such unintended side effects can, in most cases, be prevented or strongly reduced through good design, planning and practice. Multidisciplinary approaches throughout the process help to ensure that unintended side effects are identified and dealt with appropriately.
- Another unintended impact of interventions may be the unfair and unequal distribution of benefits and risks between different population groups (e.g. socioeconomic, gender, age). Such unintended effects should be documented as part of the evaluation process to inform future interventions.

2.1.6 Priority areas for further research

- Compared with the body of evidence on green spaces and health based on observational and cross-sectional studies, there is a limited but growing evidence base investigating the impacts of urban green space interventions. Yet, more research on urban green space interventions and how to reach "hard to engage" target groups is needed.
- A key question for research, with high practical relevance for local planners, is the required dose of and exposure to urban green space – what is the minimum amount per person required, and what is the ideal type of urban green space?
- Multidimensional evaluations are needed to cover the many outcomes of urban green space interventions, with a special focus on health and equity aspects.
- The development of alternative and innovative evaluation methodologies (e.g. application of realist approaches – 'what works, in which circumstances and for whom?') would be useful to enable appropriate evaluation on the local level. In this context, it would also be relevant to ensure that studies are measuring net benefits and not potential displacement effects.
- Practical research to help municipalities choose between urban green space interventions based on the evidence and outcomes would provide useful guidance for action.

2.1.7 Funding of green space research

- Funders need to become more aware of the relevance of urban interventions in general, and especially the impacts of green spaces. When funding green space interventions, the budget should enable robust evaluation studies to inform further work and prevent negative outcomes.

- Urban and green space interventions often fall between disciplinary boundaries and therefore need multidisciplinary funding streams.

2.2 Working Group B: Local action and city examples on urban green space planning and implementation

This working group brought together the expertise of several urban green space practitioners to review the key findings and conclusions as outlined in the accompanying working paper. The group revised the four conclusions on good practice components (stakeholder collaboration, community engagement, long-term thinking and practical considerations) and developed them into nine good practice components. These apply mainly to larger green space interventions such as parks or greenways and may be less applicable to smaller interventions (e.g. the provision of street trees or the construction of green roofs or facades).

2.2.1 Good Practice Component on "dual approaches" – incorporating physical features and engagement activities

- All urban green space interventions should apply a dual approach where physical changes (e.g. creating new or improving existing green space) are accompanied by social changes (e.g. social activities and programs to promote the green interventions). Social activities can be diverse and may occur at all phases of the intervention (e.g. design, implementation and evaluation phases), these include aspects such as:
  - community participation in the design or implementation phase of the intervention or in the green space maintenance post-implementation
  - facilitated activities within the completed urban green space intervention, for example, family days, festivals and markets or smaller scale group activities such as guided walks, which can be particularly effective for engaging with underrepresented user groups of green space.
  - promotion of completed urban green space intervention through park web site, onsite signs etc..

2.2.2 Good Practice Component on stakeholder collaboration

- Develop, with the community, a clear vision that can be shared and supported by all stakeholders, including politicians.
- Support key actors within local organizations and sectors to carry out the role of advocacy for urban green space interventions.
- Secure leadership among decision-makers for the urban green space intervention.
- Create diverse, multidisciplinary and cross-sectoral collaborations to ensure that urban green space interventions are integrated within both urban planning and health sectors and are designed and delivered with multiple outcomes in mind.
- Work with academic institutes and research centres, where possible, in order to aid effective monitoring and evaluation of the intervention.

2.2.3 Good Practice Component on community engagement

- Engage with the intended users when designing and developing the urban green space intervention. Not designing for people, but designing with people. This requires that all local residents have access to information about a potential intervention project and have the opportunity to participate and engage in the project design.
- Support local champions to advocate for and promote urban green space as well as to help with engaging the local community.
- Local municipalities need to be clear and firm in fulfilling their responsibility of providing adequate green space access for all urban residents. Hence, community engagement is carried out in order to help decide how the urban green space intervention should be designed and delivered, enabling municipalities to take informed decisions reflecting the needs of the community.
- Continuously communicate with the community in a clear and effective way that includes building their environmental awareness and knowledge of the environmental characteristics and roles of the urban green space.
- Engage children and young people with the urban green space as they are the future user and carers of the urban green space.

2.2.4 Good Practice Component on place-making and creating identity

- Allow for the distinctive and unique character of the green space to be expressed within the design. Where possible, acknowledge within the design the local characteristics and historical and cultural setting of the green space.
- Create a sense of purpose and identity for (different parts of) the green space. This can come from engaging with the community during the design phase and/or through applying place-making principles.
- Provide opportunities for meaningful activities to be undertaken within the green space. These meaningful activities will be dependent on the needs and demographics of the users and could range from providing facilities for urban gardening to providing areas for social interaction or areas for relaxation and reflection.
- Too much planned design of public spaces may increase the risk that the green spaces end up being to “structured”, leaving too few surfaces open to activities that could not be foreseen. Urban green spaces should therefore incorporate open spaces for new functions that may evolve.

2.2.5 Good Practice Component on long-term perspective

- Have a long term perspective (various decades and up to 100 years, depending on the green space component) when planning, designing and implementing urban green space interventions.
- Design the urban green space to be adaptive and manage it in a dynamic and flexible way. The demographics and needs of the community and how they interact with and use the green space may change over time, and the intervention needs to be able to cater for this change.

- Embed urban green space objectives within formal planning, financial, health and other relevant frameworks and plans.
- Continue to promote, develop and improve the urban green space even after implementation. Laying the last stone is not the last step, it is the first step – urban green space interventions are long-term commitments.

2.2.6 Good Practice Component on planning and design

- Avoid focusing major investments on one or very few green spaces only, as the demand placed upon them may be to the detriment of their quality and the benefits they provide. The same may happen if too many functions are embedded in an urban green space setting that does not provide the necessary size or quality, leading to potential conflict between users and functions.
- Design the urban green space intervention within the context of the whole urban area and surrounding environment. For example, consider the connectivity of the intervention with other green spaces (e.g. green trails or biodiversity corridors) and urban destination points (e.g. city centre or local points of interest).
- Avoid species of trees or types of vegetation that are known to produce allergenic pollen.
- Be practical in the design of urban green space interventions. Sometimes practical changes that enhance the access (e.g. improved entrances and paths) and use (e.g. resting areas, trail way-finders) can be highly effective and cost-efficient for improving use of the green space.
- Consider the role that the urban green space plays in delivering ecosystem services such as flood mitigation and climate change adaptation and how the green space can be designed to help optimize these services and avoid unintended consequences.
- Consider how seasonal variation will negatively affect the use of the urban green space and integrate design features to mitigate this. For example, having adequate lighting for reduced daylight hours during winter or adequate drainage from paths during the wetter seasons.
- Be diverse in the provision of urban green space interventions. Urban communities are a complex combination of diverse cultures and subgroups all with varying needs. Hence the type of urban green space as well as the uses and activities provided for within these spaces needs to be diverse reflecting the make-up of the local communities.
- Consider the cultural and historical context of the urban green space. Where possible, acknowledge through the design any unique local historical and/or cultural significance of the site.

2.2.7 Good Practice Component on accessibility

- Ensure that the urban green space is physically accessible so that it is, for example, within a short distance of local residences[7], has obvious and safe entrance points and is accessible via safe and pleasant walking routes (e.g. not having to walk across busy roads or through dangerous areas).

[7] Often, a 5 minute walk or a distance of up to 300m are defined as an acceptable distance.

- Access to green and public spaces should be free of charge to enable active use by all.
- Ensure that the urban green space is socially accessible so that it feels welcoming and inclusive for all community subgroups.
- Ensure that the green space is designed for universal access, for example, with wheelchair friendly access points and trails and braille information signs.

2.2.8 Good Practice Component on maintenance

- Manage and maintain the urban green space so that users perceive it as safe, clean and cared for. For example, ensure bins are provided and not left to overflow. Negligent management and maintenance which can encourage anti-social behaviour.
- Implement maintenance measures that will increase safety and deter anti-social behaviour. For example:
  - Manage vegetation so that it doesn't block the line of sight on pathways or doesn't block the view of security cameras.
  - Implement anti-vandalism measures such as anti-graffiti paint on art installations.
  - Be persistent with combating vandalism. Fix vandalism (e.g. burnt park bench) as soon as possible. This helps to show local community that the space is cared for and that such negative behaviour is no longer acceptable.
  - Consider ´Crime Prevention Through Environmental Design´ principles.
- Encourage responsibility and ownership among users by involving them in the maintenance of the urban green space. This should be done in collaboration with the organization responsible for the urban green space so as to avoid any potential liability issues/disputes.
- Consider maintenance requirements during the design phase and use maintenance-friendly design that won't result in expensive and/or complex maintenance requirements.
- Use ecological maintenance which can help to reduce the use of chemical agents (e.g. pesticides) and associated adverse health impacts.
- Successful green space policies and interventions can lead to increased use of the green spaces. To avoid degradation of the green areas, such increased use should be planned for and maintenance work may need to be adjusted accordingly.

2.3 Working Group C: Health Impact Assessment and Environmental Impact Assessment action

The task of the working group presented a uniquely challenging question to look at the implementation of Health Impact Assessment (HIA), Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) and their overlap with urban green space planning, and how it may be applied as a tool for improving environmental health and social benefits. The objective of the working group was to discuss working paper 3on the role of impact assessments in urban green space interventions in detail with a focus on its conclusions, identify missing elements, and derive or confirm key messages and recommendations. The following paragraphs provide a summary of the discussion.

2.3.1 Identifying good examples

The working paper indicated that the task of identifying good examples for the role of impact assessments (HIA, EIA and SEA) in urban green space interventions for health was challenging – mostly because it was not always possible to identify a neat overlap of these various components. As a starting point, the paper presented a typology reflecting different types of documents which label themselves as HIA. The applied typology was insightful in reflecting on a range of practices that are much deviated from the original definition of HIA. Hence the working group dedicated much effort on the typology provided which led to the following findings.

- Health is often a fuzzy, broad concept and many of the reviewed impact assessment projects are examples of advocacy documents (they make the case for health), thus they are no real impact assessments but rather represent examples of 'Health in all Policies' approaches;
- There is a need to redefine HIA and distinguish between those cases which are examples of HIA (as commonly understood) and cases representing 'health in all policies';
- Future research should go beyond identifying good practices through internet search engines and investigate beyond impact assessment reports. This is especially because it was difficult to locate good examples of the overlapping concepts through search engines. Furthermore, the findings of this paper were dominantly based on the IA reports and therefore could not reflect on the procedures and communications that preceded them.

2.3.2 Closer integration of HIA and EA

- Based on the practices that were looked at on HIA, it was realized that HIA served more as a communication and advocacy tool. This had its own merits but the need to actually look at specific impacts was undermined as a consequence.
- The environmental assessments did mention health and green space but the relation was more implicit rather than explicit. Generally speaking green space interventions were usually associated with activities related to cycling, walking paths or cleaner air. Though generally speaking these are associated with enhancing health, the reports didn't further elaborate on how such enhancement would lead to better health or such a relation would be monitored.
- Many of the reported impact assessment projects included both health impact and environmental assessments but on closer inspection revealed that these assessments are not integrated or connected. Following on from the two previous points, it was therefore felt that health impact and environmental assessments could be used to complement each other. However, more research is needed to explore how a meaningful integration can be done.

2.3.3 Monitoring

- The HIAs served more as advocacy tools and therefore monitoring was a deficient component in these. HIAs could play a more effective role in future by actually assessing impacts of the activities and including a monitoring plan within.
- With regards to the environmental assessments for the purposes of routine monitoring: where particular health pathways are well established it may be satisfactory to monitor these

pathways or determinants (e.g. physical activity levels), rather than monitor specific health outcomes (e.g. obesity). Future longitudinal research is needed to explore direct evidence (for example, construction of a park will lead to measurable increase in life expectancy).

- The discussions further recognized the need to position 'people' at the heart of the monitoring, for example, focus should not simply be on monitoring green space usage but also on understanding which user groups are using (and not using) the green space (equality and equity).
- Monitoring and follow-up activities are usually challenging in the long run due to inadequate funds. Innovative approaches need to be devised engaging user groups to enhance ownership and duration of these activities.

2.3.4 Enhancing the role of impact assessment

- The difficulties for identifying good examples of urban green space interventions within impact assessments was also attributed to the limited role that impact assessments were playing. Most of the time, impact assessments are being used as a tick-box exercise only adding moderate value to the planning issues regarding green space and health. The interviews conducted as part of this study further revealed that there is a lack of ownership of the impact assessments conducted, for e.g. they were usually prepared by third party consultants.
- Time constraints were identified as a major factor for planners as well as consultants which refrains them from presenting a refined version of the impact assessment reports. For planners, impact assessment is only a part of the bigger picture and therefore, they may feel less inclined to focus on it. Furthermore, in attempting to contact people who were involved in the preparation of the impact assessments, it was soon realized that the institutional turnover was high and most people had left their positions. This made it difficult to gain a better insight into the impact assessment process. Based on these experiences the working group felt that dedicated people were required for the environmental assessments.
- Furthermore, some awareness needs to be created in terms of how health considerations can be taken into account and related with the greening interventions. It was concluded that the impact assessments studied do not necessarily make the most of the methodologies that may be available for developing evidence and monitoring these.

2.4 Working Group D: How to integrate health aspects in urban green space interventions?

This working group was brought together to discuss how best to integrate health aspects into urban green space interventions across all stages of the intervention, namely, the planning, implementation and evaluation phases of the intervention. A key recommendation from this group was the need to communicate the simple green space message first and foremost. This led to the suggestion for the development of a simple one-page mandate for policy and decision-makers on urban green space health benefits.

2.4.1 Integrating health during the planning phase

- Integrate green space objectives within the relevant frameworks – the first step of planning urban green space interventions is to ensure that green space is integrated into and supported by the relevant frameworks. Existing tools, such as impact assessment, can be used as a way to achieve this. The following considerations can also aid the integration of green space objectives within relevant frameworks:
  - *Build relationships and collaborations* – Invest time and effort to build effective relationships and collaborations with key actors and organizations from all the sectors relevant to green space (e.g. urban planning and health sectors).
  - *Understand the key 'decision points'* – Understand the systems and frameworks relevant to green space and identify where the key 'decision points' are within these systems. Focus your effort on influencing and informing these points. For example, integration of green space may start by informing key components at the master plan level and hence could take years before the on-ground outcomes are realized. For this, it is also important to involve as early as possible the local actor or division that will be responsible for creation and maintenance of the green space.
  - *Communicate effectively* – The simple message of green space health benefits should be communicated clearly, consistently and concisely across all relevant sectors and with all relevant stakeholders.
- Think broadly – The literature reports on positive health associations for a diverse range of intervention types such as street trees, green space establishment on vacant lots and greening school playgrounds. Hence, it is important to think 'beyond parks' when planning urban green space interventions. This broad thinking may present opportunities for collaboration with institutes such as schools, universities and health services which may enable access to relevant data sets and help with informing the design of the intervention. Also, broader interventions (such as urban extensions, large infrastructure projects or masterplans for residential areas) could consider and include urban green space and be informed by the benefits of such provisions.
- Identify the pathway – It is important to understand the aims and objectives of the intervention and to clearly identify the pathway through which the intervention aims to achieve its main expected outcome. This understanding will help identify relevant indicators for establishing the baseline data for the intervention. For example, if the intervention aims to deliver improved physical health among local residents then indicators such as Body Mass Index and current levels of physical activity among local communities would be relevant health baseline data for informing the intervention.
- Consider existing, routinely collected data sets – When considering relevant data for informing the planning and design of the intervention, think first of existing data sets and how these might be utilized. Some national or local municipality surveys may already have baseline information on how people currently use and value local green spaces.
- Understand the local demographics – Good demographic data on local residents and intended users of the green space is critical for informing the planning and design of the intervention. The size, quality and functions of urban green space and features, and the types of amenities provided and activities facilitated within green space, should reflect the make-up and needs of

the local community. For example, safe social engagement areas for older population groups (e.g. boules court) or creative and active spaces for younger groups (e.g. skate parks). Dog-ownership is another key demographic consideration for green space users.

- Understand the user – All the needs of the varying community subgroups need to be captured. Qualitative data, such as interviewing the intended users of the intervention, is a good way to gain understanding of these needs. Various techniques can be used to collect these data such as using maps during interviews to gain a robust understanding on how people use and move in and around local green space.
- Collect fit for purpose data – Efforts and resources invested in the baseline data collection should be proportionate to the scale and priority of the intervention being implemented.
- Resolve user conflicts – Given the varying needs and uses of green spaces among diverse local urban communities, as well as visiting users (e.g. tourists), it is common for conflicts among users and competition for space to arise. This should be considered at the planning phase and tools such as local community forums and engaging with local 'on-the-ground' organizations and networks can be used to address these potential conflicts from the start. This will also be a good way to collect data from community on their needs and expectations of the intervention. It is important to note that it is unlikely that all expectations will be equally satisfied.

2.4.2 Integrating health during the implementation phase

- Identify potential adverse outcomes – It is important to think about possible negative effects beforehand and then monitor accordingly to see if the intervention results in these adverse outcomes. Although difficult to monitor for, it is also important to be mindful of potential unexpected negative outcomes and implement strategies to try and identify these.
- Community feedback systems – During implementation issues can arise (e.g. disturbance to local community). There needs to be some kind of complaints or feedback system with the community to ensure that such issues can be promptly identified and effectively resolved.

2.4.3 Integrating health during the evaluation/assessment phase

- Evaluation efforts should be proportionate to the scale of the intervention – Costly before-after, control-impact evaluation designs or epidemiological studies may not be supported by the local authority owing to resource constraints. Some large scale interventions implemented in priority areas may receive support for such monitoring programs but mostly it will be important to be practical and fit-for-purpose when designing the intervention's evaluation.
- Evaluate the identified and targeted pathway(s) – The evaluation should be measuring the effectiveness of the pathway targeted by the intervention. The pathway should be identified during the planning phase and the intervention designed to specifically target that pathway.
- Be realistic – Within limited resources only certain data can be collected (e.g. observational count data on use). If there is a need to understand more complex relationships such as physical activity displacement then commitment of time and budget is required.

- Consider the non-users – In addition to monitoring the use of the green space and satisfaction among users it is also important to collect data from people who aren't using the green space and to understand what the related barriers are.
- Practical tips – A number of tips for effective indicators and relatively simple data collection methods were identified by the group as follows:
  - Use observational data of green space use as a relatively simple and cost-efficient way to assess how many people are using green space, what types of people are using it, who they are using it with and for what purposes.
  - Use existing audit and observational tools to collect information on play and recreation in public areas.
  - Consider simple and innovative monitoring techniques (e.g. user satisfaction counters like seen in public facilities).
  - Engage with local networks and organizations as a way to collect feedback from community and green space users (e.g. engage with community councils or watchdog committees).
  - Ensure that monitoring is considered from the start and that budget is allocated.
  - Collaborate, where possible, with academic institutes and research centres which can aid with delivering effective monitoring and evaluation for the intervention as well as cost-efficient monitoring (e.g. through developing student research projects around the intervention).
  - Consider proximity and accessibility of the intervention with regards to local residences, particularly in the context of park-based interventions.

2.5 Working Group E: How to integrate equity aspects in urban green space interventions?

This working group discussed how social aspects and equity considerations can be best embedded in the local action on urban green space. Specific consideration of equity aspects is important to

- assure that all population groups have access to, and benefit equally from urban green space,
- avoid that unintended effects occur for specific groups, and
- identify unintended side effects on equity and social cohesion as early as possible.

The group discussed the implementation of equity aspects for the planning, the targeting, and the evaluation of the green space interventions.

2.5.1 Integrating equity aspects in the planning of urban green space interventions

- A key issue to be clarified during the planning process is the understanding of "equity" within the planning group and other relevant actors. Different professions may have different perception of equity and equity-related objectives, and it would be useful to develop a common understanding.

- Available equity data with relevance to the urban green space intervention must be compiled and the objectives of the intervention in terms of equity need to be defined. If specific equity objectives are not defined, or no data is available, then no assessment of equity impacts can be carried out.
- Often, socioeconomic status data but also other data (e.g. on environmental risk exposure, age and sex, or ethnic and other sociocultural parameters) are available through standard processes on local level. Such data may often be available for an urban/neighbourhood area rather than as individual data, in such cases the smallest-possible spatial unit should be considered. Understanding the population profile is important to define equity issues.
- Equity considerations tend to look at disadvantages and deprivation levels, but the distribution of local benefits and resources should also be considered to enable an assessment of both needs and resources.
- If data on green space availability and accessibility are available, information on its use and quality could provide useful information to assess potential equity effects of urban green spaces.
- Equity is a concept and it is important to acknowledge that different cities have different starting points and the definition of equity may therefore vary. What matters is that any intervention does not aggravate existing inequity, but instead contributes to reducing equity gaps.
- Community participation – and specifically the involvement of vulnerable or disadvantaged groups – in the planning process may provide an effective way to increase the success of the intervention for these groups and generate benefits to different user groups, and also to avoid social conflicts regarding the future use of the area. The engagement of the community is not an easy task and needs time for understanding and trust to be established. Site visits and proactive approaches using different methods are needed to bring the consultation process to the local community, and language issues need to be considered.
- Engage with community right from the start but be clear that community participation will not lead to each individual expectation being served.
- The use of "local champions" – ambassadors, peers or mediators from local community groups etc. – could be considered to support community engagement particularly among disadvantaged groups.
- Various green space interventions may provide opportunities to actively involve local residents in the building or implementation phase, which would enable the community to influence the outcome and also increases the level of local responsibility and the perception of ownership.
- The new establishment of larger parks and green spaces is often preceded by a design competition. In such cases, it is important that the competition brief includes information on potential equity aspects to be considered for the green space design.

2.5.2 How to target the interventions to reach best equity outcomes?

Urban green spaces should be equally accessible and available for all residents and population groups and this is a basic feature that all urban green space interventions should consider. If

further targeting is required to address and attract specific user groups, it can be done through different approaches:

- Spatial targeting: the intervention is implemented in a selected area where the demand for green space functions is high, or specific outcomes and benefits can be expected. This could be the case in socially deprived areas (where disadvantaged populations reside), in districts with insufficient green space, or in urban regeneration areas (or brownfield developments) where large-scale urban renewal takes place.
- Spatial targeting combined with user targeting: for specific areas with specific demands or needs, respective green space design, equipment and functions can be identified so that the green space would especially attract or benefit certain user groups. In this context, it is important to still enable other functions so that other user groups can also use the green spaces – which will help to avoid social conflicts.
- Target group promotion activities: irrespective of the design and functionality of the urban green space, social campaigns and community events can support outreach and promote the green space within specific target groups. Depending on the local situation, individual aspects and user groups may be prioritized. Yet, it is important to always consider urban green spaces as a local resource for the whole community and not exclude user groups through monofunctional green space design.

2.5.3 Equity aspects in the evaluation/assessment of urban green space interventions

Equity data are very important for monitoring and evaluation to assure that interventions do not have negative or unintended side effects for specific groups.

- Key parameters for the evaluation of equity impacts for specific population subgroups relate to age and sex, socioeconomic status, ethnicity or place of residence. The equity dimensions to be monitored and evaluated depend on the type of survey, the outcomes expected, and the potential target groups that should benefit most.
- A budget for monitoring and evaluation must be clarified before the intervention starts.
- A baseline overview (based on existing data sources or new survey) before the intervention is needed to enable comparison of the situation after the intervention, i.e. the outcomes of the intervention with the situation before the intervention.
- It is difficult to identify unintended side effects in "universal" green space interventions without a specific equity objective. If an intervention is expected to benefit the whole population, equity aspects should still be considered to make sure that such unintended side effects harming a specific population group are still captured.
- Evaluation data is often collected from the persons using the respective green space. However, more interesting from an equity perspective is the question which persons are not using it, and why. The type of data to evaluate the equity effects of urban green space interventions must be considered and selected appropriately.
- Quantitative data and qualitative data provide different type of information on the impact of an intervention. Both types of data are relevant.

- For financial or other reasons, it is often difficult to collect quantitative or measured data on the impacts of intervention projects. Although such data would be often preferred by policy-makers and funders, observational studies and self-reported data can still be useful to document the impact of urban green space intervention projects.
- It is important to make use of local surveys/population statistics and other existing local data sources (from all kinds of different sectors).
- Collaboration with research institutions and universities could provide opportunities for improved impact assessment surveys.
- Citizens and residents can be involved in documenting the impact of local interventions ("citizen science", "lay knowledge").

Fundamental considerations affect and improve monitoring and evaluation of equity impacts:

- Make sure that the planning team has a common understanding of equity
- Have a plan and a separate budget for monitoring and evaluation before starting the intervention.
- Be clear on what will be monitored (and why), and what the respective indicator will be.
- Use different scales (city versus neighbourhood) and different methods.
- Plan for several rounds of evaluation, not just once. Often, it takes time for the intervention impacts to evolve.
- Make use of knowledge of various actors and local agencies to assess the diversity of outcomes.
- Document and disseminate your approach and lessons learned to exchange experiences.

3 Conclusions and next steps

The two days of discussions and workshops proved fruitful for deriving conclusions and key messages on urban green space and the impacts of urban green space interventions on health and well-being as well as social cohesion and equity. Throughout the discussions two aspects were continually highlighted as important considerations for the production of the final project deliverables, namely terminology and target audience. With regards to terminology it was recommended that 'urban green spaces interventions'[8] be clearly defined for the purposes of this work and that it is clearly explained how this definition of urban green space relates to green infrastructure, nature-based solutions, ecosystem services and other relevant terms. With regards to target audience it was highlighted that the type of information and how it is delivered varies across the three levels of policy and decision-makers, practitioners and community. Hence, it is important to clearly understand the target audience of any meeting outputs and tailor these products to effectively communicate to this audience. The meeting participants endorsed the proposal to publish the results of the meeting, together with the working papers, as a technical WHO report. However, the meeting participants also urged WHO to provide a more condensed document targeted at local actors, planners and decision-makers which would summarize the benefits of urban green space and provide practical information about on-ground delivery of effective interventions. A number of draft key messages for communication via such a WHO brief on effective and health-promoting urban green space interventions were endorsed by the whole group. Some of these draft key messages were defined as follows:

- Urban green space is a necessary component for delivering healthy, sustainable and liveable cities.
- Urban green space interventions can deliver positive health, social and environmental outcomes for all population groups, particularly among lower socioeconomic status groups. There are very few, if any, other public health interventions that can achieve all of this.
- Multidisciplinary and cross-sectoral collaborations will help to ensure that urban green space interventions deliver on multiple outcomes.
- Urban green space interventions are most effective when a dual approach is adopted where a physical improvement to the environment is coupled with a social engagement/participation element.
- Urban green space interventions need to be planned and designed with the local community and the intended green space users. This will ensure the derivation of benefits for the local community and will aid the delivery of interventions that serve the needs of the community - especially in deprived areas.

[8] The definition of "urban green space interventions" was: urban green space changes that significantly modify green space characteristics through creating new green space; changing or improving green space characteristics, use and functions; or removing / replacing green space. The interventions are implemented in publicly accessible green space, including school yards, private parks and similar settings if they are open to the public. Urban green spaces in this context are considered as spaces covered by any type of vegetation.

- Urban green space interventions need to be situated within the overall context of the urban area and integrated within the relevant strategies, frameworks and plans (e.g. urban masterplans, health and transport policies, sustainability and biodiversity strategies).
- Good design, implementation and maintenance of urban green space interventions will mitigate any potential adverse outcomes from the intervention.

These draft key messages – along with the outcomes from the working groups, as outlined in the previous sections – will be used to inform the development of the first draft of the "WHO Urban Green Space Intervention brief", as called for by the meeting participants. Meeting participants agreed that the structure of this brief should be as follows:

- 'Why?' Section – Setting the context of urban green space interventions.
- 'Who?' Section – Outlining the target audience and purpose of the brief.
- 'What?' Section – Description of urban green space interventions and their local benefits.
- 'How?' Section – Provision of validated good practices and suggestions for planning, implementing and evaluating urban green space interventions.
- 'So What?' Section – Overall key messages on urban green space interventions. Meeting participants agreed to review the first draft of the brief and to work in collaboration with WHO to further develop and finalize it.

The meeting participants also recommended that in addition to the brief targeted at green space practitioners, a high-level, succinct flyer should be developed which is targeted specifically at policy and decision-makers. This product should provide clear messages on the benefits and importance of urban green space interventions. Should such a document be created, it will be developed in collaboration with meeting participants.

Annex 1: Programme

Tuesday, 20 September 2016

09.00 – 09.30	Registration – Welcome coffee
SESSION 1	OPENING AND SETTING THE SCENE
09.30 – 10.15	Welcome, introduction to the workshop and "tour de table" *(WHO)*
10.15 – 10.30	WHO report on urban green spaces and health – key findings
10.30 – 11.00	Working paper 1: Evidence review on urban green space interventions
11.00 – 11.30	Coffee break
11.30 – 12.00	Working paper 2: Case studies on urban green space interventions
12.00 – 12.30	Working paper 3: Health Impact Assessment and Environmental Impact Assessment in urban green space interventions
12.30 – 13.00	Discussion
13.00 – 14.00	Lunch break *(Rondell next to the Cafeteria)*
SESSION 2	WORKING GROUPS ON THE IMPACTS OF URBAN GREEN SPACE INTERVENTIONS
14.00 – 16.00	▪ Working Group A: Findings from the evidence review on urban green space interventions ▪ Working Group B: Findings derived from local action and city examples on urban green space planning and implementation ▪ Working Group C: Findings on Health Impact Assessment and Environmental Impact Assessment action
16.00 – 16.30	Coffee break
SESSION 3	CONCLUSIONS ON URBAN GREEN SPACE INTERVENTION IMPACTS
16.30 – 17.30	Feedback session – Representatives of the working groups
18.00 – 19.00	Guided Tour through the museum

Wednesday, 21 September 2016

SESSION 4	WORKING GROUPS ON INTEGRATING HEALTH AND EQUITY IN URBAN GREEN SPACE INTERVENTIONS
09.15 – 11.00	▪ Working Group D: How to integrate health aspects in urban green space interventions ▪ Working Group E: How to integrate equity aspects in urban green space

	interventions
11.00 – 11.30	Coffee break
SESSION 5 11.30 – 12.30	CONCLUSIONS ON INTEGRATING HEALTH AND EQUITY IN URBAN GREEN SPACE INTERVENTIONS Feedback session – Representatives of the working groups
12.30 – 13.30	Lunch break *(Rondell next to the Cafeteria)*
CLOSING SESSION	KEY MESSAGES AND WRAP-UP
13.30 – 15.00	Drafting of key messages on urban green space interventions
15.00 – 15.30	Wrap-up and closure of the workshop *(WHO)*

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[9] The views expressed in this report are those of the authors and do not necessarily represent the views or policies of US EPA. Mention of trade names, products, or services does not convey, and should not be interpreted as conveying official US EPA approval, endorsement or recommendation.

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The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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