

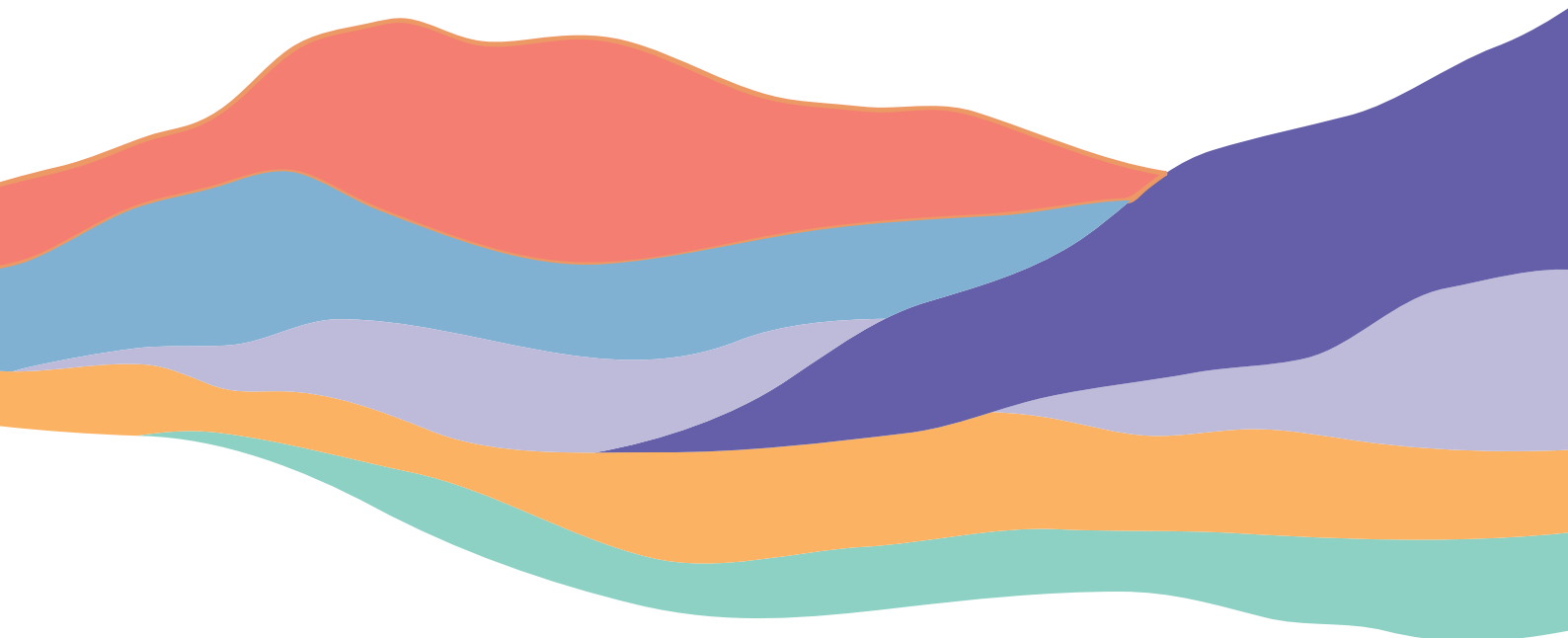


World Health
Organization

European Region

Noncommunicable diseases and climate change

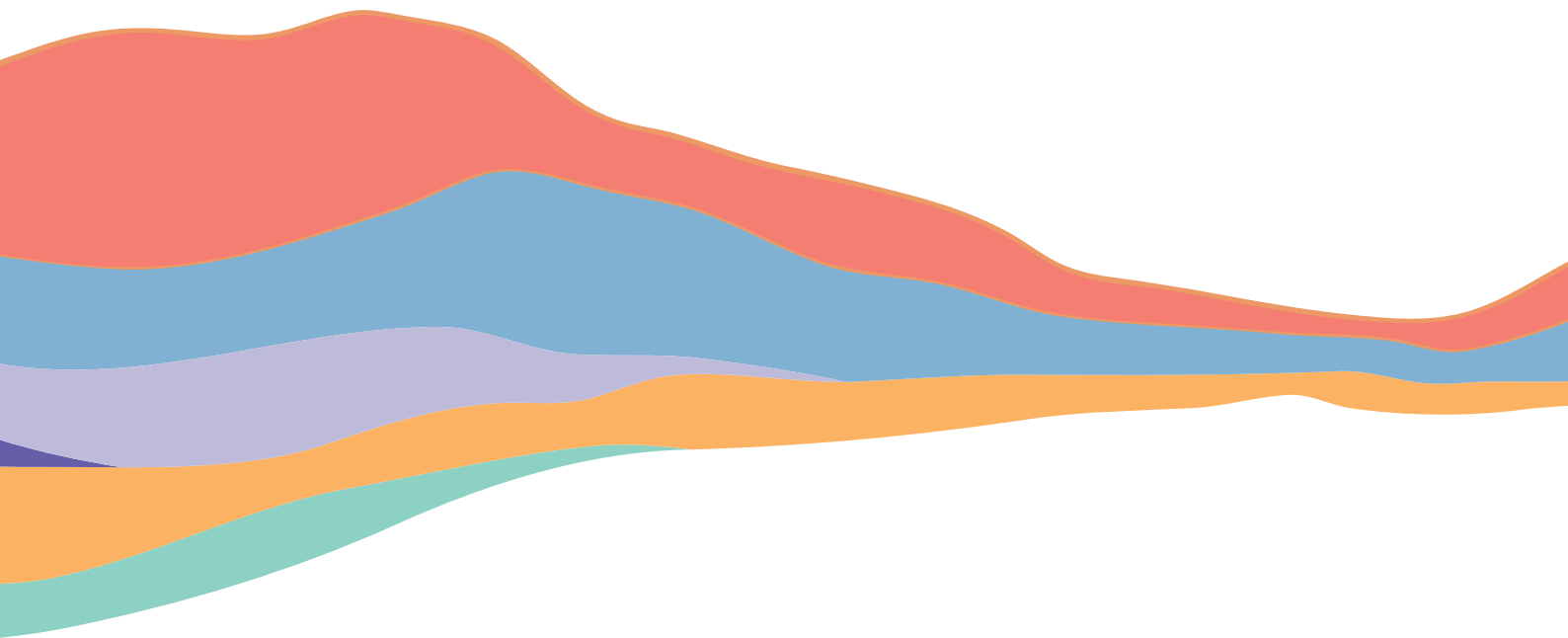
Report of an expert meeting
Bonn, Germany, 1–2 December 2022





Noncommunicable diseases and climate change

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— Abstract

The WHO European Office for the Prevention and Control of NCDs and the WHO European Centre for Environment and Health held an expert meeting to map the co-benefits of linking NCD prevention and climate change, guided by experts from across the Region. The meeting was an opportunity to explore wider areas of work for this emerging programme. This report summarizes the presentations and discussions.

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— Background

WHO has identified climate change as one of the greatest health threats of the 21st century and air pollution as the single largest environmental health risk. Noncommunicable diseases (NCDs), including cardiovascular diseases, diabetes, chronic respiratory disease and cancer, are the leading causes of death in the European Region and globally, the latter rate being 74% (1). Planetary health, of which climate change is one aspect, is based on the concept that human health and human civilization depend on flourishing natural systems (2).

NCDs can be prevented through policies to address their main risk factors, including physical inactivity, unhealthy diets (including overconsumption), alcohol consumption, tobacco use and air pollution. Policies designed to prevent NCDs also have many co-benefits for climate change mitigation and adaptation. Examples are given below.

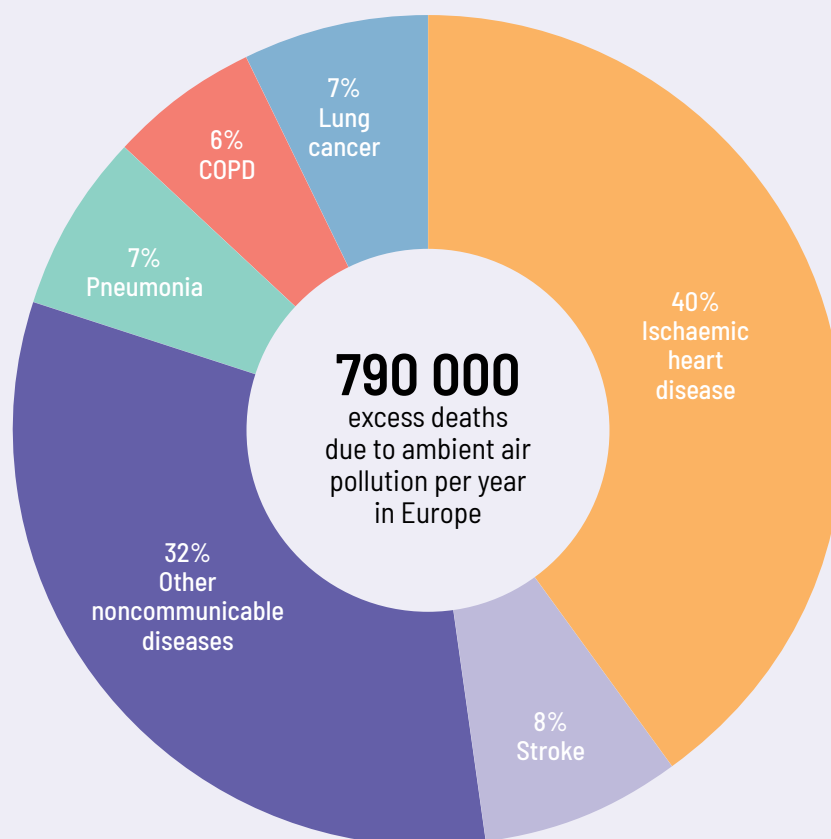
- The risk of death for people who are insufficiently physically active is increased by 20–30% (3). Policies to support walking and/or cycling can both improve health through increased physical activity and reduce air pollution and carbon emissions by decreasing dependence on travel in private motorized vehicles.

- In 2017, 11 million deaths were attributable to dietary risk factors (4), while food production produced approximately 34% of annual greenhouse gas emissions in 2015 (5). Promotion of sustainable healthy food systems could improve the availability of and access to healthy diets while reducing the environmental impact of food production.

- In the European Region, alcohol consumption causes almost 1 million deaths annually (6), and tobacco use is responsible for 16% of all deaths in adults over 30 years, many of the deaths occurring prematurely (7). Production of alcohol and tobacco products has a major detrimental impact on the environment and carbon emissions through transport, water use and packaging.

- Each year, 8.8 million people worldwide and 790 000 in the European Region die due to exposure to ambient air pollution, mainly from cardiovascular and respiratory diseases and lung cancer (8) (see Fig. 1). The *International Agency for Research on Cancer* (IARC), classified ambient air pollution and particulate matter in ambient air pollution as carcinogenic (group 1) to humans in 2015. A supralinear concentration–response relation has also been found between very low (< 5 µg/m³) concentrations of small outdoor particulate matter (PM_{2.5}) and mortality (9). This suggests that an additional 1.5 million deaths globally are attributable to outdoor PM_{2.5} annually over and above previous estimates. The global health benefits of meeting the new WHO guideline for outdoor PM_{2.5} are thus greater than previously assumed, calling for continued reductions in outdoor air pollution around the world.

Fig. 1. Estimated proportions of excess deaths due to ambient air pollution per year in Europe



Source: Lelieveld et al. (8)
COPD, chronic obstructive pulmonary disease

There is growing awareness of and evidence for the large societal benefits that can result from policies and interventions to ensure multiple health co-benefits while mitigating climate change. For example, most policies that are effective in reducing air pollution can also mitigate climate change. Thus, transport and land use policies can reduce travel and increase means for safe cycling and walking and public transport. These policies reduce emissions from the transport sector, mitigate climate change, reduce air pollution, increase physical activity, make cities more liveable and attractive, and improve mental health by providing good-quality green spaces.

Similarly, the dietary patterns that contribute to the rising burden of diet-related chronic disease are also responsible for a disproportionate share of the environmental impact of the food system. Dietary change therefore reduces the adverse environmental and health impacts of the food system (10–14). Several international initiatives have defined dietary patterns that are both health-promoting and environmentally sustainable. Although the details vary, these diets usually emphasize fresh or minimally processed fruit and vegetables, legumes, nuts, seeds, and whole-grain products, with only moderate amounts of animal-sourced and ultra-processed foods (12, 15–17). It has been estimated that worldwide adherence to such a diet would reduce global greenhouse gas emissions from the food system by half, even without changes

to agricultural production techniques and a reduction of food waste (17). In addition, substantial health benefits would accrue from adopting such a dietary pattern (10,12,17).

Not all actions that promote environmental sustainability would, however, also promote health (including a reduction in NCDs) and vice versa, and trade-offs should be considered. For example, fish, seafood and dairy products, which are generally considered to be healthy, are environmentally hazardous (18–20). Food processing is likely to be vital to increase environmental sustainability (e.g. extending shelf life and reducing food waste) but will not reduce the prevalence of NCDs.

One Health is an approach to optimizing the health of humans, animals and ecosystems by collaboration among these fields, for example against zoonotic disease, antimicrobial resistance and food contamination. NCDs are also linked to One Health, for example, when pollutants bioaccumulate in animals that are then consumed by humans, which may contribute to the development of NCDs. Animals affected by environmental pollution may serve as an early warning of human illness (21,22). Environmental stressors such as air pollution, land use change and livestock agriculture exacerbate One Health issues, are risk factors for NCDs, and are leading causes of climate change. Climate change multiplies the threats of both infectious diseases and NCDs.

Climate change is increasing the risks of emergencies and disasters, such as extreme weather events, with widespread effects on many sectors of society. The all-hazards approach is based on the recognition that, while hazards may differ by source (natural, technological, societal), they often affect health systems similarly and require a multisectoral response (23). The Sendai Framework for Disaster Risk Reduction (2015–2030) outlines concrete actions to protect development gains from risks of disaster (24). The United Nations set an ambitious 5-year deadline for countries to ensure that their populations are protected against extreme weather and the other consequences of climate change by early warning systems (25). The Sixth Assessment Report of the United Nations Intergovernmental Panel on Climate Change addresses ecosystems, biodiversity and human communities globally and regionally (26).

In 2015, the United Nations adopted the 2030 Agenda for Sustainable Development, a “shared blueprint for peace and prosperity”, with 17 Sustainable Development Goals. These include a number that are relevant to climate change and NCDs, including zero hunger; good health and well-being; clean water and sanitation; affordable and clean energy; industry, innovation and infrastructure; sustainable cities and communities; responsible consumption and production; life on land; reduced inequalities; and partnerships (27).

The Pan-European Commission on Health and Sustainable Development, a group that includes former heads of state and government, distinguished life scientists and economists, heads of health and social institutions, and leaders of the business community and financial institutions in the European Region, identified strategies for addressing complex challenges to public health, including strengthening multisectoral collaboration for effective management of shared risks.

Implementing holistic solutions to health and environmental risks will require intersectoral approaches. Common barriers to intersectoral action are lack of political support, insufficient

leadership, weak links to other sectors and limited institutional or procedural capacity. Common facilitators include executive leadership to promote intersectoral action, shared goals and coordination among different sectors, active involvement of citizens, and robust accountability mechanisms (28). “Systems thinking” refers to ideas and methods that encourage consideration of the “bigger picture” in addressing complex problems. It is supported by systems approaches, which typically involve participatory methods. Group model building and causal loop diagrams are examples of such methods (29).

— Expert meeting

The WHO Regional Office for Europe, through the WHO European Office for the Prevention and Control of Noncommunicable Diseases and the WHO European Centre for Environment and Health, organized an expert meeting as a first step towards better alignment of NCD prevention policies with strategies for adaptation to and mitigation of climate change.

The objectives of the meeting were to:

- discuss and clarify the pathways by which NCDs and climate change are related;
 - discuss the co-benefits of addressing them through group model building in an exploratory phase with the goal of creating common ownership; and
 - identify key multisectoral actors and priorities for international collaboration and national responses to NCDs and climate change.
-

Annex 1 provides the full programme.

The expected output was this meeting report, which includes:

- a causal loop diagram showing the factors and their relations by which climate change influences NCDs and NCD risk factors in Europe;
 - roles, responsibilities and challenges in conducting multisectoral action on NCD prevention and climate change; and
 - guidance for future work in WHO Regional Office for Europe on integration of NCD prevention and climate change.
-

— Day 1

Presentations

Presentations were made on climate change and NCD prevention, emergencies and environmental health in the WHO European Region by unit heads and programme leads, followed by a keynote presentation by Professor Andrew Haines (see “Setting the scene” in Annex 1).

Group model-building workshop

The experts then co-designed a causal loop diagram according to the principles of group model building. The workshop was led by Professor Ruth Hunter and Dr Leandro Garcia, Centre for Public Health, Queen’s University Belfast, and WHO Collaborating Centre for research and training on complex systems and network science for NCD prevention and control. The method provided a causal loop diagram that reflected the experts’ experience, knowledge, perceptions and views of the factors and their relations by which climate change influences NCDs and NCD risk factors in Europe. It thus represented the consensus of the experts on the problem and formed a basis for exploring the future impact of sectoral and multisectoral public policies to address the complex challenges.

The 29 participants in the workshop included WHO staff and experts in NCD prevention and/or climate change and health and health emergencies (Annex 2). The workshop was held mainly in person, while some participants joined online for the morning session on day 1.

The objectives of the workshop were to:

- build shared understanding of the complex system through which climate change, NCDs and NCD risk factors interact in Europe; and
- identify and explore priorities, opportunities and actions to share policies for NCD prevention and climate change mitigation and adaptation in Europe, including for multisectoral stakeholders, and what is necessary to implement the actions.

The outputs of the workshop were:

- a draft causal loop diagram of the complex system, showing how climate change influences NCDs and NCD risk factors in Europe; and
 - a preliminary list of priorities, opportunities and actions for common policies for NCD prevention and for climate change mitigation and adaptation in Europe, informed by the causal loop diagram.
-

The agenda for the workshop followed a series of scripted activities with content from Scriptapedia. Ruth Hunter made a short introduction to the project and the problem to be addressed. Leandro Garcia then introduced systems thinking and causal loop diagramming. An initial draft of the causal loop diagram (Annex 3), prepared primarily by Ruth Hunter after a review of the literature before the workshop, was presented, which identified key factors and interconnections. The discussion among participants included the scope and purpose of systems mapping, such as whether it should include problems or solutions, the level of detail required and whether any items that were omitted would be excluded automatically in the future. Participants were asked to propose any changes to the diagram, such as factors, relations or feedback loops that were missing or should be corrected or removed. An online platform was used to explore the model during the workshop and for any changes to be made “live” by Ruth Hunter, the facilitator, and Leandro Garcia, the modeller. The changes were reviewed by the group to ensure that they reflected their views.

After the workshop, Ruth Hunter and Leandro Garcia met to discuss and agree on changes to be made to the causal loop diagram as a result of the discussions, to ensure that it accurately reflected the participants’ inputs and the co-design process. The revised diagram was then sent to all the participants in the workshop, in person or online, who were asked to provide feedback.

The revisions made to the model after the workshop were:

Inclusion of:

- drivers of greenhouse emissions, such as production, consumption, waste disposal and unsustainable urban and rural planning;
- the links between increased NCD prevalence → health-care resources → health-care emissions → increased general greenhouse emissions;
- the link between natural disaster events and mental health;
- other factors, such as deforestation and ultraviolet radiation;
- migration as a possible result of natural disasters and increased risks of NCDs;
- further links between tobacco consumption and production, NCDs and climate change;
- other elements of the food environment and the food system beyond food security, such as policies that influence food production and consumption (food taxation and food labelling); and
- social and economic inequalities and determinants.

Removal of links between:

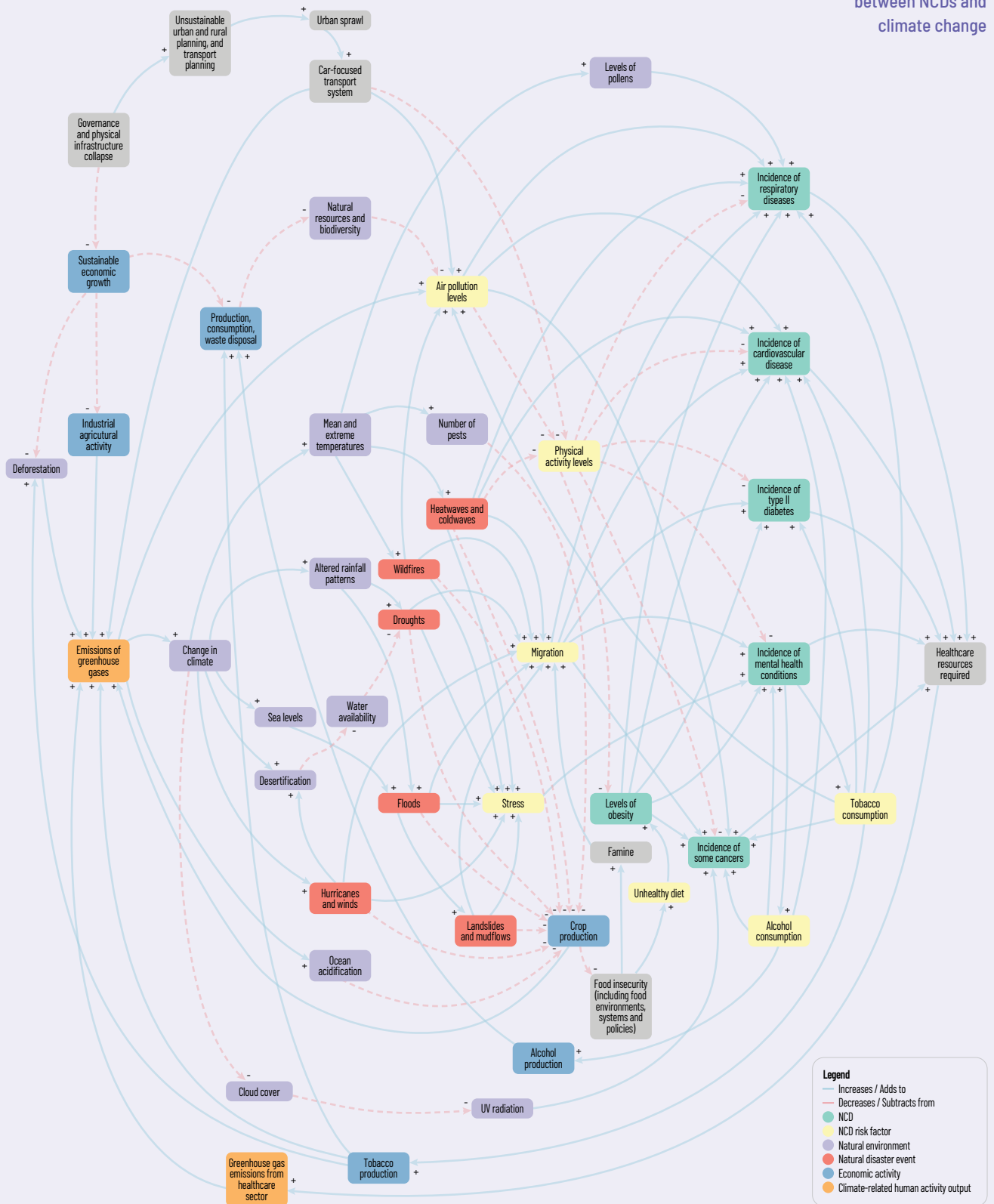
- alcohol production and emissions of greenhouse gas (as this linkage was already indirectly represented via the addition of a node for “production, consumption and waste disposal”); and
- crop production and alcohol production (as the main relation with crop production is food insecurity).

Further, changes were made to the polarity of some of the linkages.

The revised causal loop diagram is shown in Fig. 2.

Contextual factors: health and social inequalities, conflict, poverty, trade agreements

Fig. 2. Causal loop diagram depicting the factors and interconnections between NCDs and climate change



The interactive model is available at: <https://kumu.io/qub-who-cc/who-ncd-and-climate-change-cld-1-dec-2022#who-ncd-and-climate-change-seed-structure>.

Identification of priority actions

The group also identified and prioritized actions to reshape the system, influence the prevalence of NCDs and mitigate climate change in Europe. The facilitator noted that interventions can be made at a number of places in a system: in nodes, in connections and feedback loops, in dynamics and arrangements that govern connections and feedback loops, in the goals of the system and in the general approach. These include interventions (policy, regulatory, market, technological) to impact:

-
- nodes directly (which may, however, be the least effective way to intervene, as it is usually only a short-term solution to a symptom in a feedback cycle);
 - a connection in the diagram, such as strengthening, weakening (ultimately eliminating) or introducing a new connection, including physical, policy, legislative, economic and technological aspects of a system's functioning that restrict or enable action;
 - the dynamics and arrangements that affect the connections or the system's functioning, such as routines, forms, procedures and protocols by which actors maintain the functioning of a system; and
 - the goals and mindset of the system, such as changing the cognitive, discursive and normative aspects.
-

Participants were then asked to identify specific factors, relations or feedback loops on the causal loop diagram and to rank their actions on these features with respect to ease of implementation and their potential impact. The proposals were collated on flip charts and placed in one quadrant according to their feasibility (low or high) and impact (low or high). Fig. 3 presents the priorities ranked by impact and feasibility. The actions considered to be highly feasible and with a potentially high impact were:

-
- better preparedness and response to extreme weather events,
 - policies and incentives for active travel and e-transport and
 - evidence-based food policies that integrate health and sustainability.
-

Fig. 3. Identified priority actions according to feasibility and potential impact



— Day 2

The session comprised a recapitulation of day 1, discussion of country support, and priorities for policy, practice and research, gaps and opportunities. The session was led by Martin W. Bloem and Vanessa Garcia Larsen, Johns Hopkins University (USA), and was based on the causal loop diagram and the priorities identified on day 1 (Annex 3).

Next steps

A number of options were identified, including after the session, to extend the preliminary work conducted:

-
- synthesis of the literature and online workshops to further develop and refine the diagram to support WHO priorities and to identify opportunities for cross-sectoral policy action and systemic change in areas such as pandemics or emerging infectious diseases, war and conflict;
 - potentially co-develop sub-system models, such as for food systems, urban planning systems, transport systems and the health effects of mitigation and adaptation measures including “green” and “blue” spaces, if they could facilitate more detailed conversations and break down siloed thinking;
 - an accompanying solutions-oriented map of synergies, co-benefits (i.e. good for both health and climate) and positive interventions, with key actors; exploration of the potential for country-specific solutions; and
 - a “best buys” report by WHO based on an agreed method for identifying interventions that promise considerable benefits for both health and sustainability and implementation at national, regional and municipal levels (with mechanisms for evaluation, monitoring and accountability); and
 - consideration of framing outputs through a well-being economy lens (see below).
-

Possible long-term extensions of this work are other advanced modelling techniques, such as systems archetypes (identifying common patterns of behaviour in a system to facilitate identification of “sweet spots” or finding aspects of the system for leverage), adaptive policies (considering whether a policy could be adapted to unintended and unanticipated consequences in the system), and quantification of the model with system dynamics modelling.

Wider work

Other concepts and strategies were discussed and proposed to drive the climate change and NCD agendas, including feedback by experts after the session. These can be categorized thematically as follows:

Concepts

- a well-being economy;
- true pricing and price interventions to promote sustainable food production and consumption and make healthy, sustainable food more accessible (with, for example the “polluter pays” principle, taxation of products or components of production, subsidies);
- inclusion of equity considerations in all actions and policies;
- sub-regionally and locally adapted approaches to assessments and interventions; and
- healthy, sustainable urban and transport planning.

Communication and awareness-raising

- improved education and awareness of climate change and the impacts on health, including NCDs, for WHO staff, ministries, civil servants (e.g. in presentations, infographics) and the public, highlighting implications within the European Region and the European context;
- public health messaging material and infographics for the general population and for vulnerable groups about what climate change means for their well-being in the short-term and providing them with options;
- short briefs for development and community agencies and ministries;
- policy briefs on subsidies and contributions to No Tobacco Day;
- development of an NCD and climate change “playbook”; and
- development of a common understanding of a healthy, sustainable diet (including the role of organic, genetically modified and locally produced foods) among stakeholders in the health, nutrition, sustainability and environmental communities, including clarification of relevant concepts, noting that “organic targets for agriculture” (see Fig. 3) will not necessarily reduce greenhouse gas emissions globally (30).

Existing stakeholders and workstreams

- maximizing collaboration with existing networks and stakeholders in climate change and NCDs (such as within WHO, the International Association of National Public Health Institutes, EuroHealthNet, C40 Cities Climate Leadership Group Inc, Working Group on Health and

Climate Change, and at inter-sessional meetings of the Conference of the Parties of the United Nations Convention on Climate Change [UNFCCC]);

- using reports and policy briefs (for example, of the United Nations Development Programme, the United Nations Environment Programme, the Food and Agriculture Organization and the World Organization for Animal Health), that align WHO country intervention agendas and outcomes of the UNFCCC;
 - identifying further national and municipal stakeholders, including municipal public health practitioners working on adaptation measures and on urban planning and considering links with the WHO Healthy Cities Network and urban organizations (UN Habitat, Local Governments for Sustainability, Eurocities, Polis Network);
 - identifying mechanisms to influence adoption of WHO air quality standards at legislative level;
 - capitalizing on existing ultraviolet indexes and dashboards (air pollution and weather) to maximize their benefits for NCDs;
 - contributing to the work of *The Lancet* in the European Lancet Countdown report (such as suggesting indicators); and
 - working on European Commission-funded projects on climate and health (e.g. CATALYSE, BEST-COST, BlueAdapt).
-

New stakeholders and potential workstreams

- strengthening multisectoral work within the European Union and with the United Nations Development Programme, the United Nations High Commissioner for Refugees and the World Food Programme on migration and refugee populations;
 - working with behavioural scientists and the arts and humanities sectors; and
 - establishing broader interconnectivity to define and address public health priorities, such as with the European Space Agency, National Aeronautics and Space Administration in the USA and city organizations such as Local Governments for Sustainability, and Eurocities.
-

Research areas and gaps

- evaluating implemented actions and accelerating updating of the evidence;
- synthesizing the evidence on the health impacts of climate change (such as heat) to obtain clinical and epidemiological data;
- studying how risk factors for NCDs are related to climate change scenarios;
- studying the direct impact of the agricultural sector on NCDs in agricultural workers and communities;

- using artificial intelligence for systematic reviews of publications on the risk factors for NCDs and climate change;
 - furthering the sustainability agenda:
 - development of sustainable recommendations for physical activity;
 - development of guidance on integration of sustainability into public health and clinical guidelines;
 - building on guidelines for healthy, sustainable food consumption based on that in the Nordic countries for other European countries, supported by cohort studies;
 - extending work on environmentally sustainable health systems;
 - identifying indicators of climate change other than greenhouse gas emissions;
 - developing nutrient profile models to assess the sustainability and health effects of food products in an integrated manner, for example for food labelling (As this is required to develop other policies, “labelling food, alcohol and tobacco for climate impact” in Fig. 3 should be considered as of high potential impact and placed in the top-right quadrant.);
 - quantitative modelling of the health impacts of decreasing greenhouse gas emissions, such as the disability-adjusted life years due to reducing greenhouse gas emissions by reducing meat consumption in countries with undernourished populations; and
 - identifying potential conflicts between the agendas for decreasing NCDs and for the environment, and finding approaches to negotiate any conflict.
-

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— Annex 1. Programme

Day 1	
08:30–09:00	Participant arrival and welcome
09:00–09:10	Welcome and opening remarks
	Co-chair: Kremlin Wickramasinghe, WHO European Office for the Prevention and Control of Noncommunicable Diseases, WHO Regional Office for Europe Co-chair: Francesca Racioppi, WHO European Centre for Environment and Health, WHO Regional Office for Europe
09:10–10:00	Setting the scene
09:10–09:20	NCD Prevention in the WHO European Region Kremlin Wickramasinghe, WHO European Office for the Prevention and Control of Noncommunicable Diseases, WHO Regional Office for Europe
09:20–09:30	Climate change and health in the WHO European Region Dorota Jarosinska and Oliver Schmoll, WHO European Centre for Environment and Health, WHO Regional Office for Europe
09:30–09:40	Emergencies and climate change in the WHO European Region Irshad Shaikh, WHO European Centre for Preparedness for Humanitarian and Health Emergencies, WHO Regional Office for Europe
09:40–09:55	Keynote presentation: Climate change mitigation and NCD prevention Andy Haines, London School of Hygiene and Tropical Medicine
09:55–10:15	Discussion

10:15–10:30	Discussion of draft background paper Vanessa Garcia Larsen, Johns Hopkins University
10:30–11:00	Active break
11:00–17:00	Group model-building workshop Facilitators: Ruth Hunter and Leandro Garcia, Centre for Public Health, Queen's University Belfast, WHO Collaborating Centre for research and training on complex systems and network science for NCD prevention and control
11:00–11:20	Introduction and problem articulation
11:20 – 11:50	Rich pictures and small group exercise
11:50–12:00	Systems thinking and causal loop diagrams
12:00–12:30	Presentation of draft pre-seeded model with links between NCD risk factors, climate change mitigation and impact of climate-related emergencies
12:30	Closed for online participants, remainder of day 1 for participants in Bonn only
12:30–13:30	Lunch
13:30 – 14:45	Model review 1 and feedback
14:45–15:15	Model review 2
15:15–15:35	Active break
15:35–16:45	Action ideas and identification of stakeholders
16:45–17:00	Next steps and closing
17:00	Close
19:00	Dinner

Day 2	
09:00	Welcome and recap of Day 1
09:00-09:15	Co-chair: Kremlin Wickramasinghe, WHO European Office for the Prevention and Control of Noncommunicable Diseases, WHO Regional Office for Europe Co-chair: Francesca Racioppi, WHO European Centre for Environment and Health, WHO Regional Office for Europe
09:15-09:45	Feedback from online participants and discussion
09:45-10:30	Country support What do countries need? What should be the focus/scope of the work of WHO Regional Office for Europe? How to advocate for multisectoral action on NCDs and climate change?
10:30-11:00	Active break
10:30 - 11:30	Priority actions in policy, practice and research Discussion of priority actions based on key findings from day 1 Martin Bloem, Johns Hopkins University
11:30-12:30	Gaps and opportunities Discussion of gaps and opportunities identified on day 1 Vanessa Garcia Larsen, Johns Hopkins University
12:30-13:00	Next steps Kremlin Wickramasinghe, WHO European Office for the Prevention and Control of Noncommunicable Diseases, WHO Regional Office for Europe Francesca Racioppi, WHO European Centre for Environment and Health, WHO Regional Office for Europe
13:00-14:00	Farewell lunch



— Annex 2. List of participants

Karim Abu-Omar, Friedrich Alexander University Erlangen-Nuremberg, Germany

Martin W. Bloem, Johns Hopkins University, Baltimore (MD), USA

Leandro Garcia, Centre for Public Health, Queen's University Belfast, United Kingdom,
WHO Collaborating Centre for research and training on complex systems and network
science for NCD prevention and control

Vanessa Garcia Larsen, Johns Hopkins University, Baltimore (MD), USA

Alba Godfrey, EuroHealthNet, Brussels, Belgium

Andy Haines, London School of Hygiene and Tropical Medicine, London, United Kingdom

Lisbeth Hall, National Institute for Public Health and the Environment,
Bilthoven, Netherlands (Kingdom of the)

Ruth Hunter, Centre for Public Health, Queen's University Belfast, United Kingdom,
WHO Collaborating Centre for research and training on complex systems and network
science for NCD prevention and control

Cale Lawlor, European Public Health Alliance, Brussels, Belgium

Aileen McGloin, Safefood, Little Island, Ireland

Thomas Münzel, University Medical Center Mainz, Germany

Mark Nieuwenhuijsen, Barcelona Institute for Global Health, Barcelona, Spain

Peter von Philipsborn, Ludwig-Maximilians-Universität München, Munich, Germany

Mike Rayner, Oxford Population Health, Nuffield Department of Population Health,
University of Oxford, United Kingdom

Jessica Renzella, Oxford Population Health, Nuffield Department of Population Health,
University of Oxford, United Kingdom

Pauline Scheelbeek, London School of Hygiene and Tropical Medicine, London, United Kingdom

Milka Sokolovic, European Public Health Alliance, Brussels, Belgium

Ido Toxopeus, National Institute for Public Health and the Environment,
Bilthoven, Netherlands (Kingdom of the)

World Health Organization

Headquarters

Simone St Claire, Healthier Populations

European Regional Office

European Office for the Prevention and Control of Noncommunicable Diseases, Moscow, Russian Federation

Wickramasinghe Kremlin, ad interim Head of Office, Regional Adviser (Nutrition, Physical Activity and Obesity)

Karin Geffert, Consultant

Maria Neufeld, Technical Officer (Alcohol)

Ivo Rakovac, Regional Adviser, NCD Surveillance

Stephen Whiting (NCDs), Technical Officer

WHO European Centre for Environment and Health, Bonn, Germany

Francesca Racioppi, Head of Office

Dorota Jarosinska, Programme Manager

Vladimir Kendrovski, Technical Officer

Sinaia Netanyahu, Programme Manager

Oliver Schmoll, Programme Manager

WHO European Centre for Preparedness for Humanitarian and Health Emergencies, Istanbul, Türkiye

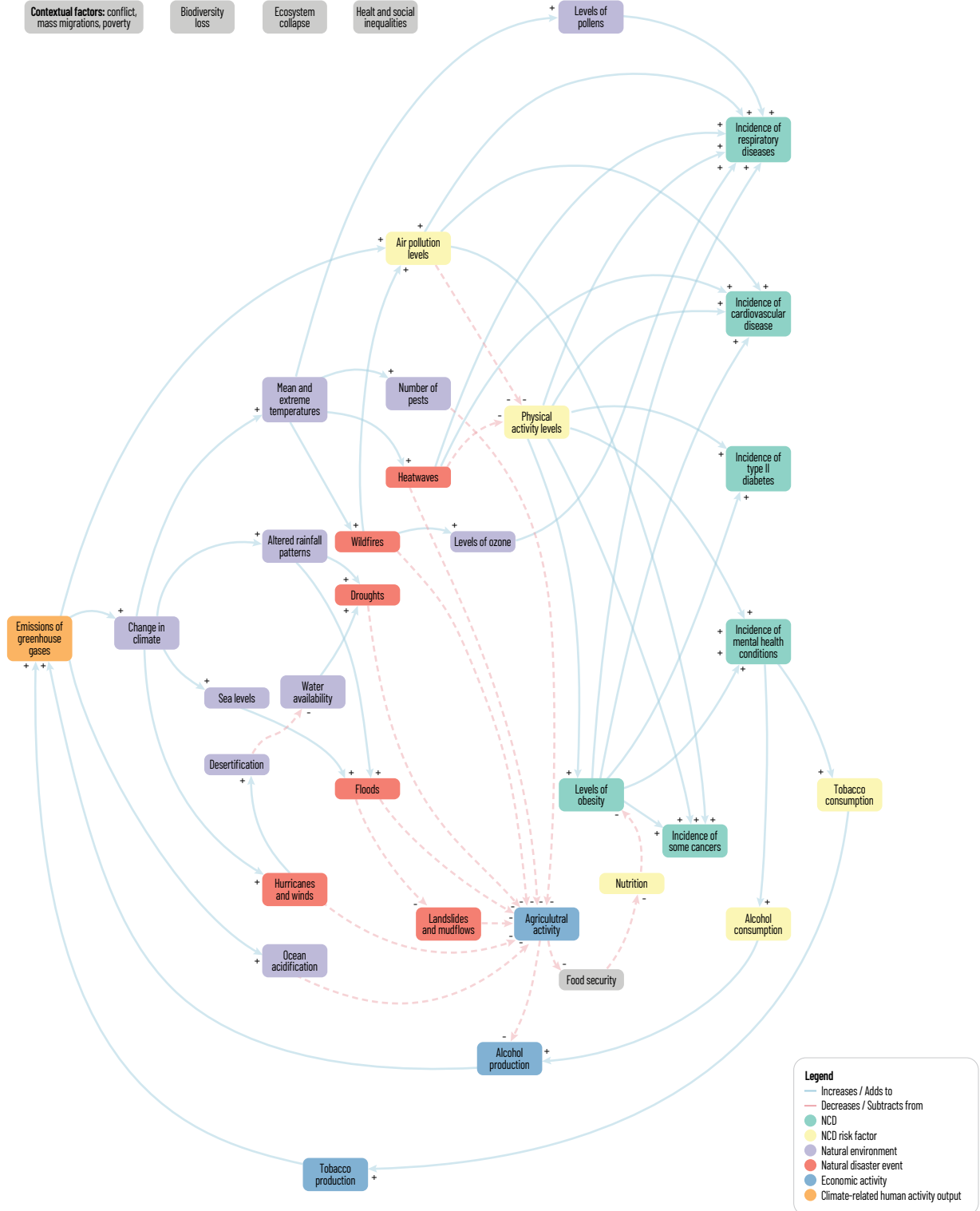
Irshad Shaikh, ad interim Head of Office

WHO European Office for Investment for Health and Development, Venice, Italy

Bettina Menne, Regional Technical Officer (Healthy Settings)

Annex 3.

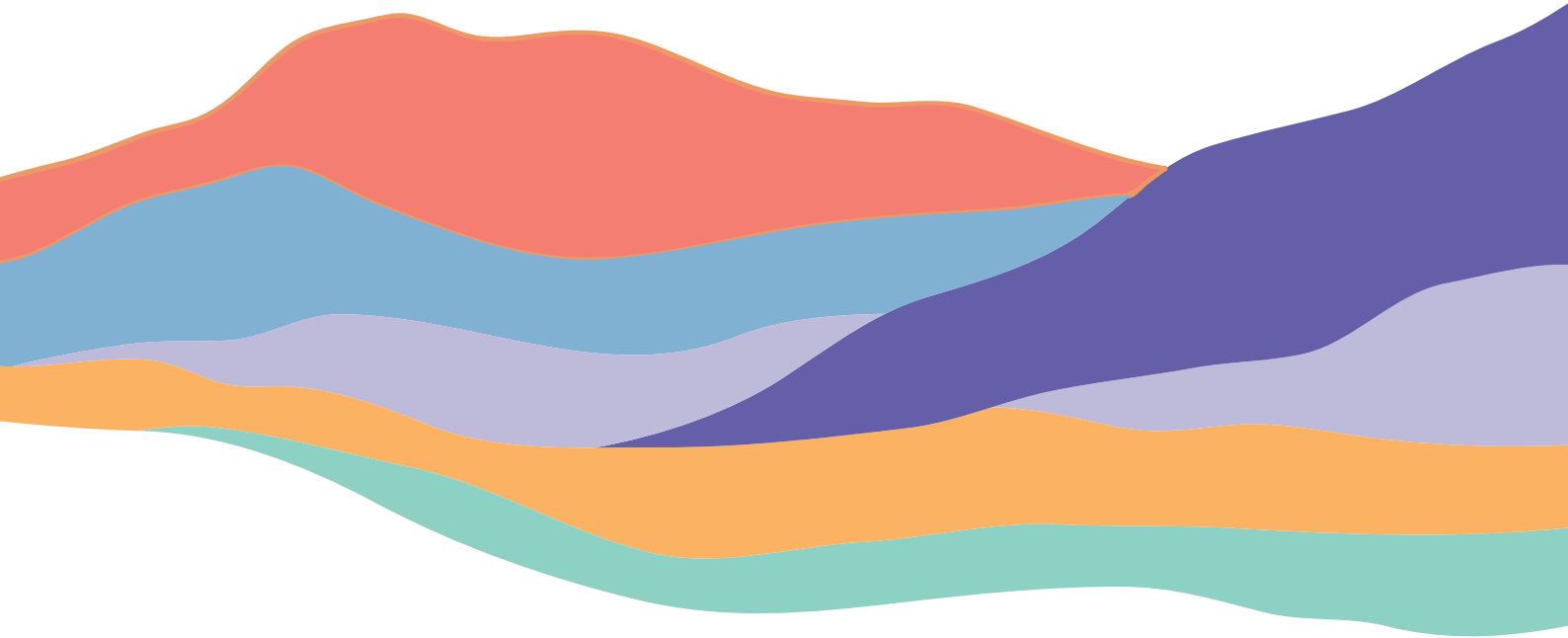
Initial draft of the causal loop diagram



Annex 4.

Agenda of the model-building workshop

Duration (min)	Activity	Description
15	Welcome and introductions	<ul style="list-style-type: none"> Introduction of facilitation team Summary of workshop goals Agenda
5	Problem articulation	<ul style="list-style-type: none"> Define problem to be addressed in the workshop
10	Introduction to topics	<ul style="list-style-type: none"> Introduction to systems thinking and causal loop diagrams
15	Pre-seeded model	<ul style="list-style-type: none"> Introduce draft pre-seeded model
15	Questions	<ul style="list-style-type: none"> Feedback and questions from group
60		
30	Model review 1	<ul style="list-style-type: none"> Review the causal loop diagram in small groups sketching on printed pre-seeded diagrams Identify other factors, inter-relationships, feedback loops
30	Model feedback	<ul style="list-style-type: none"> Small group feedback
30	Model review 2	<ul style="list-style-type: none"> Verify the causal loop diagram with participants
30	Active break	
60	Action ideas	<ul style="list-style-type: none"> Identification and prioritization of actions to change the system Identification of stakeholders
15	Action ideas summary	<ul style="list-style-type: none"> Summary of agreed action ideas and key stakeholders
15	Next steps and closing	<ul style="list-style-type: none"> Explain what is next Close





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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