Making co-creation a trustworthy methodology for closing the implementation gap between knowledge and action in health promotion: the Health CASCADE project.

Verloigne Maïté[1], Altenburg Teatske[2], Cardon Greet[3], Chinapaw Mai[4], Dall Philippa[5], Deforche Benedicte[6], Giné-Garriga Maria[7], Lippke Sonia[8], Papadopoulos Homer[9], Pappa Dimitra[10], Sandlund Marlene[11], Schreier Margrit[12], Wadell Karin[13], Chastin Sebastien[14]

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[1]Department of Public Health and Primary Care, Ghent University, Corneel Heymanslaan 10, 9000 Ghent, Belgium

[2]Department of Public and Occupational Health, Amsterdam Public Health Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

[3]Department of Movement and Sports Sciences, Ghent University, Ghent, Belgium

[4]Department of Public and Occupational Health, Amsterdam Public Health Research Institute, Amsterdam UMC, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands

[5]School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, UK

[6]Department of Public Health and Primary Care, Ghent University, Ghent, Belgium

[7]Department of Physical Activity and Sport Sciences, Faculty of Psychology, Education and Sport Sciences (FPCEE) Blanquerna, Ramon Llull University, Barcelona, Spain; Department of Physiotherapy, Faculty of Health Sciences Blanquerna, Ramon Llull University, Barcelona, Spain

[8]Department of Psychology & Methods, Jacobs University Bremen, Bremen, Germany

[9]Institute of Informatics and Telecommunications, National Center for Scientific Research 'Demokritos', Attiki, Greece

[10]National Center for Scientific Research 'Demokritos', Greece

[11]Department of Community Medicine and Rehabilitation, Umeå University, Umeå, Sweden

[12]Department of Psychology & Methods, Jacobs University Bremen, Bremen, Germany

[13]Department of Community Medicine and Rehabilitation, Umeå University, Umeå, Sweden

[14]Department of Movement and Sports Sciences, Ghent University, Ghent, Belgium; School of Health and Life Sciences, Glasgow Caledonian University, Glasgow, UK

Corresponding author(s):

Maïté Verloigne, Department of Public Health and Primary Care, Ghent University, Corneel Heymanslaan 10, 9000 Ghent, Belgium. Email: maite.verloigne@ugent.be

*B Deforche is also affiliated to Faculty of Physical Education and Physical Therapy, Vrije Universiteit Brussel, Brussels, Belgium

The promotion of a healthy lifestyle and the creation of supportive environments are necessary to decrease the burden of disease on society. Therefore, we need interventions that work and are efficient, sustainable, inclusive and equitable (Shelton 2014; Hallal et al., 2012). However, existing public health interventions generally have small effects and only a few are implemented on a large scale. Moreover, those that are widely implemented, tend to fail to replicate in the real world effects that were found under more controlled conditions. This is also known as the implementation gap (Green, 2006; McKay et al., 2019). One of the reasons for the implementation gap might be an overreliance on Mode 1 research (Gibbons, 2000). Mode 1 research has the aim to produce universal knowledge and is characterized by theory building and testing. It is predominantly driven by the autonomy of researchers and their host institutions (Gibbons, 1994). Our scientific practices purposely control conditions and this might result in knowledge that is too disconnected from the complexity of the real world to design effective and sustainable interventions. Thus frameworks or protocols have been developed to take into account complex influences and interrelations of real-world factors on public health problems during the development, implementation and evaluation of interventions (Moullin et al., 2020; Skivington et al., 2021). Furthermore, more emphasis is now placed on implementation science to identify barriers and facilitators when implementing interventions (Nilsen, 2015). However, the focus is still predominantly on “translating” knowledge to the real world, instead of producing it in the real world (Greenhalgh, 2016).

An alternative is therefore to rely more strongly on Mode 2 research which has the aim to produce knowledge in the context of application (Gibbons, 1994; Gibbons, 2000). Community-Based Participatory Research and Participatory Action Research, for example, can be situated within Mode 2 (Greenhalgh et al., 2016). These approaches focus on developing relevant solutions for a local problem in a specific context, generating collaborative knowledge and establishing an equitable partnership with stakeholders in the real world. Both share the core principles of participation, dialogue, and empowerment of the populations at interest (Baum et al., 2006; ICHPR, 2013; Israel et al., 2010; Macauly, 2016). There is already a long tradition of participatory research (Macauly, 2016), but it is only recently that there has been an increasing global interest in using a participatory approach in public health (Leask et al., 2019). In the public health domain, the population at interest and other relevant stakeholders are generally only partly involved during the research process, and predominantly through consulting or informing. To date, very few projects have considered them as co-decision makers throughout the entire research process (Macauly, 2016). Therefore, we advocate

for a “collaborative public health intervention development, implementation and evaluation by academics working alongside other stakeholders”, which has been described as co-creation by Leask and colleagues (2019). However, using co-creation in public health brings challenges. Because co-creation leads to locally relevant evidence, it lacks the universality and reproducibility of evidence provided by Mode 1 research approaches (Shelton, 2014; Higgings and Green, 2008). In addition, its flexible and adaptive nature is challenging in terms of rigor and transparency of the research (Goodyear-Smith et al., 2015). Currently, there is no extensive framework or protocol for co-creation in the development, implementation and evaluation of interventions in public health, although this is of major importance to guide researchers and stakeholders throughout the whole co-creation process (Jackson and Greenhalgh, 2015; Leask et al., 2019; Greenhalgh et al., 2016; Macauly, 2016).

Thus there is a clear need to combine real-world co-creation with rigorous research into evidence-based co-creation, i.e., a methodology grounded in evidence, based on both scientific precepts and the principles of a participatory approach. One example is the preliminary work of Leask and colleagues in which some principles and recommendations for co-creation in public health have been laid out and in which the PRODUCES framework has been introduced as a way of planning the co-creation of a public health intervention (Leask et al., 2019). Another example is the establishment of the International Collaboration for Participatory Health Research (ICPHR), an international scientific network collaboration open to stakeholders with the aim to strengthen the role of participatory research in interventions and decision-making on health problems and to improve its quality, credibility and impact on policy and practice (ICHPR, 2013).

To go beyond the state of the art and to deliver an innovative and comprehensive research programme on co-creation methodology, we have set up the Health CASCADE project, a European-funded H2020 Marie Sklodowska-Curie Innovative Training Network (ITN) project that started in January 2021 (https://healthcascade.eu). More specifically, Health CASCADE aims to develop the methodological foundation of evidence-based co-creation with a focus on both science and praxis: theory (ontology and epistemology), ethics, methods and evaluation (scaling up and impact evaluation) and the creation of innovative digital technologies to support co-creation processes. Indeed, co-creation can be enhanced in conjunction with the affordances of novel evidence-based information technologies (Manzoni et al., 2021) and Health CASCADE will therefore investigate whether Artificial Intelligence can be a tool within the co-creation process to help with transcending human limits, synthesizing knowledge, and keeping the co-creation process democratic and free of bias. The co-creation methodology, supported by Artificial Intelligence, will be tested in four settings: schools, workplaces, health care and the community. Based on the scientific work of Health CASCADE, the final aim is to

develop a training programme for researchers on how to conduct evidence-based co-creation for public health. In conclusion, with this project we promote the conduct of co-creation as a transparent, trustworthy and evidence-based methodology to improve public health interventions, while training a new generation of researchers who will in turn "cascade" this knowledge to other researchers and stakeholders within public health.

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