World Health Organization
REGIONAL OFFICE FOR Europe

From Linear to Circular Economy: Health Implications of Sustainable Consumption and Production

Report of WHO Meeting

12–13 November 2018

Bonn, Germany

Abstract

To improve the integration of health considerations of the mainly positive but also partially negative potential impacts of circular economy implementations, WHO Regional Office for Europe developed a report "*Circular Economy and Health – Opportunities and Risks*" in August 2018. Based on this report, WHO arranged an international stakeholder meeting in Bonn, Germany, 12–13 November 2018. The expert consultation aimed to identify and provide practical guidance on how to integrate health into the development of circular economy strategies. The participants agreed that the health sector needs to be more pro-active and engage with all other relevant stakeholders to position health as an enabler of this development and ultimately, to address positive and negative health aspects for the best possible health outcome for all. Methods to assess health effects of CE actions are Environmental Impact Assessment as well as Strategic Environmental Assessment with a stronger focus on health, and Health Impact Assessment.

Keywords

Conservation of Natural Resources

Environmental Health

Economics – trends, economics

Environmental Policy – trends, economics

Health Impact Assessment

Environmental Impact Assessment

Recycling – trends, economics

Strategic Environmental Assessment

Waste Management – trends, economics

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Contents

Acknowledgements

This report reflects the discussion and conclusions of the WHO meeting “From Linear to Circular Economy: Health Implications of Sustainable Consumption and Production”, held in Bonn, Germany, 12–13 November 2018. The programme and list of participants are shown in the annexes. WHO is most grateful to all participating experts who shared their knowledge, experiences and views.

The meeting was chaired by George Morris, Honorary Professor at the European Centre for Environment and Human Health, University of Exeter. Under supervision, Ms Sarah Humboldt-Dachroeden, in her role as rapporteur, together with Ms Majd Al Ssabbagh, drafted the report based on oral and written contributions and a draft review from all meeting participants.

WHO gratefully acknowledges the financial support of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Abbreviations

CaRBonH	Carbon Reduction Benefits on Health
CE	Circular Economy
CSCP	Collaborating Centre on Sustainable Consumption and Production
EC	European Commission
ECEH	WHO European Centre for Environment and Health
EEA	European Environment Agency
EIA	Environmental Impact Assessment
EU	European Union
HIA	Health Impact Assessment
HiAP	Health in All Policies
INHERIT	INter-sectoral Health and Environment Research for InnovaTion
LCA	Life Cycle Assessment
NGO	Nongovernmental Organization
PolyCE	Post-Consumer High-tech Recycled Polymers for a Circular Economy
ProSUM	Prospecting Secondary raw materials in the Urban mine and Mining wastes
SAICM	Strategic Approach to International Chemicals Management
SCYCLE	Sustainable Cycles Programme
SDGs	Sustainable Development Goals
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
SIRKKU	Managing chemicals and ensuring safe and sustainable circular economy
StEP	Solving the E-waste Problem
UN	United Nations
UNEP	United Nations Environment Programme
UNU	United Nations University
WHO	World Health Organization

Executive Summary

Transition to a circular economy is widely regarded as central to sustainable development. Yet the actions required to achieve this goal have potential positive and negative impacts on health and well-being, the nature and scale of which are yet largely undetermined. This can be overcome by developing practical approaches to enable policy-makers and others better understand and manage the health, well-being and equity implications of the move towards a circular economy. The WHO evidence report, *Circular Economy and Health – Opportunities and Risks (2018)* has made a critical initial contribution by reviewing the concept of circular economy and its implementation in the context of health. Importantly, the report provides evidence on health implications and highlights the roles of policy-makers, research communities and other stakeholders. An important next step is to identify entry points for the health sector and the development of practical tools.

Several frameworks to assess health impacts of policies, strategies, programs and projects are available, with Health Impact Assessment (HIA) being the most comprehensive health-focused package available. Health impacts are also included in several other assessment frameworks, such as Environment Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). Each of these approaches has significant potential to deliver evidence and efficient solutions when considering the health implications of the circular economy and the steps that are implicit in its delivery. Information about health effects, both positive and negative, contribute to the policy debate and provide an opportunity for the health sector to engage with, and influence, a critical area of public policy.

In this context, the WHO European Centre for Environment and Health hosted a meeting in Bonn, Germany, on 12-13 November 2018. The main objective was to discuss the draft of a report, which will provide Member States with practical advice and guidance on how to integrate health issues into the development of circular economy strategies and implementation policies.

The participants provided their comments and recommendations, emphasizing the intersectoral nature of the transition towards circular economy; the roles of multiple stakeholders, and the importance of advocacy to raise awareness on the topic.

As a next step, the outcomes of the discussions and working groups will be used to finalize a publication with the working title, *Health in Circular Economy – A brief for decision-makers and planners*.

Introduction

On the 2015-2030 global journey to reach all 17 Sustainable Development Goals (SDGs) (See Fig. 1), several transformations in different sectors of the economy and society are taking place. The movement from linear towards circular economy (CE) will help in achieving multiple SDGs, particularly SDG 12 on responsible consumption and production. The radical change of production and consumption patterns implicit in creating CE will enable progress towards SDG 3 on health and well-being while simultaneously supporting achievement of several other SDGs, such as SDG 11 on sustainable cities and communities and SDG 13 on climate change. Consideration of the health implications of a transition to CE has been relatively limited to date.

Fig. 1. Sustainable Development Goals 3, 11, 12 and 13

Nevertheless, there are significant attempts to recognize health impacts of construction, including material choices. For example, the nexus between green and healthy building standards, such as the fairly new WELL Building Standard, which puts people`s health and well-being at the centre of design and takes a holistic approach to health in the built environment by addressing behavior, operations and design. Furthermore, the outcomes of the Ecocity Forum 2018, with the theme Circular Economy in Smart Cities, (3-5 October 2018, Thessaloniki, Greece) includes plans to draft a CE guidebook for communities. This work will be further developed and presented at the 2019 Ecocity World Summit in October in Canada, where CE is one of the three subthemes.

Based on the WHO evidence report *Circular Economy and Health – Opportunities and Risks (2018),* the meeting in Bonn was held to further identify and review the health implications of proposed and implemented CE models and practices. The main discussion revolved around the draft of a new WHO report on actions that decision-makers and planners in Member States could use to integrate health issues into the development of CE strategies and implementation policies. The new report will highlight practical approaches, methods and resources for health and environmental assessments.

A backdrop of concern over the health and equity implications of a changing global environment; growing interest in, and awareness of CE as a concept; and the need for the report as a resource, shaped the meeting agenda. Specifically, the meeting sought to highlight approaches to maximize positive health impacts from production and consumption flows, while moving towards a CE and pursuing SDG 12 as well as SDG 3 and its targets. Drawing on the various initiatives, approaches, strategies and case studies presented, participants proposed improvements of the draft report and several ways forward for policy actions. Discussions revolved around potential approaches, methods, and resources for Health Impact Assessment (HIA), as well as better integration of health into Environmental Impact Assessment (EIA) and

Strategic Impact Assessment (SEA). Participants acknowledged the need to adapt available materials and resources to enable their effective use in integrating health within the CE context while creating entry points for health professionals to influence circular transformations.

Scope and purpose of the meeting

The extensive use of natural resources threatens to exceed the carrying capacity of the planet. The concept of a CE offers an avenue to sustainable production and consumption, good health and decent jobs, while reducing human pressure on the environment and natural resources. Further, the change from a linear economy (take, make, dispose) to a circular economy (renew, remake, share) would significantly support the attainment of the Sustainable Development Goals (SDGs), particularly SDG 12 on responsible consumption and production and, if properly implemented, SDG 3 "Good Health and Well-Being".

So far, consideration of the health implications of a transition to CE has been relatively limited; health studies of CE implications are still in their infancy and so far the health sector has been relatively absent from the discussion on the positive and negative implications of a CE. Therefore, in August 2018, WHO published an evidence report, *Circular Economy and Health – Opportunities and Risks (2018),* to facilitate and increase the inclusion of positive and negative health effects into the policy debate and to foster active involvement of the health sector in these discussions. Basing discussions on this report, and on other national and international initiatives[1] , participants further identified and reviewed the health implications of proposed and partly implemented CE models and practices. They also discussed the draft of a brief for action on circular economy and health, to be published to provide Member States with practical advice and guidance on how to integrate health issues into the development of circular economy strategies and implementation policies.

Based on the presentation of initiatives, approaches, strategies and case studies from various institutions at international to local level, participants proposed several avenues for future policy actions. Specific objectives of the meeting were to:

- identify existing and new approaches on key methods and resources for health impact analysis, prioritization and policy recommendations to be used for CE proposals;
- present and analyse available materials and resources for awareness-raising on sustainable production and consumption in a health-friendly manner; and
- discuss the proposed action brief and develop further its key messages and conclusions.

Ultimately, the results and outcomes of the meeting should help Member States to maximize the positive health impacts from production and consumption flows, while moving towards CE while pursuing multiple SDGs and their targets.

The meeting was organized by the WHO European Centre for Environment and Health and was funded by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

Approaches in the WHO European Region

Revisiting the available evidence on health risks and opportunities accompanying the transformation to

[1] **Circular Economy policy initiatives**: 1) Pan-European Strategic Framework as part of the "Batumi Initiative on Green Economy (BIG-E; 2016-2030)"; 2) "Green Growth Knowledge Platform", 3) UNECE`s strategic framework on "Greening the Economy"; 4) UNIDO`s "Network of Cleaner Production Centres"; and 5) European Commission`s "Circular Economy Package and Action Plan".

CE, the presented updates on health and CE pointed out the pressing need for better incorporation of health and, by extension, HIA, in any CE strategy, policy or project. The strategy document of the European Commission (EC), *Closing the loop – An EU action plan for the Circular Economy (2018)*, enables the European Union (EU) "to generate new and sustainable competitive advantages for Europe where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized." This "is an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy" (COM/2015/0614). The 2018 Circular Economy Package includes a strategy for plastics, new legislation on chemicals, products, and waste, a monitoring framework, a report on critical raw materials, a report on oxo-degradable plastics and a revision of the directive on port reception facilities (see Fig. 2).

Legislation on the interface of chemicals, products and waste covers the identification and tracking of substances of concern to facilitate traceability and risk management of chemicals in recycled materials and classification of waste. Proposed methods comprise feasibility studies, simplified procedures, developing guidelines together with decision-making methodology on recyclability, facilitating cooperation, developing an online repository, providing guidance and exchanging best practices.

Fig. 2. CE Package

Source: European Union, 1995-2019

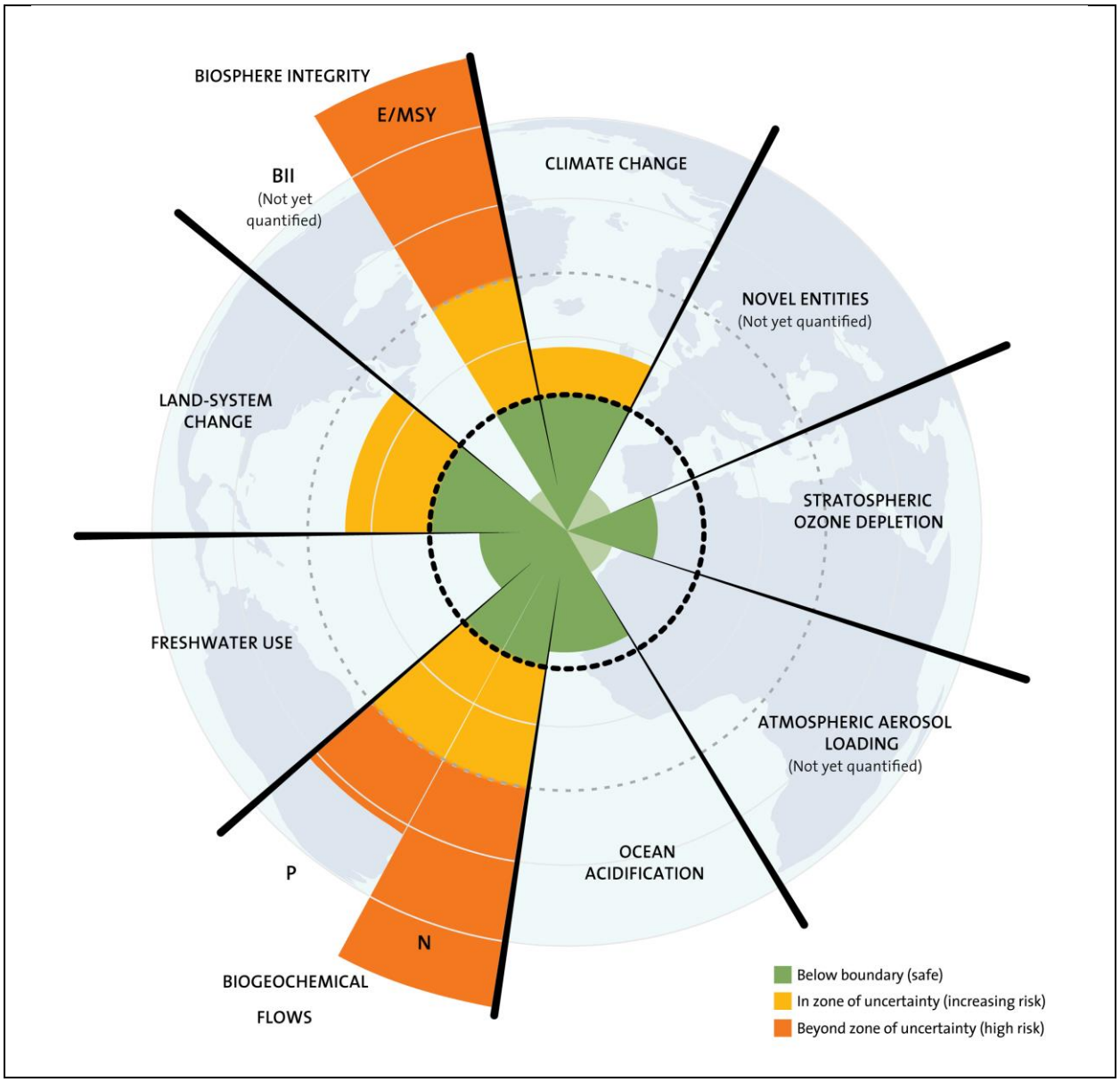
The EC supports and funds active research of CE-related projects. Such activity is key to closing knowledge gaps and translating knowledge to relevant stakeholders. This is crucial to inform policy-makers and influence policies.

The European Environment Agency (EEA) defines CE as when "all mankind lives well within the limits of the planet through developing the knowledge base and closing knowledge gaps while being aware of planetary boundaries" (see Fig. 3). To achieve this, the EEA supports EU member countries, especially in the policy-making process, to make informed decisions to promote the environment. In this context, it is important to take a systems perspective: attention to matters such as the availability of recycling facilities, the designs of products and the safety of recycling. Adopting system design principles will be key, enabling a more comprehensive appraisal of options and safeguarding against so-called tramline or blinkered thinking.

The so-called safe by design principle rethinks how products are designed, especially as concerns chemicals and safety. Within the CE context, several product quality issues might arise, especially due to down cycling or the use of mixed material products, in order to reduce hazards and chemical complexity.

To achieve a meaningful transition to CE, government endorsement will be essential to engage and support businesses and industries, as will be legislation against illegal waste export.

Fig. 3. Planetary boundaries



Source: J. Lokrantz/Azote based on Steffen et al. 2015.

International approaches

A number of projects and approaches within and across EU member countries are concerned, in various ways, with the transition to CE. Some can potentially inform the process and optimize the management of the transition to deliver benefits to health and well-being while avoiding negative unintended consequences. The following projects and approaches are examples of CE and HIA implementation.

The EC-funded INter-sectoral Health and Environment Research for InnovaTion (INHERIT) project aims to promote health, health equity and environmental sustainability though identifying and evaluating policies

and approaches across member countries, in order to influence these parameters by changing the way humans behave as they live, move and consume. The research focuses on green spaces, energy efficient housing, active mobility and food consumption. The project is a collaboration of academic, NGO, business and other partners across the EU. In pursuing a triple win of health, equity and environmental sustainability the aspirations of INHERIT are entirely consistent with the wider societal efforts to develop CE. The main connection to CE lies in the work of the project on promoting sustainable lifestyles through consumption patterns that contribute to several CE actions, including reduced use of primary resources, maintaining the highest value of materials and products and changing utilization patterns.

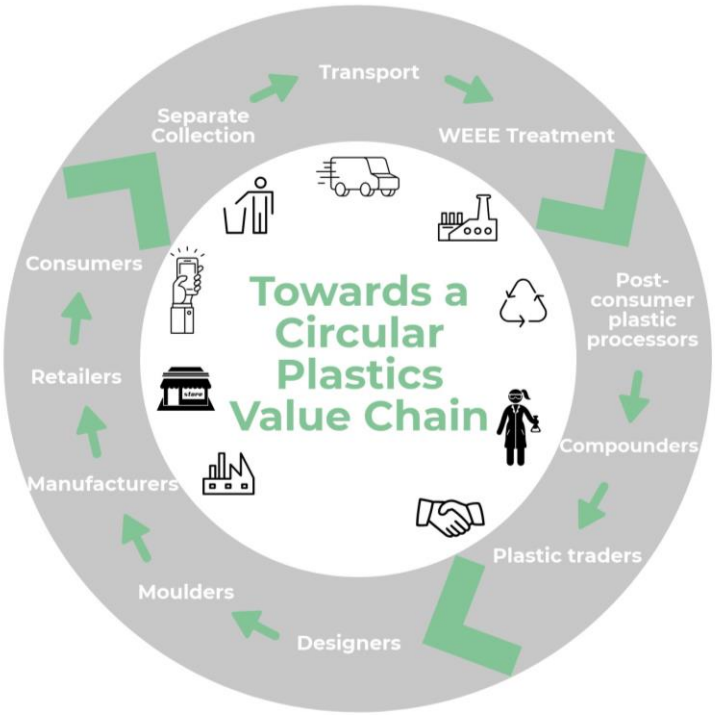
E-waste recycling can have serious negative health implications. E-waste is specifically problematic in recycling because it contains brominated flame-retardants, which are persistent, bioaccumulative and toxic. Analytical methods to detect these compounds are not yet in use for technical and economic reasons.

Furthermore, e-waste recycling can negatively affect vulnerable populations in low-income countries or regions, which, despite legislation, are the recipients of e-waste generated globally.

CE might be able to offer some solutions to the e-waste problem, and the United Nations University (UNU) is addressing these challenges by running several projects such as the Sustainable Cycles Programme (SCYCLE) and StEP (Solving the e-waste problem). The projects support strategic approaches towards a sustainable economy. Stakeholder inclusion as well as activities addressing sustainable e-waste management, production, use and disposal are core approaches of the projects.

Focusing on all waste, the Post-Consumer High-tech Recycled Polymers for a Circular Economy (PolyCE)project demonstrates the feasibility of a circular model for the plastics supply chain and aims to establish a grading system for recycled plastics (see Fig. 4). The project Prospecting Secondary raw materials in the Urban mine and Mining wastes (ProSUM) aims to improve the management of wastes and thus establish the first Urban Mine Knowledge Data Platform.

Fig. 4. PolyCE Project



Source: Violeta Nikolova, United Nations University

A number of countries have adopted individual approaches to implementing and improving the CE. The Finnish Environment Institute, for example, promotes a sustainable transition towards CE through a focus on sustainable economies with safe products and services. Projects running in Finland include the Circwaste project (funded by EU-LIFE IP) and the SIRKKU project (Managing chemicals and ensuring safe and sustainable circular economy), funded by the Finnish Government). These projects aim to promote CE by addressing waste management, recycling and chemical safety, collecting and disseminating good examples. A preliminary finding of the SIRKKU project is the need for wider impact assessment and to use the Life Cycle Assessment (LCA) perspective, based on the results of an online survey of CE industries. Further approaches to CE implementation address the sustainability of food production and consumption to save and recycle natural resources. In practice, this is the promotion of vegetarian food with activities targeting children and CE restaurants. The MORTTI project (Mobile nutrient recovery under field conditions) is looking for solutions to capture and use nutrients from urine and faeces.

So-called circular cities are smart and efficient in their design and operation, and aim to establish efficient waste management or even render it redundant. Circular city and CE transition in cities is characterized by a healthy built environment, sustainable energy systems, urban mobility, urban bio economy, and a local production system, all of which have direct health benefits. The Alexander von Humboldt Foundation and the University of Aalborg provided two examples of circular cities in developed economies: Amsterdam in the Netherlands and Paris in France. Amsterdam aims to design for the future, extend product life and localize resource production and consumption, thus minimizing resource dependency on other countries and reducing greenhouse gas emissions. The local government's circular strategies go hand-in-hand with sustainable transformations to a smart city and the sharing economy. The focus is on regenerative resources, incorporating digital technology, using waste as a resource and collaborating to

create joint value. In Paris, circular economy strategies are being applied using a socially centred approach aimed at building collective intelligence for enhancing recovering and sharing dynamics. The implementation of CE in Paris entails the involvement of various actors, including NGOs and social groups. The focus is on responsible consumption, planning and construction, recycling, reuse, redistribution and education.

Funded by the EC's LIFE programme, the Institute of Clinical Physiology in Italy implemented the HIA21 project. This was a participatory evaluation of the health, environmental and socioeconomic impacts of urban waste treatment policies. It is used the HIA approach to quantify the health outcomes and utilized community engagement to assess the potential impacts. The project involved multiple determinants of health, such as improved governance, green industries, optimizing and downsizing of chemical plants, health prevention and behavioural change. The project achieved its targets of reduction, recovery, recycling and reuse, which resulted in short and long-term benefits for health and the environment. It was endorsed by the local administration in cooperation with the private consortium leading the waste management.

In Wales, United Kingdom, HIA is taking a leading role in achieving HiAP, which is an important driver of strategic development in the country. The Wales HIA Support Unit (WHIASU) and Public Health Wales implemented several HIAs as part of the process of developing CE strategies and projects, such as the "Wales Waste Strategy" and "Reduce, Reuse and Recycle". These projects reflect the emphasis of the government on health and well-being, equity, citizen centred public services, partnerships, integrated agendas and sustainable development. The success of HIA in Wales evolved through various channels such as general political will, a specialized HIA unit, WHIASU – supporting the development of HIA through its web sites and developing resources and trainings – strategic advocacy in all policy areas, realistic goals for mitigation of impacts, and an inclusive stakeholder engagement that is open, democratic and participatory.

The WHO European Centre for Environment and Health (ECEH) is committed to working with both the health and environmental sectors towards CE, which is seen, for instance, as an essential player in mitigating climate change. In the light of the 2018 IPCC report *Global Warming of 1.5 °C*, a tool called "Carbon Reduction Benefits on Health" (CarBonH) is under development to qualify and quantify benefits for health from carbon reduction. The tool uses a pre-loaded demographics, exposures, epidemiology and economics database. By entering country and regional levels of emission reduction, the output will be population exposure changes, physical health benefits and economic benefits.

Another example is WHO's work under the Strategic Approach to International Chemicals Management (SAICM) and placing CE in the SAICM framework. The main concern in relation to human health is circulation of hazardous chemicals. It might be one of reasons of different opinions about inclusion of circular economy issues in international chemicals management agendas. Discussion is on-going regarding CE in the context of SAICM policy and objectives.

Furthermore, ECEH provides support in HIA to WHO Member States by developing methodologies and tools, carrying out assessments and reviews, and advising on policy options. Integrating health as early as the planning process can allow for early identification of primary prevention opportunities, and can help avert unnecessary health burden and related costs for workers, employers and communities.

Health in Circular Economy – draft WHO document

On behalf of and in close cooperation with ECEH, a working group of consultants has produced the draft report *Health in Circular Economy – A brief for decision-makers and planners*. The document addresses the limited analysis and coverage of health implications and benefits in the context of increasing prominence of CE concepts in policy development and business practices. Furthermore, it emphasizes the need to involve the health sector and all stakeholders in framing national, regional and local CE actions and supporting their implementation. The document addresses the need for an improved understanding of health impacts in the transition to CE and a more complete assessment of policy priorities for addressing negative health impacts and enhancing positive ones. The consideration of health impacts should be integrated in all national, regional and global strategies and action plans for CE. The report offers practical advice and guidance on how to achieve this goal during development of CE strategies, action plans and implementation policies.

The most prominent and promising framework within which to consider health in CE is that of HIA. However, health is also considered in other frameworks such as Environmental Impact Assessment (EIA), Strategic Environmental assessment (SEA) and Social Impact Assessment (SIA). While these protocols lack the bespoke health-focus implicit in HIA, each has potential to provide additional information and understanding. In essence, they add value to decision-making, particularly in circumstances where, unlike other frameworks, HIA is not a formal requirement. HIA is distinguished by a recognition that human health is greatly influenced by policies and actions in many domains (including those involved in the transition to CE) that are beyond the health care sector and affect health via a variety of pathways. HIA uses comprehensive models of health which include so-called hard health endpoints (e.g. mortality, morbidity) and soft ones (e.g. well-being, quality of life). It also considers economic, social and environmental determinants. Furthermore, HIA has the potential to harmonize with other impact assessments.

The environmental assessments EIA and SEA are both important tools especially as, unlike HIA, they are mandatory within the EU. More specifically, the EU EIA Directive 85/337/EEC states that projects which have significant effects on the environment must perform an EIA. EU Directive 2001/42/EC makes SEA mandatory for a wide range of public plans and programmes. Although EIA and SEA include impacts on population and health, they focus on risk factors in the physical environment. Opportunities for promoting health and well-being through social determinants are often neglected. An enhanced integration of health into these environmental assessments could result in an improved examination of health effects.

Within an SIA, health impacts are considered but guidelines do not typically require detailed analysis of determinants or pathways of specific health impacts. The emphasis of an SIA is to examine the distribution of impacts on different groups in society, particularly vulnerable groups. The LCA tool assesses environmental impacts and sustainability within a product's life cycle. It can aid evaluation of CE policies and actions. However, the assessment should be used in combination with other tools such as EIA, since LCA generally excludes economic, social and health impacts as well as local environmental issues.

There is a growing interest in so-called Social Lifecycle Impact Assessment, also known as S-LCA, and new protocols are emerging, including a UNEP S-LCA guidance document (http://www.unep.fr/shared/publications/pdf/dtix1164xpa-guidelines_slca.pdf).

HIA's inclusive stakeholder engagement, its emphasis on assessing the effects on health inequalities and its ability to identify and assess positive and negative health impacts of CE actions, makes it a useful framework. However, the usefulness of HIA and environmental assessments generally need further

examination and development through practical examples. A more comprehensive integration of health into EIA and SEA is important to assess health aspects effectively within the CE context.

Working group results and discussion points

In order to discuss the draft WHO document *Health in Circular Economy – A brief for decision-makers and planners*, participants worked in three groups to discuss the document, the proposed tools and frameworks for assessing health impacts of CE policies and plans, and provide advice for further improvements. The working groups were also asked to identify existing as well as new approaches or key methods and resources for health impact analysis. The results of the group work are as follows:

Technical

All groups felt the document title could be amended to better reflect the report content and target audience, specifically replacing the terms “brief” and “decision-makers” as these can be misleading. There was support for inclusion, somewhere within the amended title, of the term SDGs and how the achievement of many SDGs is predicated on the transition to CE.

The language needs improvement, especially consistency of terms, such as “benefits”, “impacts”, “risks” and “hazards”. This was considered important to enable readers to clearly identify and understand outlined approaches and ideas.

Identifying the exact audience of the report is essential to producing tailored and targeted audience-oriented content. The participants suggested that not only policy-makers, but also public health professionals, should be addressed.

Methodology

The importance of stakeholder engagement in the transition to CE and in addressing its health implications was a recurring theme of the meeting. There was an emphasis on the need to clarify which stakeholders must be involved, and the processes to which they could contribute. In this regard, stakeholder mapping is important. A participatory approach is deemed necessary to allow greater depth and breadth of analysis and implicitly a more comprehensive understanding of impacts, approaches and differing perspectives. This is more likely to identify and deliver effective, workable solutions. Stakeholder mapping should identify those responsible for bridging intersectorial areas and designing actions and policies at local and national level. In this way, different perspectives and contexts can be considered when developing policies. A network analysis can assess the perspective of civil society, politics and science to facilitate implementation at the nexus of CE and health.

Case studies and scenarios of successful integration of health aspects in CE implementation should be included to illustrate what worked, how, who was involved and in which role. . This will help disseminate promising/good/best/-practice, useful guidance, possible solutions and information on approaches adopted in designing, and methods used for implementing, projects, plans and policies. Together these can highlight possible pathways to applying CE and assessing its impact.

Legislation and policy-making

There is a need for more research on CE and its health implications. The inter-sectorial nature of CE becomes apparent when considering how to ensure that the outputs of research are useful to policy and other decision-makers. Research should feed into and inform the policy-making process and be aligned by content and timing to the actual political agenda and prioritization. Policy needs and research outputs are not always concurrent. Accordingly, there is a need for strong evidence if policy-makers are to be aware of the importance of health assessment in relation to CE actions. A key element would be to apply a framework/systems approach in which an assessment system (e.g. consisting of a tiered SEA and EIA approach) provides a framework in which specific tasks are addressed in policies, plans, programmes and projects that are related to CE.

It is important to reflect carefully about who is involved in policy-making and how to deliver and translate evidence and methods to policy-makers, to ensure relevance and feed effectively into the policy cycle. Assessing the context, especially the economic context of CE projects is crucial to improve implementation, e.g. in the planning of resources such as workforce and institutional capacities. The level and levers of action of CE must be determined to introduce a tailored approach. In this regard, the case studies to be included in the document should provide an evidence-based input useful for policy-makers and other professionals/actors involved in CE implementation.

The participants expressed support for a short (maximum two-page) leaflet making the case for a health perspective within CE. This two-pager could include key definitions, figures, risks, benefits, costs, the need and opportunities for actions, as well as recommended strategies.

HIA, health in EAs and CE

The health dimension should be made explicit throughout the draft report and especially when considering the role of environmental impact assessment frameworks. The document should emphasize the value of stand-alone HIAs showing how these can be utilized. It should also explain how health can be effectively integrated into EIAs and SEAs given that, unlike HIA, these are mandatory in the EU. The document can reinforce the value of HIA in considering health and its determinants in the widest possible sense. Equal emphasis should be accorded to proximal as well as distal health effects and on health benefits as well as health risks.

Quantifying health benefits of CE projects will provide a more rigid foundation for decision-makers. HIA, EIA and SEA are tools that produce both micro and macro scale assessments, incorporate equity evaluation of vulnerable groups and can be tailored to specific needs. They can illustrate indirect, long-term and international impacts; not only the direct, immediate and local ones.

Participants identified a need to tailor and develop HIAs or EIA approaches to meet the needs of industrial users. As the majority of CE activities are driven by businesses and industries, the final report should support those specific sectors and emphasize that striving towards CE takes time for each individual business. CE implementation is often at regional and/or national level yet the social, health, equity etc., impacts may be experienced quite locally. The impact assessment must therefore also be tailored and focused according to needs of local and regional level structures.

It is important to raise the awareness on health impacts among those concerned in planning and implementing CE and to increase health literacy. It is also necessary to identify appropriate entry points for health professionals. Equity and ethical considerations should be prominent at all levels of CE

implementation. The report should include guiding principles for promoting health, well-being, equity and quality environments tailored for those who implement CE actions. Equity must be a key dimension of any impact assessment applied to implementation of CE. This can be achieved through tailoring HIA and EA guidance .

There is a good business case for the transition to CE. All changes should be implemented with a commitment to ensure specific groups are not disadvantaged. This is especially so for those who are vulnerable due to economic, social, or individual circumstances such as disability or chronic ill health.

Another important political and economic issue to be considered and flagged as an enabler of the CE transition is the fact that the majority of countries in the WHO European Region are welfare-based states, where the provision of health care is one of the costliest public services. This means that integrating health elements in CE offers them an ideal opportunity to decrease negative health impacts and thereby directly decreases the cost of health care systems.

Environmental assessments, especially strategic assessments, are flexible tools and can be utilized in a variety of ways.. The report should present evidence on how to apply these assessments in differing contexts. Ecocity is incorporating such evidence in its CE guidebook. It was suggested that both this and the WHO document could be presented at the Ecocity World Summit 2019 in Vancouver, Canada, as a means to engage a broader audience participation in the discussion (ecocity2019.com).

SIA and LCA can be useful as additional information sources and as tools. However, as health is a subsidiary concern for each, these frameworks should appear in the main document in summary form with details reserved for an Annex.

Overall, it was agreed that WHO and its partners should promote the integration of HIAs in the transition from linear to circular economy, thereby achieving the desired environmental and human health goals.

Conclusion

The meeting allowed experts in economics and in environment and health to exchange ideas. It offered an ideal platform for a combination of theoretical and practical discussions which are necessary if health is to be effectively integrated in the transition towards CE.

While appreciating the challenges of distilling such complex issues for such a diverse and multisectoral audience, participants emphasized the huge importance of securing the integration of HIA in the transition to CE. The current non-mandatory status of HIA presents a challenge yet there is clear scope to exploit mandatory frameworks such as EIA and SEA in the interests of health, well-being and equity when implementing CE. This demands not only a greater emphasis on health within the mandatory frameworks but a more inclusive understanding of health and its determinants. For policy-makers and business alike, a time-frame and prioritization can facilitate legislative implementation. There is a need for further research to address a knowledge and evidence deficit in areas of CE and HIA in general.

Health professionals, industry NGOs and policy-makers must collaborate within and across their own sectors to achieve a safe transition to a CE. To support a more pro-active engagement of the health sector, entry points into CE actions of industries and governments must be established.

The participants recognized that an important function of the discussed document should be to create awareness in the health sector and all sectors involved in CE planning and implementation. There must be a greater understanding of the need to incorporate health, acknowledging the complexity of the transition towards a CE. There is a clear convergence of benefits to health and equity in the delivery of CE, with the achievement of the SDGs, especially SGD 3, SDG 11, SDG 12 and SDG 13. This is or ought to be a clear incentive for policy and other decision-makers at all levels to embrace the messages contained in the document.

Way forward

The document has sought, throughout, to emphasize the importance attached by meeting participants to securing the incorporation of HIA (and the exploitation of tools such as EIA and SEA where appropriate) in managing the transition to CE. It was agreed that WHO and the health sector should act as facilitators in securing the policy, sectoral and stakeholder integration necessary to embody health in the CE transition. An evidence-based and practical assessment of health impacts within CE actions and implementations is essential to protect and promote health.

The next step will be finalization of the WHO document, which will facilitate sector-specific as well as intersectoral implementation of HIA and will provide methodological support. It will incorporate ideas and approaches to establish a practical document on HIA and health in EAs and respective implementation approaches within different CE contexts. The final report will be published in the spring of 2019.

Annex I – List of participants

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Lorenzo Lionello	WHO European Office for Investment for Health and Development
Marco Martuzzi	WHO European Centre for Environment and Health
Julia Nowacki	WHO European Centre for Environment and Health
Irina Zastenskaya	WHO European Centre for Environment and Health

Annex II – Programme

Monday, 12 November

10.00–10.30	Registration with coffee/tea
10.30–11.00	Opening and welcome • Introduction of participants, meeting objectives, approval of Chair (WHO, Marco Martuzzi) • Rationale and context • WHO 6th Ministerial Conference on Environment and Health – Development and Implementation of National Portfolios for Action (WHO, Marco Martuzzi) • Scope and Purpose of meeting (WHO, Frank George)
11.00–12.30	WHO report *Circular Economyand Health – Opportunities and Risks* • Presentation on the WHO report findings (University of Bath, Alistair Hunt and Nick Dale) • Reflections on report and CE in general (LSHTM, Andy Haines – via webex) • Q&A • Updates on Circular Economy and Health – International Organizations • The Chemicals Waste Product Interface as part of the European Commission`s Circular Economy Package (DG Environment, Bernhard Berger) • Research strategies and activities in the area of Circular Economy, Environment and Health (DG Research, Maria Pilar Aguar) • European Environment Agency update (EEA, Mieke De Schoenmakere) Q&A
12.30-12.40 12.40–13.30	Group photo Lunch break (LE29th floor)
13.30–14.30	Updates on Circular Economy and Health – International Organizations and CSOs • DG Research project INHERIT results (Center for Sustainable Consumption and Production, Rosa Strube) • E-Waste and Circular Economy (German Corporation for International Cooperation, GIZ, Fatima Seidu) • E-Waste yearly reports and research United Nations University (United Nations University, UNU, Violeta Nikolova) • From Linear to Circular Economy: Health Implications of Sustainable Consumption and Production (SDG 12) – Linkages with Climate Change (UNFCCC, Livia Hollins) Q&A
14.30-15.15	Case Studies I – Circular Economy Countries, Regions and Cities • Netherland: National Institute for Public Health and the Environment perspectives on CE and Health (RIVM, Sandra Boekhold) • Greece: Experiences with Circular Economy and Health (Aristotle University of Thessaloniki, Dimosthenis Sarigiannis) • Finland: Sustainable Circular Economy Experiences and Activities (Finnish Environment Institute, Sari Kauppi) Q&A
15.15–15.45	Tea/Coffee break

15.45–16.15	Case Studies II – Circular Economy Cities • Results of Research Studies, *Circular Cities of the 21st Century* (Alexander von Humboldt Foundation, Piyush Dhawan) • Key Findings of Circular Economy and Cities Research (Aalborg University, Chiara Fratini) Q&A and first reflections of WHO Regions for Health Network
16.15–17.45	Health and Environment Assessments in the Context of Circular Economy • Strategic Environmental Assessment (SEA) in the context of CE (University of Liverpool, Thomas B. Fischer) • Health Impact Assessment (HIA) and Circular Economy linkages (Kings College London, Heather Walton) • HIA in the Context of Waste Management Planning – the Example of Wales (Wales Health Impact Assessment Support Unit/Public Health Wales, Liz Green) • HIA Case Study on Urban Waste Treatment (Italian National Council of Research, Nunzia Linzalone) • WHO reflections on Circular Economy and Environment and Health Areas • Chemicals and Circular Economy (WHO, Irina Zastenskaya) via webex • Waste-Water Reuse Challenges (WHO, Shinee Enkhtsetseg) • Climate Change and Circular Economy (WHO, Vladimir Kendrowski) • The Role of EIA and HIA in CE (WHO, Julia Nowacki) Q&A
17.45	Closure of day 1 (Chair)

Tuesday, 13 November

9.00–9.45	Health in Circular Economy • WHO draft report *A brief for decision-makers and planners* (WHO consultants: Alistair Hunt, Nick Dale and Fintan Hurley) • Key Methods and Resources for Health Impact Analysis, Prioritization and Policy Recommendations to be used for Circular Economy Projects • Key messages and Conclusions of the Action Brief Q&A
9.45–11.00	Working groups on the policy brief
11.00-11.30	Tea/Coffee break (in front of working group rooms)
11.30-12.30	Continuation of three working groups and preparation of summary and PPT
12.30-13.30	Lunch break (29th floor – afterwards back to plenary room LE 2705)
13.30-14.45	Presentation of results working groups Open debate
14.45-15.00	• Future work and final conclusions – Next steps (WHO, Frank George) • Meeting summary and key messages (Chair)
15.00	Farewell and meeting closure (WHO, Marco Martuzzi)

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