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Transdisciplinary research program ‘City of the Future – healthy and sustainable metropolises’ – an initiative for sustainable urban development

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ABSTRACT

Launched in 2010, a dedicated program aims to develop an integrative approach for Sustainable Urban Health in Germany. The backbone are junior research groups, jointly supported by researchers and practitioners. While the scientific results were largely produced by PhD students and postdocs, a modular infrastructure has evolved to foster transdisciplinary exchange with the practice of Urban Health and to ensure continuity. This includes annual conferences, a bilingual website, and a series of book publications. The program succeeded in the transfer of scientific findings into practice and in generating a range of diverse spin-off developments, underlining the program’s fertility and value.

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urban planning

Human health and wellbeing of urban populations require an inter- and transdisciplinary perspective, beyond health sciences and medicine (Hornberg and Fehr 2022, Sell *et al.* 2022). Ecology and environmental sciences, economics, planning and architecture, in addition to other natural, cultural and social science disciplines, also play a key role in the development of healthy and livable cities. Despite this necessity, science and practice often remain within their disciplinary and sectoral boundaries, hardly communicating with each other.

Against this background, the Fritz and Hildegard Berg Foundation within the German Stifterverband decided to promote inter- and transdisciplinary research for healthy cities and regions (Fehr and Hornberg 2018, Zerbe *et al.* 2023). This donor, a small private foundation with assets amounting to € 8.5 million, has pursued this goal since 2010 with a research program for small research groups and annual conferences that bring science and practice together in a discourse on sustainable urban development.

We assume that main features of this ongoing program as well as major lessons learnt are essentially transferable to other countries and can thus stimulate urban health research and practice in other countries. Therefore, we present cornerstones of this research program, highlighting the program’s activities and its impetus for sustainable and healthy urban development. This paper is written by a group of advisory board members (cf. below). In addition to presenting the factual development, it reflects our personal views. We critically analyze the achievements of this program and invite to discuss.

Urban context

In addition to intensified land use (Van der Sluis *et al.* 2016), on the one hand, and land abandonment due to a complex range of drivers that vary over time and space (Ustaoglu and Collier 2018), on the other hand, urbanisation is one of the mega-trends of landscape development on the global scale (Zerbe 2022). In the European Union, around 76% of the population already live in cities (World Bank Open Data 2025). The forecast for Europe in 2050 amounts to nearly 84% (UN DESA 2018).

High population figures, often coupled with high population densities and urban sprawl, pose considerable challenges for urban planning (Yan *et al.* 2021, Barsties *et al.* 2025, Huang *et al.* 2025). In addition to the supply of urban dwellers with resources and services, human health and wellbeing have to be considered as top priorities for sustainable city development. This means that cities must not only offer jobs, infrastructure and culture, but also a healthy environment (Barton and Grant 2013, Siri 2016, Kuddus *et al.* 2020).

Since the 1970s, the World Health Organization (WHO) increasingly pays attention to urban health (Goldstein *et al.* 1995). A milestone is the Leipzig Charter, adopted in 2007, followed by the New Leipzig Charter in 2020 (Simon 2021). These two charters are meant to support the concept of integrated urban development at EU level. On the international level, related objectives have been coined by the 17 Sustainable Development Goals (SDGs).¹

Research program

In 2010, a new research program was launched in order to foster interdisciplinary and transdisciplinary research for healthy urban development. Coordinated by the Fritz and Hildegard Berg Foundation in the German Stifterverband, an interdisciplinary scientific advisory board was established, connecting the health sciences with other social (e.g. economics, urban and regional planning) and natural sciences (e.g. landscape ecology, restoration ecology). For this particular program, a starting point was formed by a series of academic excursions involving field trips, seminars, and student work (e.g. interviews). This contact between science and practice quickly revealed the need for transdisciplinary approaches to health and sustainability. The excursions, especially when organized as a joint activity of planners and Public Health, helped to deepen professional connections.

In connection with these excursions, the idea came up to try and establish some (small-sized) interdisciplinary groups in which doctoral students work together in a coordinated manner and which in turn operate within a larger framework, in order to achieve greater continuity and impact. This argument convinced a potential donor, so the program was launched. From the beginning, a scientific advisory board provides critical and constructive support for the program, assists with new calls for proposals, and contributes to the continuity of the work.

Figure 1 outlines main activities of the modular research program ‘City of the Future.’ Funded by the Fritz and Hildegard Berg Foundation since 2011, the program aims to link the two guiding concepts of sustainable health promotion and sustainable development with a focus on urban environments and their surroundings by activating an interdisciplinary dialogue. In particular, projects are promoted that

investigate disciplinary interfaces and analyse the influence of environmental resources on physical, mental, and social health. Accordingly, research fields include, for example, health and biodiversity, health and architecture, as well as health and digitization.

The total annual funding for the various program components (excluding spin-off activities) amounted to approximately €160,000 in the first few years and gradually increased to approximately €250,000.

Research groups

Within the program, the focus is on junior research groups, typically funded for 3+ years, with a new group launched every few years. Since 2011, five research groups with different research foci have been funded (Table 1). Particularly, so-called Junior Research Groups have been established as a funding format which supports 2-5 doctoral students and a postdoc academic coordinator. These groups were/are fully funded by the foundation. Separate from the research groups, the PhD supervisors were/are members of the respective universities. Thus, it can be considered a flexible small post-graduate doctorate school (Zerbe 2025).

The topics covered by the research consortia include the importance of urban green and blue space for the health and well-being of city dwellers, age-appropriate mobility, social inequality in health care, and the residential green (i.e. urban green in the residential environment, e.g. in yards, balconies, or the immediate residential environment). The interdisciplinarity is reflected in the diversity of disciplines involved in the research projects. In addition to the health sciences and medicine, also urban and spatial planning, landscape ecology, architecture, and geoinformation are involved.

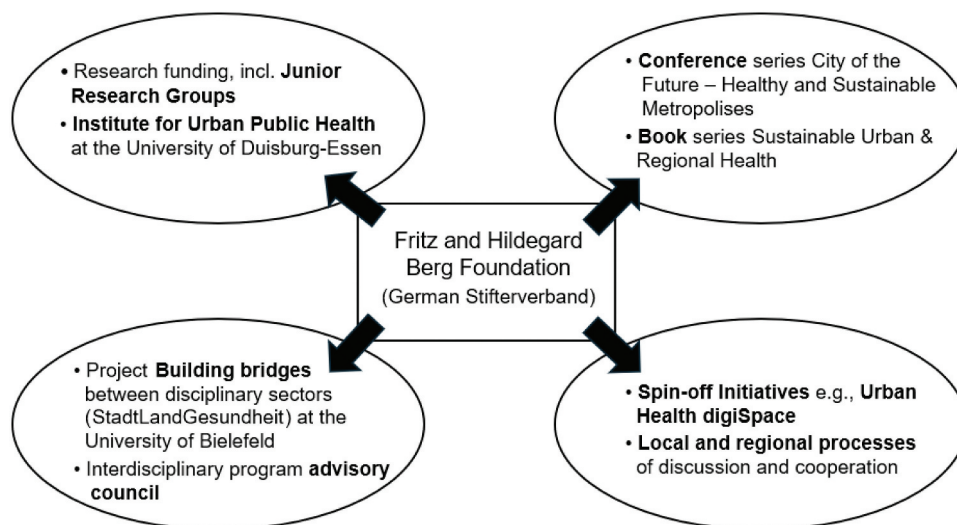


Figure 1. Components of the research program ‘City of the Future’, funded by the Fritz and Hildegard Berg Foundation within the German Stifterverband since 2011.

Table 1. Research groups (particularly JuFo = Junior research groups) funded by the Fritz and Hildegard Berg Foundation (German Stifterverband) since 2011.

Leading institution	Thematic research focus	Funding period	Partner research institutions	Partner from practice
University of Bielefeld, Faculty of Public Health, Environment & Health working group (JuFo)	Urban landscape and health	2011-2015	RWTH Aachen University, Landscape Architecture University of Bonn, Institute for Hygiene and Public Health	City of Bielefeld City of Gelsenkirchen
Technical University of Dortmund, Faculty of Spatial Planning, Dept. of Urban and Regional Planning (JuFo)	City as a healthy place to live in – regardless of social inequity	2012-2015	University of Fulda, Public Health Zentrum Fulda University of Bremen, Institute for Public Health and Nursing Research University of Twente (NL), Faculty of Geo-Information Science and Earth Observation	City of Munich City of Dortmund German Federal Environmental Agency Ministry for Environment, Agriculture, Nature Conservation and Consumer Protection of Northrhine-Westfalia General local health insurance fund (AOK) NorthWest Regional Association Ruhr WHO, Regional Office Europe
University of Stuttgart, Institute for Sport and Exercise Science, Chair of Sport and Health Sciences I (JuFo)	Age-friendly city – Autonomy and sustainable mobility in the age of climate change	2014-2018	University of Stuttgart, Institute for Landscape Planning and Ecology Robert Bosch Hospital, Clinic for Geriatric Rehabilitation Goethe University Frankfurt am Main, Department of Educational Sciences, Interdisciplinary Science of Ageing Institute for Regional and Urban Development Research gGmbH (ILS), Dortmund	Fraunhofer Institute for Industrial Engineering (IAO), Mobility and Urban Systems Design Transsolar KlimaEngineering Verband Region Stuttgart City of Stuttgart, Office for Environmental Protection Baden-Württemberg State Health Office
Humboldt University of Berlin, Integrative Research Institute on Transformations of Human-Environment Systems (IRI THESys), Multifunctional Landscapes Research Group	Healthy living – Urban planning strategies for residential urban green	2016-2020	Technical University of Berlin, Institute for Urban and Regional Planning, Department of Monument Conservation	Reference districts in the cities of Berlin (DE), Birmingham (UK), and Torino (IT)
University of Hamburg, University Medical Center Hamburg-Eppendorf (UKE), Institute for Health Services Research in Dermatology and Nursing Professions (IVDP) (JuFo)	Integrating health into municipal and transport planning – New governance structures in urban-regional transport corridors	2025-2027	University of Applied Sciences (HAW) Hamburg Technical University Hamburg (TUHH) HafenCity University (HCU) Hamburg	Hamburg Working Group for Health Promotion (HAG) e.V.

One of the main aims of this research program is to foster intensive cooperation among actors, stakeholders, and institutions. Instead of the purely academic orientation of conventional post-graduate programs, a cooperation between practice and science was to be established throughout the whole project. This follows the paradigm shift from science *for* society to science *with* society (Seidl *et al.* 2013), which is referred to as Mode 2 of transdisciplinarity (Scholz and Steiner 2015).

Transdisciplinary research is thus a strategy of co-production of knowledge together in a team of scientists, practitioners, and actors (Zerbe 2023), of joint learning (Pahl-Wostl 2006), and direct knowledge transfer, since in the interaction with actors and also decision-makers, the results of scientific research can be transferred directly into practice. A transdisciplinary science of urban public health meets the major

challenges with creative solutions and the involvement of actors from practice.

In this program, the research institutions systematically worked together with numerous practice partners, e.g. various ministries, the Federal Environment Agency (UBA), municipal authorities for health, social, and environmental issues, and also regional associations and health insurance organisations as well as engineering firms. By forming project consortia, the exchange of knowledge is facilitated between science and practice. The partner institutions provided practice input and critical reflection, helping to link the results to their respective fields. In the Junior Research Groups, so far, more than 10 PhD dissertations have been successfully completed and defended (Table 2). Several of the former PhD students and postdocs are now working in key positions of public health and urban development.

Table 2. Completed (German-language) PhD dissertations within the Junior research groups funded by the Berg Foundation, in chronological order.

Author	Affiliation	Year	Title of the dissertation	Access
Völker, Sebastian	University of Bonn: Geography	2012	Urban-blue health - Aspects of human well-being at urban water bodies	(via libraries)
Heiler, Angela	University of Bielefeld: Public Health	2016	The perception, use and health significance of public green spaces	Abstract & summary; full text
Baumeister, Hendrik	University of Bielefeld: Public Health	2017	Blue Governance - An opportunity for health-promoting urban development	Abstract & summary; full text
Reyer, Maren	University of Stuttgart: Economic and Social Sciences	2017	Built environment and everyday activity: Walkability as an opportunity and risk for older people walking in everyday life	Abstract & summary; full text
Schüle, Steffen Andreas	University of Bremen: Human and Health Sciences	2017	Neighbourhood context and its contribution to urban health inequalities	Abstract & summary; full text
Sieber, Raphael	Technical University (TU) Dortmund: Spatial Planning	2017	Health-promoting urban development. An analysis of urban planning instruments including the setting approach to health promotion	Summary; Volltext
Shrestha, Rehana	University of Twente (NL): Geo-Information Science	2018	Interactive map-based support systems – Supporting social learning and knowledge co-production on environmental health issues	Full text
Matros, Jasmin	Rhenish-Westphalian Technical University (RWTH) Aachen: Architecture	2019	Open space-specific well-being factors for the perception, use, and appropriation of urban open spaces	Abstract; full text
Penger, Susanne Géraldine	Goethe University Frankfurt/Main: Psychology and Sports Science	2020	Everyday mobility outside the home in old age - The role of mobility-related flexibility and routines	Full text
Waegerle, Lisa	Technical University (TU) Dortmund: Urban and Regional Planning	2021	Health-related urban conditions and justice. Insights into woven practices of thinking and knowing	Abstract; full text
Ahmadi, Yasaman	Technical University (TU) Berlin: Planning, Building, Environment	2023	Thermal comfort as a design factor for urban squares: Age- and climate-adapted urban open spaces using the example of two city squares in Stuttgart	(via libraries)
Conrad, Kerstin	Technical University (TU) Dortmund: Engineering	2023	Everyday mobility of older people in the context of spatial and climatic environment	Full text

Annual conferences ‘City of the Future’

Another aim of the research program was to promote the issue and to support the research groups by organising conferences on an annual or bi-annual basis. Additionally, public health topics were to be discussed in a broader audience with participants from science and practice, thus establishing a national platform of inter- and transdisciplinary urban public

health. For Germany, this was an innovation. Since the start of the program, a total of 10 conferences were held in 8 cities (Table 3 and Figure 2). Due to the pandemic, the conference in 2021 was held online, organized by the Universities of Bielefeld and Hamburg. Some of the conferences were comprehensively documented, e.g., the 7th conference 2021.²

Table 3. Ten Conferences within the ‘City of the Future’ funding program of the Berg Foundation since 2011, which were organised annually by the funded research groups or by members of the scientific advisory board.

Location	Year	Organising institution	Conference topic
(1) Hamburg	2011	HafenCity University of Hamburg, Dept. of Urban Planning and Regional Development	City of the Future: Green and Healthy? Sustainable and health-promoting development of urban environments in the 21 st century
(2) Bozen	2012	Free University of Bozen-Bolzano (Italy), Faculty of Science and Technology	City of the Future: Green, healthy, livable
(3) Wuppertal	2013	Institute for Climate, Environment, Energy Ltd.	Urban change as an opportunity - for climate, environment, health and quality of life
(4) Bielefeld	2014	University of Bielefeld, Faculty of Health Sciences, “Environment and Health” working group	Health-promoting urban landscapes of the future
(5) Dortmund	2016	Technical University (TU) Dortmund, Department of Urban and Regional Planning	City of the Future: Promoting Sustainability and Health Together - New Methodological Approaches
(6) Stuttgart	2017	University of Stuttgart, Institute for Sport and Exercise Science, Chair of Sport and Health Sciences I	Shaping the city of the future: Lifelong mobility in all weathers
(7) Bielefeld/ Hamburg (online) ^a	2021	University of Bielefeld, Faculty of Health Sciences, and University Medical Center Hamburg-Eppendorf (UKE)	Health and sustainable urban development in a field of tension: analyses, initiatives and planning practice
(8) Essen	2022	Institute for Urban Public Health at Ruhr University Duisburg-Essen; Institute for Urban Planning and European Urban Studies at Rhenish-Westphalian Technical University (RWTH) Aachen	Urban health landscapes of the future. Health Architecture Environment
(9) Bonn	2023	GeoHealth Centre, Institute for Hygiene & Public Health, University Hospital Bonn	Therapeutic urban landscapes under stress. Conservation, development opportunities and risks of change in a transforming world
(10) Bochum	2024	University of Applied Sciences for Health, Bochum	Healthy, sustainable Metropolises

^aJointly with the 5th Hamburg Symposium on Regional Healthcare.



Figure 2. Flyers of the (bi-)annual conferences within the “City of the Future” program.

Institute for Urban Public Health (InUPH)

On one occasion, in 2020, the funding format was opened beyond Junior Research Groups and included the alternate option of funding institutional development. As a consequence, the Institute for Urban Public Health (InUPH) at the Ruhr University Duisburg-Essen was launched. In this process, the existing Centre for Urban Epidemiology (CUE) was re-opened as a new institute at the University Hospital Essen, dedicated to Urban Health issues. This scientific institution focuses on salutogenic factors of urban systems, enabling and supporting the development and maintenance of human health. This encompasses

spatial, political, social, and ecological characteristics of the city, each with regard to specific population groups in terms of age, gender, socio-demography, migration, work, and illness.

Project ‘Building bridges between scientific disciplines and societal sectors’

Research on Urban Health comprises a multitude of subtopics, often located at the borders of several scientific disciplines. Similarly, numerous institutional actors contribute in practice to protecting and promoting the health of urban populations. In this situation, both the

integration of knowledge across disciplines, and an integrated view of actors and activities across sectors, are highly desirable.

Also, within the program ‘City of the Future’ itself, there is a need to integrate the results of individual research projects. In addition, the research groups and consortia within the program – as elsewhere – tend to be ephemeral. A need was seen to support continuity of the work. This includes, for example, maintaining access to results, over time.

As indicated by its name, the ongoing project ‘Building bridges,’ located at the University of Bielefeld, pursues the task of fostering integration and continuity both within and beyond the program ‘City of the Future.’. For this purpose, the project arranges and maintains contacts both within the program and externally. It has initiated a book series, coordinates additional publications, curates two dedicated websites (English, German), contributes contents and suggestions to the series of conferences, and is engaged in launching spin-off activities.

The ‘Sustainable Urban and Regional Health’ book series forms a core element of the project. These volumes bring together authors from academia and practice, helping to integrate specific findings. Part of the motivation for the book series reflects our ongoing usage of Urban Health books from the USA. However, the German language is much more accessible for practitioners in Germany. The book format facilitates covering multiple facets and involving large numbers of contributors with different backgrounds.

Up to now, seven volumes have been published, including several cooperative case studies on health and sustainable development in cities (Hamburg) and regions (Ruhr area) (Table 4). Several of these volumes have originated from the program ‘City of the Future.’ Others were contributed from outside researchers. The number of authors per volume ranges between two (Baumgart and Rüdiger 2022) and 100 (Fehr and Trojan 2018).

Spin-off initiatives

A key objective of this research program is to contribute to, and strengthen, overdue transformations towards

a healthier and more sustainable future in local and regional processes. Particularly, a focus of the program was laid on transdisciplinarity and knowledge transfer to practice. This was implemented by spin-off initiatives which have strengthened the cooperation between science and practice. We outline a few of such spin-off initiatives in this section.

In recent years, the Ruhr area has evolved to be a hotspot of transformative efforts towards sustainability and health. Activities include the following: a range of projects, e.g., ‘Innovations community Urban Health’ (ICUH) within the framework DATIpilot of the Bundesministerium für Bildung und Forschung (BMBF); a feasibility study on Urban Health in the Ruhr area (MUHR),³ and SalusTransform⁴ focusing an evaluation of interventions. The digital educational program ‘Urban Health digiSpace’⁵ is built on principles including an open educational program, transdisciplinarity, a transformative character, equity and diversity, and a focus on Ruhr area.

A key role for these activities is played by the University of Applied Sciences Bochum which also organized the 10th conference ‘City of the Future’ in 2024 and cooperatively produced a book on urban and regional health in the Ruhr area (Köckler *et al.* 2024). In a recent achievement, the same institution initiated the Forum ‘StadtGesundheit Ruhr,’ facilitating exchange processes in the area and coordinated the ‘Ruhr Charta on Urban Health’⁶ which has been signed by 25 regional institutions so far.

In the city state of Hamburg, at an early point of time, a large group of experts from science and practice cooperated to contribute an integrative ‘case study’ on sustainable urban health (Fehr and Trojan 2018), with topics including the local history, urban epidemiology, health care provision, prevention and health promotion, as well as ‘Health in All Policies’ (e.g. housing, transport, environment). What came to light while preparing this volume was the existence of a series of early predecessors of the integrative perspective on physiography, environment, population, and health in Hamburg (e.g. Menuret 1797, Rambach 1801).

Based on the 2018 case study, one of Hamburg’s civil society organizations agreed to launch

Table 4. Published volumes of the ‘Sustainable Urban and Regional Health’ series (with original titles and in chronological order).

Editors/authors	Year	Original title	Translated title
(1) Fehr & Hornberg (Eds.)	2018	Stadt der Zukunft – Gesund und nachhaltig. Brückenbau zwischen Disziplinen und Sektoren	City of the future - healthy and sustainable. Building bridges between disciplines and sectors
(2) Fehr & Trojan (Eds.)	2018	Nachhaltige StadtGesundheit Hamburg. Bestandsaufnahme und Perspektiven	Sustainable Urban Health in Hamburg. Inventory and perspectives
(3) Westenhöfer, Busch, Pohlan, von dem Knesebeck, Swart (Eds.)	2021	Gesunde Quartiere. Gesundheitsförderung und Prävention im städtischen Kontext	Healthy neighborhoods. Health promotion and prevention in an urban context
(4) Baumgart & Rüdiger	2022	Gesundheit in der Stadtplanung. Instrumente, Verfahren, Methoden	Health in urban planning. Instruments, procedures, methods
(5) Fehr & Augustin (Eds.)	2022	Nachhaltige StadtGesundheit Hamburg II. Neue Ziele, Wege, Initiativen	Sustainable Urban Health Hamburg II. New goals, pathways, initiatives
(6) Klockmann, Heeg, von dem Knesebeck, Härter, Lüdecke (Eds.)	2024	Gesundheitskompetenz urbaner Organisationen. Ein praxisorientiertes Handbuch	Health competence of urban organizations. A practice-oriented handbook
(7) Köckler, Hornberg, Rüdiger, Mekel (Eds.)	2024	StadtGesundheit im Ruhrgebiet I. Bestandsaufnahmen und Perspektiven	Urban Health in the Ruhr area I. Inventories and perspectives

a transdisciplinary working group ‘Sustainable Urban Health’⁷ which now provides a forum for debate. The group enables exchange processes, including the preparation of project proposals; it conducts workshops and (public) meetings; and has contributed to a second book on sustainability and health in Hamburg (Fehr and Augustin 2022).

Another spin-off activity in Hamburg is the interdisciplinary working group ‘Urban epidemiology,’ coordinated by the University hospital Hamburg-Eppendorf and the Hamburg Cancer Registry. The group initiated an overview of recent epidemiological studies concerning sustainable urban health in Hamburg. It currently aims at comparing Hamburg’s performance with a set of other European cities while also exploring the strengths and weaknesses of such ‘benchmarking’ approaches.

Stimulated by the Berg Foundation initiative and against the background of the various actors in research and practice of health and medicine in the north Italian Autonomous Province of Bozen-South Tyrol in the southern European Alps, the Transdisciplinary Environment and Health Research Network (TER) was established in 2015. Funded by the Province, several goals were achieved. Accordingly, a network with research institutions in South Tyrol and beyond (e.g. Laimburg Research Centre for Agriculture and Forestry, Südtiroler Akademie für Allgemeinmedizin, Fraunhofer Italia Research) as well as with health agencies and departments, respectively (e.g. Claudiana University for Health Professions, hospital in Bozen, Alzheimer’s Association South Tyrol, Health Dept. of the Autonomous Province of Bozen-Bolzano) was developed. Within this network information meetings were organized, current research topics in public health identified, and information on funding programs for research disseminated. Several interdisciplinary research projects were established such as on urban green spaces in cities of South Tyrol under climate-change conditions (e.g. Speak et al. 2021a, 2022), ecosystem services and disservices of urban green spaces and trees (e.g. Speak et al. 2018, 2021b), traditional medicinal plants, their use, and perception (e.g. Petelka et al. 2020, 2022, Mattalia et al. 2023), heavy metal stress in urban green spaces (e.g. Dadea et al. 2017), and edible green infrastructure in cities (e.g. Russo et al. 2017). In 2017, an international conference on water as a resource in cities was organized. Meanwhile, the network activities are under the responsibility of the South Tyrolian Health Department in Bolzano.

Discussion and outlook

This paper has presented the basic thrust and selected details of the ongoing ‘City of the Future’ research program. This program bears some similarities to large-scale activities e.g. the multifaceted TRUUD⁸ project and the

GroundsWell⁹ initiative. The 6-year TRUUD project featured both a range of research strands on urban health issues and diverse practical interventions in cities. The ongoing GroundsWell initiative is focused on community resilience building including, e.g. the countering of violent extremism. For both TRUUD and GroundsWell, the annual financial resources are roughly ten times larger than for the program described here. Up to now, ‘City of the Future’ operates with rather limited resources; it thrives on the commitment of the groups involved and on activities to ensure integration and continuity, including the conferences, the book series, and the websites. In our opinion, therefore, the main features as well as major lessons learnt are essentially transferable to other countries. The key features of the program include a strong focus on ‘integration’ across scientific disciplines and urban sectors. In particular, the program initiated an ‘ecosystem’ of persons, projects, meetings, and information infrastructure including a dedicated book series and a bilingual website. All these components are meant to foster Urban Health in a way which goes beyond traditional approaches and might contribute to the emergence of a renewed paradigm for Urban Health, as described by Grant et al. (2024). The program’s intensity and ambition would be inconceivable without its fundamental rooting in transdisciplinary co-production of knowledge, joint learning, and direct knowledge transfer, as mentioned above.

From its onset, the program has triggered a wide range of reactions. The majority of reactions over time, both from persons involved in the program and from the outside, indicated agreement with this approach, regarded as helpful to view initiatives and projects in a broader context. A large fraction of the persons formerly involved in research groups – be it Ph.D. candidates, advisors, or practice partners – keeps staying in touch, e.g. by attending conferences or contributing website information.

Also, the book series (Table 4), covering publications both from within the research program and from outside, elicits positive responses. To create ‘integrated’ local case studies of *status quo*, unmet needs and promising actions, the goal is to go beyond ‘anthologies’ and produce collective works, instead. For some contributors, the demanding requirements come as a surprise. Nevertheless, the first of such case studies, for example, succeeded in integrating the work of 100 authors. Many of them explicitly acknowledged the ‘fresh’ perspective provided by this approach, concerning both their own work and additional aspects of Urban Health. Incidentally, this volume was shortlisted for the Hamburg city state library’s annual book prize – not very common for such a specialist book publication.

The spin-off initiatives mentioned above originated from different contexts, but all of them are at least partially connected to the City of the Future program.

Analyzing their specific merits is beyond the scope of this paper, but in summary, we take their existence to indicate the overall program's effectiveness. All program modules keep being scrutinized and – where appropriate – re-designed, often in close coordination with the German Foundation Center. This funding agency appreciates the emergence of this Urban Health 'ecosystem' as mentioned above, and the improved visibility associated with it. As a consequence, this agency has been a lead force for mobilizing continued funding.

In summary, we see five main lessons learnt from this program, to date:

- (1) A clearly visible, transdisciplinary Urban Health research program can be established by bringing together a plausible vision, several (PhD) projects, and some (straightforward) elements of infrastructure, all of this with rather limited funding. In our experience, researchers, practitioners, and also sponsors are then willing to continue their engagement beyond specific projects, and to establish a lively and diverse network for Urban Health, supporting at least medium-term cooperation and exchange.
- (2) Academic excursions can help to deepen professional connections. In our own experience, especially in the preparatory phase, field trips, seminars, and student work – organized as a joint activity of (student) planners and health experts – also contributed to convincing the addressees of the value of the initial program proposal.
- (3) Working with PhD students is an obvious option. Hitherto, in our program, a high rate of PhD dissertations was completed. Probably, the small size and flexible structure of the Junior Research Groups contributed to the result. Some effort is required, of course, to ensure that – in addition to completing individual dissertations – an eye is also kept on the respective research group and even on the entire program. Nearly all PhD candidates and their advisors have welcomed the fact that the individual works are embedded in a larger context.
- (4) There is a considerable level of social cohesion among all groups involved, which is reflected, e.g. by attending the program's conferences, publishing together, contributing to the websites, or launching new projects. This is true of students, researchers, and practitioners involved in the program as well as the advisory board members.
- (5) As described above: since the original launch of the program, a number of new projects have

originated which build on the program's experiences and fit to its overall thrust, but receive funding from other sources. We see these varied spin-off developments as a substantial indication of the program's value. Although, in real-life, it is challenging to differentiate between various strands of influence and origin, these developments reflect the program's overall impact.

Without underestimating country-specific characteristics, these experience-based lessons could be useful for other countries, too. Tentative recommendations include the following:

- In the absence of comprehensive funding for a large-scale program, there is merit in bundling smaller projects and support them with some infrastructure. Some functions of larger programs like awareness-raising, networking, and generating a range of creative innovations can be achieved which might be missed without such bundling.
- In particular, bundling individual PhD dissertations into junior research groups of, say, five doctoral students plus a post-doc leader can be recommended as a useful format, because guidance and support from academic advisors is facilitated and it is also easier to establish consortia with practice partners from administration or industry, supporting the work of the group. For the program as a whole, we recommend appointing an advisory board providing support and critical-constructive guidance to the program.
- As for the infrastructure, we recommend introducing some elements which are identifiable as belonging to the Urban Health program; e.g. a longer-running event series. Publications (especially cooperative ones) should reveal that they belong together in terms of content and program; and there should be curated web content which does not go down with individual projects. Not only external visibility and continuity, but also cohesion among participants and initiation of new collaborative projects can all be supported by such infrastructure.

As the titles of the program's research groups, dissertations and conferences indicate, the topic of governance is clearly represented here. Nevertheless, to promote '(Urban) Health in All Policies', a better understanding of governance problems and respective solutions remains a key desideratum, involving actors, legal bases, and methodological repertoires.

Scrutinizing specific contents of the dissertations and conferences is beyond the scope of this paper. Instead, this paper is hoped to elicit responses,

especially because the research program is still ongoing and can take up suggestions from outside. We are looking forward to an exchange on experiences with similar programs, stepping into a constructive discussion. In a nutshell, urban environments throughout the world have to be improved as healthy living environments for humans, involving all actors and stakeholders in close cooperation with science.

Notes

1. <https://sdgs.un.org/goals/goal11>
2. <https://biocoll.uni-bielefeld.de/index.php/nsg/article/view/1063/1128>
3. www.hs-gesundheit.de/forschung/abgeschlossene-projekte/muhr-urban-health-im-ruhrgebiet
4. <https://gesundheitscampus.hochschule-bochum.de/aktuelles/details/salustransform>
5. <https://urbanhealth-digispace.de/>
6. https://gesundheitscampus.hochschule-bochum.de/fileadmin/user_upload/Forschung/Stadtgesundheit/Ruhr_Charta_StadtGesundheit_final_online.pdf
7. www.patriotische-gesellschaft.de/arbeitskreis-nachhaltige-stadtgesundheit
8. TRUUD = Tackling the Root causes Upstream of Unhealthy Urban Development, <https://www.truud.ac.uk/>
9. <https://www.groundswellproject.org/>, <https://groundswellfund.org/>, <https://groundswellactionfund.org/>

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References

- Barsties, L.S., *et al.*, 2025. Residents' perceptions of urban densification and health - a systems dynamics approach. *BMC public health*, 25 (1), 1473. doi:10.1186/s12889-025-22390-3.
- Barton, H. and Grant, M., 2013. Urban planning for healthy cities. *Journal of urban health*, 90 (S1), 129–141. doi:10.1007/s11524-011-9649-3.
- Baumgart, S. and Rüdiger, A., 2022. Gesundheit in der Stadtplanung. Instrumente, Verfahren, Methoden. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 4. München: Ökom Verlag, 1–485.
- Dadea, C., *et al.*, 2017. Tree species as tools for biomonitoring and phytoremediation in urban environments: a review with special regard to heavy metals. *Arboriculture & urban forestry*, 43 (4), 155–167. doi:10.48044/jauf.2017.014.
- Fehr, R. and Augustin, J., eds. 2022. Nachhaltige Stadtgesundheit Hamburg II. Neue Ziele, Wege, Initiativen. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 5. München: Ökom Verlag, 1–480. doi:10.14512/9783962389512.
- Fehr, R. and Hornberg, C., eds. 2018. Stadt der Zukunft – gesund und nachhaltig. Brückenbau zwischen Disziplinen und Sektoren. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 1. München: Ökom Verlag, 1–384. doi:10.14512/9783962385064.
- Fehr, R. and Trojan, A., eds. 2018. Nachhaltige Stadtgesundheit Hamburg. Bestandsaufnahme und Perspektiven. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 2. München: Ökom Verlag, 1–568. doi:10.14512/9783962384845.
- Goldstein, G., Rossi-Espagnet, A., and Tabibzadeh, I., 1995. How the World Health Organization supports urban health development. In: T. Harpham and M. Tanner, eds. *Urban health in developing countries: progress and prospects*. London: Earthscan, 110–122.
- Grant, M., *et al.*, 2024. The emergence of a modern paradigm for urban health. *F1000Research*, 13, 987. doi:10.12688/f1000research.154294.1.
- Hornberg, C. and Fehr, R., 2022. Gesundheit und nachhaltige Stadtentwicklung. Lebenswerter durch Vernetzung. *Politische Ökologie*, 168, 59–64.
- Huang, K., *et al.*, 2025. Declining urban density attenuates rising population exposure to surface heat extremes. *Scientific reports*, 15 (1), 13860. doi:10.1038/s41598-025-96045-z.

- Klockmann, I., et al., eds. 2024. Gesundheitskompetenz urbaner Organisationen. Ein praxisorientiertes Handbuch. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 6. München: Ökom Verlag, 1–208. doi:10.14512/9783987263255.
- Köckler, H., et al., eds. 2024. StadtGesundheit im Ruhrgebiet I. Bestandsaufnahmen und Perspektiven. *Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 7. München: Ökom Verlag, 1–304. doi:10.14512/9783987264115.
- Kuddus, M.A., Tynan, E., and McBryde, E., 2020. Urbanization: a problem for the rich and the poor? *Public Health reviews*, 41 (1), 1. doi:10.1186/s40985-019-0116-0.
- Mattalia, G., et al., 2023. Temporal changes in the use of wild medicinal plants in Trentino-South Tyrol (Northern Italy). *Plants*, 12 (12), 2372. doi:10.3390/plants12122372.
- Menuret, J.J., 1797. *Essai sur la ville d’Hambourg considérée dans ses rapports avec la santé ou lettres sur l’histoire medico-topographique de cette ville*. Hambourg: Pierre Chateauf.
- Pahl-Wostl, C., 2006. The importance of social learning in restoring the multifunctionality of rivers and floodplains. *Ecology and society*, 11 (1), 10. doi:10.5751/ES-01542-110110.
- Petelka, J., et al., 2020. Traditional medicinal plants in South Tyrol (northern Italy, southern Alps) – biodiversity and use. *Journal of ethnobiology and ethnomedicine*, 16 (1), 74. doi:10.1186/s13002-020-00419-8.
- Petelka, J., et al., 2022. Conservation with local people: medicinal plants as cultural keystone species in the Southern Alps. *Ecology and society*, 27 (4), 14. doi:10.5751/ES-13510-270414.
- Rambach, J.J., 1801. *Versuch einer physisch-medizinischen Beschreibung von Hamburg*. Hamburg: Carl Ernst Bohn.
- Russo, A., et al., 2017. Edible green infrastructure: an approach and review of provisioning ecosystem services and disservices in urban environments. *Agriculture, ecosystems & environment*, 242, 53–66. doi:10.1016/j.agee.2017.03.026.
- Scholz, R.W. and Steiner, G., 2015. The real type and ideal type of transdisciplinary processes: part II - what constraints and obstacles do we meet in practice? *Sustainability science*, 10 (4), 653–671. doi:10.1007/s11625-015-0327-3.
- Seidl, R., et al., 2013. Science with society in the Anthropocene. *Ambio*, 42 (1), 5–12. doi:10.1007/s13280-012-0363-5.
- Sell, K., et al., 2022. Multi-, inter-, and transdisciplinarity within the public health workforce: a scoping review to assess definitions and applications of concepts. *International journal of environmental research and public health*, 19 (17), 10902. doi:10.3390/ijerph191710902.
- Simon, D., 2021. Co-productive tools for transcending the divide: building urban–rural partnerships in the spirit of the New Leipzig Charter. *Land*, 10 (9), 894. doi:10.3390/land10090894.
- Siri, J.G., 2016. Sustainable, healthy cities: making the most of the urban transition. *Public health reviews*, 37 (1), 22. doi:10.1186/s40985-016-0037-0.
- Speak, A., et al., 2018. An ecosystem service-disservice ratio: using composite indicators to assess the net benefits of urban trees. *Ecological indicators*, 95, 544–553. doi:10.1016/j.ecolind.2018.07.048.
- Speak, A., et al., 2021a. Forehead temperatures as an indicator of outdoor thermal comfort and the influence of tree shade. *Urban climate*, 39, 100965. doi:10.1016/j.uclim.2021.100965.
- Speak, A., et al., 2021b. #Urbanforest: cultural ecosystem services of urban trees through the lens of Instagram. *Journal of place management and development*, 14 (4), 497–513. doi:10.1108/JPM-D-2020-0079.
- Speak, A.F., et al., 2022. The impact of different tree planting strategies on ecosystem services and disservices in the piazzas of a northern Italian city. *Urban ecosystems*, 25 (2), 355–366. doi:10.1007/s11252-021-01158-8.
- UN DESA, 2018. *United Nations, Department of Economic and Social Affairs, Population Division – World Urbanisation Prospects 2018, UN DESA - World Urbanisation Prospects, download file “WUP2018-F02-Proportion_Urban”*. [Accessed 18 Jul 2025].
- Ustaoglu, E. and Collier, M.J., 2018. Farmland abandonment in Europe: an overview of drivers, consequences, and assessment of the sustainability implications. *Environmental reviews*, 26 (4), 396–416. doi:10.1139/er-2018-0001.
- Van der Sluis, T., et al., 2016. Changing land use intensity in Europe – recent processes in selected case studies. *Land use policy*, 57, 777–785. doi:10.1016/j.landusepol.2014.12.005.
- Westenhöfer, J., et al., eds. 2021. *Gesunde Quartiere. Gesundheitsförderung und Prävention im städtischen Kontext. Edition Nachhaltige Gesundheit in Stadt und Region*. Vol. 3. München: Ökom Verlag, 1–310.
- World Bank Group, 2025. Urban population (% of total population) – European Union. Available from: <https://data.worldbank.org/indicator/SP.URB.TOTL.IN.ZS?locations=EU> [Accessed 18 July 2025].
- Yan, Y., Liu, H., and He, C., 2021. How does urban sprawl affect public health? Evidence from panel survey data in urbanizing China. *International journal of environmental research and Public Health*, 18 (19), 10181. doi:10.3390/ijerph181910181.
- Zerbe, S., 2022. Restoration of multifunctional cultural landscapes. Merging tradition and innovation for a sustainable future. *Landscape series*, 30, 1–716. doi:10.1007/978-3-030-95572-4.
- Zerbe, S., et al., 2023. Research program “City of the Future - healthy and sustainable metropolises”. *Gesundheitswesen*, 85 (S 05), S270–S277. doi:10.1055/a-2156-4244.
- Zerbe, S., 2023. *Restoration of ecosystems – bridging nature and humans. A transdisciplinary approach*. Berlin, Heidelberg: Springer Spektrum. doi:10.1007/978-3-662-65658-7.
- Zerbe, S., 2025. Junior research groups: a promising format for PhD qualification. *European educational research journal*, 25 (2), 241–252. doi:10.1177/14749041251322820.