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Supplement Article

Coproduction to improve preventive health services—experiences from Germany

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Summary

Due to the beneficial impact of regular physical activity (PA) on non-communicable diseases, the number of countries integrating exercise referral schemes (ERSs) into their healthcare systems is growing. Owing to the limitations of existing PA promotion concepts in Germany's healthcare system, efforts are currently being made towards developing a nationwide referral pathway. A research group at the Friedrich-Alexander-University Erlangen-Nürnberg is coordinating these efforts within a project funded by the Federal Ministry of Health. The aim is to develop, implement and evaluate a regional-level ERS that has the potential to be scaled up across Germany in the event of its demonstrated effectiveness. The project is based on an adapted Cooperative Planning approach requiring interaction between the academic sector and different actors of the healthcare sector. The present commentary reflects on challenges faced in the early stages of the co-production process. Besides the development of an adequate co-production methodology, it critically discusses stakeholder participation, knowledge gaps and actors' willingness to take responsibility. In addition, although patients are represented by dedicated organizations, their perspective cannot be adequately captured using a co-production approach. Despite the joint development of an ERS, there remain important questions regarding the appropriateness of the co-production approach in a healthcare setting.

Lay Summary

Regular physical activity (PA) reduces one's risk of developing various diseases and also plays a favourable role in managing symptoms and preventing further complications. Nationally and internationally, there exist different concepts on how to increase PA in the population at large. The Friedrich-Alexander-University Erlangen-Nürnberg is currently working on a project that focuses on promoting PA in primary care. This project involves collaboration among various actors in the German healthcare system, such as healthcare insurances, representatives of physicians, patients and exercise specialists, who represent different interests and are experts in their fields of knowledge. During this process, various barriers have come to light, which yield important lessons for further studies. For example, there are differences in actors' levels of knowledge of the healthcare system and their willingness to take responsibility and initiative in the collaborative process. This article should give an impression of the joint development of exercise referral schemes, show the strengths and weaknesses and encourage exchanges of similar experiences of co-production processes.

Key words: physical activity promotion, exercise referral scheme, co-production process, non-communicable diseases, primary healthcare

INTRODUCTION

Physical activity (PA) has been proven to aid in the treatment of non-communicable diseases (NCDs) (World Health Organization, 2018). For individuals with NCDs, regular PA provides substantial health benefits, including improvements in symptoms, increases in physical fitness and quality of life and reduced morbidity and mortality (Pedersen and Saltin, 2015). Accordingly, regular PA is recommended to all individuals with NCDs (Geidl *et al.*, 2020). Nonetheless, the prevalence of PA remains low among these individuals (Brawner *et al.*, 2016; Barker *et al.*, 2019).

In response, exercise referral schemes (ERSs) have evolved and become an important means of promoting PA among individuals with NCDs in primary healthcare internationally. An ERS conventionally operates by defining a process within the healthcare system that guides patients towards an exercise programme and monitors their success in becoming physically active. Commonly, a general practitioner or practice nurse screens a patient, identifies the patient's need to be physically active and refers the patient to an exercise professional (Dugdill *et al.*, 2005). On the basis of a medical and exercise-related assessment, this exercise professional enrols the patient in a supervised exercise programme (Dugdill *et al.*, 2005), which is sometimes complemented with individually tailored PA counselling, re-assessments and progress monitoring (Sørensen *et al.*, 2007; Murphy *et al.*, 2012). Upon completing the programme, the patient is either released from the programme or, if deemed necessary, re-referred for another round of counselling or exercise. Although there is evidence of the potential for ERSs to increase PA levels, this effect appears to be rather modest (Campbell *et al.*, 2015; Onerup *et al.*, 2019). However, due to the potential of ERSs to reach a large number of patients, their public health impact might still be significant (Estabrooks and Gyurcsik, 2003; Eakin *et al.*, 2005). Also, whether participants take up an ERS and the extent to which they adhere to the program are two important factors influence its effectiveness (Pavey *et al.*, 2012). The pooled uptake and adherence rates derived from randomized controlled studies and observational ones have been reported to be low (66 and 81% uptake rate; 43% and 49% adherence rate) (Pavey *et al.*, 2012), thus the modest effects of ERS might be partially attributed to these two factors.

Germany appears to be somewhat late in adopting ERSs in routine medical practice. Although some schemes have been piloted, due to several contextual factors, large-scale implementation is still lacking. One reason for this might be that PA promotion responsibilities are shared among different political institutions at the national, federal, regional and local levels (Rütten *et al.*, 2018). Moreover, as of 2020, there are 105 statutory health insurance which are heavily regulated at the federal level (GKV-Spitzenverband, 2020). This shared responsibility for healthcare and preventive services (including PA promotion) has been described as rather fragmented and yielding somewhat uncoordinated results (Gohres and Kolip, 2017). Gohres and Kolip (Gohres and Kolip, 2017) argue that this necessitates change towards strengthening and coordinating all responsible levels and PA promotion initiatives towards a joint national action that can result in more effective and sustainable PA promotion. Underlying this, the German healthcare system has been described as having a rather curative orientation (Lassey *et al.*, 1997), but it has recently strengthened preventive actions (Rütten *et al.*, 2018) through a Federal Prevention Law (Bundestag, 2015).

This commentary reflects the experience of co-producing and implementing an ERS within the German healthcare system. The BewegtVersorgt project was funded by the Federal Ministry of Health in 2019 with the objective of developing and implementing an ERS in one region, testing its efficacy and outlining steps for its scale-up to other regions. The University of Erlangen-Nürnberg (Friedrich-Alexander-University; FAU) is leading the project and has designed the co-production process utilized to develop the ERS. The project comprises the following phases. The first and second phases have been devoted to co-production of the ERS. Twelve organizations taking part in the co-production process include two health insurance providers, representatives of physicians/general practitioners, representatives of exercise professions, representatives of patient rights and a centre of patient education. These organizations are important actors in the German healthcare system and represent different perspectives that are promising for a joint development process and the systemic establishment of the referral scheme. As part of the co-production process, stakeholders from these organizations took part in bilateral talks and three half-day

workshops organized by FAU. At these workshops, stakeholders and researchers jointly planned the ERS. In the third phase, the planned ERS will be piloted in one region. This pilot is subsidized by the two participating health insurance providers, and FAU and an external agency will evaluate its effectiveness in increasing PA among patients. For the fourth phase, it is planned that (if effectiveness is demonstrated) the project group will develop and present plans to the Federal Ministry of Health on how to expand the ERS to other regions and incorporate it into routine healthcare practice in Germany.

This article reports some of the strengths and challenges encountered in the co-production process of the ERS and lessons learned from this process from an academic perspective. It adds to recent literature assessing the merits and limitations of co-production for health research (Oliver *et al.*, 2019; Williams *et al.*, 2020) and is intended to stimulate reflections on how to actually co-produce knowledge in health research.

LESSON 1: IT IS CHALLENGING TO DECIDE ON A PROCESS OF CO-PRODUCTION

The researchers started the process of co-production with the intention of following the methodology of Cooperative Planning (Rütten and Gelius, 2014). As a co-production methodology, Cooperative Planning is expert-based, well suited for smaller groups of stakeholders (15–20 persons) and, importantly, facilitates the development and implementation of actions. The researchers had good prior experience of using this methodology in several past projects, and it seemed appropriate for the task ahead. This approach can also be confirmed by international models that also developed a pathway via co-production methods (Björkqvist, 2018; Buckley *et al.*, 2018).

However, from the outset, the researchers realized that the application of Cooperative Planning in BewegtVersorgt might face some limitations. First, they were not sure that all stakeholders taking part in the project were truly committed to developing an ERS. Employing a consensus-based co-production process, such as Cooperative Planning, could provide ample opportunities for one party (who might be inclined to pursue other organizational interests) to slow down the project. In a past project applying Cooperative Planning, the researchers had witnessed this (Rütten and Gelius, 2014).

Second, due to the complexity of implementing such a referral scheme, the researchers were under the impression that any co-production process would need to include a phase that would provide all parties with expert knowledge on the task ahead (e.g. how do ERSs in general operate, what is the evidence base for such schemes to promote PA, how are other countries organizing such schemes?). Cooperative Planning, however, initiates co-production with a rather open brainstorming phase to increase all stakeholders' motivation and sense of ownership and, as such, would not ensure a more structured phase.

Finally, it was apparent from the outset that the two health insurance providers would play a key role in the co-production process, since they would ultimately have a say in the implementation of the ERS and would need to cover most of its costs. As Cooperative Planning treats all stakeholders as equals, the researchers recognized the difficulty of potentially having to accommodate the health insurance within this co-production methodology.

Thus, the researchers identified scenario thinking as a co-production methodology that could be suitable for overcoming some of the aforementioned limitations of Cooperative Planning (Scearce and Fulton, 2004). In comparison to Cooperative Planning, scenario thinking starts with those managing the co-production process presenting a vision, thereby facilitating experts' management of the co-production process. In successive sessions, this vision is discussed and refined. Like Cooperative Planning, the purpose of scenario thinking is to develop and implement actions agreed upon during the co-production process. The researchers felt that employing scenario thinking in BewegtVersorgt would allow for sketching out the ERS through bilateral contacts with the different stakeholders before it would be fed into the workshops and presented to all stakeholders. Such a procedure would also provide the health insurance with opportunities to adapt the ERS to their needs.

Ultimately, a mixture of Cooperative Planning and scenario thinking was employed to develop the ERS. First, the researchers engaged in bilateral talks with all involved stakeholders. During those discussions, the stakeholders were asked to sketch out their vision for an ERS as well as the facilitators and barriers they foresaw in implementing such a scheme. Second, at the first workshop, the researchers presented some of these ERSs and the common elements among most of them. Between workshops, the researchers engaged in more bilateral talks, in particular with the health insurance providers, to plan the successive workshops and solicit opinions on what had been achieved regarding the planned ERS. Compared to Cooperative Planning, this process required the researchers to engage much more

actively in designing the referral scheme, but it also seemed like an appropriate means of decreasing the risk of failure to agree on a scheme.

Reflecting upon the co-production process, it proved important to constantly adapt the process to develop and ultimately obtain consent on an ERS. Rather than following a pre-scripted plan, the researchers engaged in numerous bilateral talks and last-minute revisions of the agendas for the workshops.

LESSON 2: DESPITE THE INVOLVEMENT OF SO MANY STAKEHOLDERS, KNOWLEDGE GAPS EXIST

At the workshops, the researchers realized that numerous healthcare services exist in Germany that partially overlap with the intended ERSs. Some of those services provide exercise (more often rehabilitative) and physiotherapy to patients. However, there seemed to be no stakeholder in the room who had expert knowledge of all existing schemes or data on how common the different schemes are, how much they cost (per patient or in total) or how effective they are.

Interestingly, the group of stakeholders was well aware of this potential shortcoming, and the researchers discussed this point several times in meetings to prepare for the workshops ('Maybe there is one person who has all the information we need?'; 'Maybe we should try to find this person and invite them?'). Efforts were made to contact additional experts, such as a representative of the umbrella organization for German health insurance providers, but ultimately no such person could be identified and the planning process just moved on. It seemed to surprise no one that expert knowledge of the German healthcare system was apparently lacking and that stakeholders had adjusted accordingly. What the researchers witnessed might also be relevant for other co-production processes, in particular in the healthcare setting. Regardless of the specific approach chosen, it might remain difficult to select experts/stakeholders to join co-production processes or, even more so, to know beforehand which expertise might be needed in the process. Taking this into consideration, it might nevertheless make sense for research groups to integrate a more careful analysis on which expertise might be needed within the co-production process as part of the preparation of such projects.

However, beyond such difficulties, this issue might well reflect the nature of the German healthcare system as a highly complex bureaucracy. Due to high pressure for (cost) rationalization, the German healthcare system is certainly part of what Weber (Weber and Kalberg, 2013) calls the 'modern economic order', presenting itself to stakeholders as an 'iron cage' that restricts individual and institutional degrees of freedom. Foucault (Foucault, 1995) convincingly shows that institutions (acting in the healthcare system) are well able to control and, if necessary, discipline their members. As such, it might not come as a surprise that members display what Simon (Simon, 1979) refers to as a rather 'bounded rationality' in all decision-making processes: the knowledge to which they have access is strongly shaped by the organization to which they belong.

LESSON 3: IT IS DIFFICULT TO INTEGRATE THE PERSPECTIVE OF PATIENTS IN THE CO-PRODUCTION PROCESS

From the beginning, the researchers deemed it highly important for the ERS to reflect the needs of those patients for which it is intended. Thus, stakeholders from two patient organizations (German Diabetes Aid Organization and German Rheumatism Alliance of Bavaria) were invited to join the project and take part in the co-production process. At certain points, however, it seemed that the patient organizations' perspective on the needs of patients with NCDs was somewhat limited and that the co-production process could have benefitted from the direct involvement of patients with NCDs. However, due to the nature of the chosen methodology (workshops during the daytime, mostly attended by professionals as representatives of their organizations), this was deemed not to be feasible.

This shortcoming might partly reflect the weakness of the methodology employed (i.e. making it difficult to engage true end-users), but it might also point towards the underlying issue of how to balance co-production and participation. In the tradition of participatory research, higher degrees of participation automatically come with higher degrees of control and, thus, require permanent shifts of power from professionals to laypeople (Arnstein, 1969). Regarding the concept of co-production, the objective seems to be much more practical—co-producing knowledge, rather than permanently altering power structures. Since BewegtVersorgt was not intended to alter power structures, the absence of end-user involvement in the process is arguably excusable. From the perspective of participatory research, however, it would be seen as a rather strong limitation. In contrast to our work, five patients were involved in a similar co-production process carried out by a group of researchers from the UK (Buckley *et al.*, 2018). Patients seem to

have given valuable input in the multidisciplinary debate during development meetings, shaping the ERS framework according to their needs and perspectives. Starting the co-production process with an analysis of the end-users needs served as a facilitator (Buckley *et al.*, 2018). Moreover, the authors reported that all the participating stakeholders, including patients, 'felt they had been given the opportunity to share their views', giving them a sense of ownership for the final ERS (Buckley *et al.*, 2018). This experience reveals that the process of co-production may benefit from the inclusion of the ERS intended end-users. However, this benefit does not come without its own set of challenges, such as contrasting views, irregular attendance and (mis)perceptions of the evaluation (Buckley *et al.*, 2018).

LESSON 4: CO-PRODUCTION MIGHT NOT BE ABLE TO OVERCOME THE ISSUE OF LEADERSHIP

From the beginning of the co-production process, the researchers observed that the involved stakeholders were reluctant to commit the healthcare- and exercise-related professions that they were representing to actively engage in the scheme. The reasons voiced at the workshops for not wanting to play a central role in the scheme were fairly similar: concerns about their professionals taking on additional tasks for limited or no reimbursement or taking on tasks for which their professionals might not be fully qualified.

Instead, the strategy of many involved stakeholders was to propose that a new type of healthcare professional would need to be established to run the ERS. Although, there was some ambiguity about who this person should be and what type of qualification(s) this person would need to have.

Within the co-production process of international ERS, similar barriers to implementation (e.g. time and financial resources) were brought up by health professionals (Buckley *et al.*, 2020b), although the importance of promoting PA was in general acknowledged (Din *et al.*, 2015).

This may touch upon a more common dilemma of co-production processes—namely, that there is ultimately still a need for people to take the lead and implement the co-produced products. Ideally, this happens automatically, since the intrinsic motivations of everybody involved are high, but the representatives of different organizations may still weigh the costs and benefits of taking such a lead.

Beyond such limitations of co-production processes, there is a body of literature on organizational readiness that might explain the reluctance of stakeholders to implement the ERS. Greenhalgh *et al.* (Greenhalgh *et al.*, 2004) show that the adoption of innovations in organizations depends on factors such as the organization's readiness for innovation and capacity to integrate new knowledge in its system. In addition, external resources and, obviously, the character of the innovation itself will determine if the organization adopts it. Other studies have theorized (May *et al.*, 2007) that additional factors, such as stakeholders' confidence in the innovation (e.g. that it is safe to carry out), how it relates to the organization's existing practices (relational integration) and the knowledge required to implement the innovation, might play a crucial role in the decision of stakeholders to adopt new practices in their organization.

LESSON 5: DESPITE ALL THOSE LIMITATIONS, IT STILL WORKS!

Despite the aforementioned limitations, the co-production applied in BewegtVersorgt achieved its goal, and all stakeholders consented to an ERS at the end of the last workshop. The agreed upon scheme starts at the general practitioner's clinic with a short screening. Inactive patients who might benefit from PA receive a short individualized consultation with the general practitioner, who additionally refers them to trained exercise professionals via a referral form. After an initial assessment, the exercise professional offers a series of individualized one-on-one PA counselling sessions aimed at supporting the patient in increasing their PA level. Parallel to this, the patient is transferred to suitable existing local PA programmes to ensure their long-term adoption of PA in daily life. At the end of the programme, the exercise professional conducts two follow-up assessments and provides feedback to the referring general practitioner.

All stakeholders evaluated the co-production process and expressed a quite favourable view, with 85% having a very positive impression of the course of the co-production meetings and the rest rating them as good.

As such, the project compares well to other coproduced ERS that reported promising potential results (Buckley *et al.*, 2019, 2020a). In this particular study, a coproduced ERS (as compared to a usual ERS and no intervention), showed significant positive effect on cardiorespiratory fitness and vascular health at 12 weeks (Buckley *et al.*, 2020a). However, ERS participation was not associated with significant change on objectively measured PA level at 12 and 6 months. However, these

results might be undermined by a small sample size (Buckley *et al.*, 2020a).

CONCLUSION

The experience of this co-production process for planning an ERS with stakeholders from German healthcare organizations has raised some issues. In summary, first, this commentary has argued that it is challenging to determine the most appropriate co-production process. Second, there is a knowledge gap among stakeholders despite the varied expertise they bring to the table. Third, integrating the perspective of patients poses challenges that remain difficult to solve via a co-production process. Fourth, co-production might not be able to overcome the issue of leadership. Finally, despite the challenges encountered during the process, the co-production worked.

Despite the success of the co-production process, the researchers repeatedly perceived it as being only vaguely defined and rather fluid. Therefore, we would like to encourage discourse on how to improve our repertoire of co-production approaches across projects. Potentially, this would, as a first step, require the development of a standard of reporting (such as CONSORT (Schulz *et al.*, 2010) or TiDiR (Hoffmann *et al.*, 2014) are used in other fields) that would facilitate an exchange on co-production processes. Moreover, we experienced, as other projects may have also experienced, difficulty in involving target groups (here, patients with NCDs) in the co-production process. We would like to encourage an exchange on potentially successful strategies to overcome this. Finally, our experience might have partially been shaped by the particularities of the German healthcare system, the organizations and the stakeholders in this sector. Due to its abundance of regulations and red tape, the healthcare sector might not be very conducive to co-production processes. To address this aspect, we would like to encourage an exchange of experiences in the context in which co-production processes take place.

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COMPETING INTERESTS

The authors declare no conflict of interest.

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ETHICAL APPROVAL

Ethical approval was granted by the ethics committee of the Friedrich-Alexander-University Erlangen-Nürnberg [331_20 B].

REFERENCES

Arnstein, S. R. (1969) A ladder of citizen participation. *Journal of American Planning Association*, **4**, 216–224.

Barker, J., Smith Byrne, K., Doherty, A., Foster, C., Rahimi, K., Ramakrishnan, R. *et al.* (2019) Physical activity of UK adults with chronic disease: cross-sectional analysis of accelerometer-measured physical activity in 96 706 UK Biobank participants. *International Journal of Epidemiology*, **48**, 1167–1174.

Björkqvist, J. (2018) Co-production – a 'game changer' in designing exercise referral schemes to meet local needs. *European Journal of Public Health*, **28**. DOI: 10.1093/eurpub/cky213.137.

Brawner, C. A., Churilla, J. R. and Keteyian, S. J. (2016) Prevalence of physical activity is lower among individuals with chronic disease. *Medicine & Science in Sports & Exercise*, **48**, 1062–1067.

Buckley, B., Thijssen, D. H., Murphy, R. C., Graves, L. E., Cochrane, M., Gillison, F. *et al.* (2020a) Pragmatic evaluation of a coproduced physical activity referral scheme: a UK quasi-experimental study. *BMJ Open*, **10**, e034580.

Buckley, B., Thijssen, J. R., Murphy, D. H. J., Graves, R. C., Whyte, L. E. F., Gillison, G. *et al.* (2019) Preliminary effects and acceptability of a co-produced physical activity referral intervention. *Health Education Journal*, **78**, 869–884.

Buckley, B. J. R., Finnie, S. J., Murphy, R. C. and Watson, P. M. (2020b) "You've got to pick your battles": a mixed-methods investigation of physical activity counselling and referral within general practice. *International Journal of Environmental Research and Public Health*, **17**, 7428.

Buckley, B. J. R., Thijssen, D. H. J., Murphy, R. C., Graves, L. E. F., Whyte, G., Gillison, F. B. *et al.* (2018) Making a move in exercise referral: co-development of a physical activity referral scheme. *Journal of Public Health (Oxford, England)*, **40**, e586–e593.

Bundestag, D. (2015) *Gesetz Zur Stärkung Der Gesundheitsförderung Und Der Prävention (Präventionsgesetz - PrävG)*. Bundesanzeiger Verlag, Bonn, Germany.

Campbell, F., Holmes, M., Everson-Hock, E., Davis, S., Buckley Woods, H., Anokye, N. *et al.* (2015) A systematic review and economic evaluation of exercise referral schemes in primary care: a short report. *Health Technology Assessment (Winchester, England)*, **19**, 1–110.

Din, N. U., Moore, G. F., Murphy, S., Wilkinson, C. and Williams, N. H. (2015) Health professionals' perspectives on exercise referral and physical activity promotion in

primary care: findings from a process evaluation of the National Exercise Referral Scheme in Wales. *Health Education Journal*, **74**, 743–757.

Dugdill, L., Graham, R. C. and McNair, F. (2005) Exercise referral: the public health panacea for physical activity promotion? A critical perspective of exercise referral schemes; their development and evaluation. *Ergonomics*, **48**, 1390–1410.

Eakin, E. G., Smith, B. J. and Bauman, A. E. (2005) Evaluating the population health impact of physical activity interventions in primary care—are we asking the right questions? *Journal of Physical Activity and Health*, **2**, 197–215.

Estabrooks, P. A. and Gyurcsik, N. C. (2003) Evaluating the impact of behavioral interventions that target physical activity: issues of generalizability and public health. *Psychology of Sport and Exercise*, **4**, 41–55.

Foucault, M. (1995) Discipline and punish: the birth of the prison, *Second Vintage Books Edition*. Vintage Books, New York, NY.

Geidl, W., Abu-Omar, K., Weege, M., Messing, S. and Pfeifer, K. (2020) German recommendations for physical activity and physical activity promotion in adults with noncommunicable diseases. *The International Journal of Behavioral Nutrition and Physical Activity*, **17**, 12.

GKV-Spitzenverband (2020) Grafik: Entwicklung der Krankenkassenanzahl *seit 1970*. https://www.gkv-spitzenverband.de/gkv_spitzenverband/presse/zahlen_und_grafiken/zahlen_und_grafiken.jsp (last accessed 2 October 2020).

Gohres, H. and Kolip, P. (2017) Strukturen der Bewegungsförderung in Deutschland. *Prävention Und Gesundheitsförderung*, **12**, 203–210.

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P. and Kyriakidou, O. (2004) Diffusion of innovations in service organizations: systematic review and recommendations. *The Milbank Quarterly*, **82**, 581–629.

Hoffmann, T. C., Glasziou, P. P., Boutron, I., Milne, R., Perera, R., Moher, D. *et al.* (2014) Better reporting of interventions: template for intervention description and replication (TIDieR) checklist and guide. *BMJ (Clinical Research ed.)*, **348**, g1687.

Lassey, M. L., Lassey, W. R. and Jinks, M. J. (1997) *Health Care Systems around the World: Characteristics, Issues, Reforms*. Prentice Hall, Upper Saddle River, NJ.

May, C., Finch, T., Mair, F., Ballini, L., Dowrick, C., Eccles, M. *et al.* (2007) Understanding the implementation of complex interventions in health care: the normalization process model. *BMC Health Services Research*, **7**, 148.

Murphy, S. M., Edwards, R. T., Williams, N., Raisanen, L., Moore, G., Linck, P. *et al.* (2012) An evaluation of the effectiveness and cost effectiveness of the National Exercise Referral Scheme in Wales, UK: a randomised controlled trial of a public health policy initiative. *Journal of Epidemiology and Community Health*, **66**, 745–753.

Oliver, K., Kothari, A. and Mays, N. (2019) The dark side of coproduction: do the costs outweigh the benefits for health research? *Health Research Policy and Systems*, **17**, 33.

Onerup, A., Arvidsson, D., Blomqvist, Å., Daxberg, E.-L., Jivegård, L., Jonsdottir, I. H. *et al.* (2019) Physical activity on prescription in accordance with the Swedish model increases physical activity: a systematic review. *British Journal of Sports Medicine*, **53**, 383–388.

Pavey, T., Taylor, A., Hillsdon, M., Fox, K., Campbell, J., Foster, C. *et al.* (2012) Levels and predictors of exercise referral scheme uptake and adherence: a systematic review. *Journal of Epidemiology and Community Health*, **66**, 737–744.

Pedersen, B. K. and Saltin, B. (2015) Exercise as medicine – evidence for prescribing exercise as therapy in 26 different chronic diseases. *Scandinavian Journal of Medicine & Science in Sports*. **Suppl 3**, 1–72.

Rütten, A. and Gelius, P. (2014) Building policy capacities: an interactive approach for linking knowledge to action in health promotion. *Health Promotion International*, **29**, 569–582.

Rütten, A., Abu-Omar, K., Messing, S., Weege, M., Pfeifer, K., Geidl, W. *et al.* (2018) How can the impact of national recommendations for physical activity be increased? Experiences from Germany. *Health Research Policy and Systems*, **16**, 121.

Scearce, D. and Fulton, K. (2004) *What If? The Art of Scenario Thinking for Nonprofits*. Global Business Network, San Francisco, CA.

Schulz, K. F., Altman, D. G. and Moher, D., for the CONSORT Group. (2010) CONSORT 2010 statement: updated guidelines for reporting parallel group randomised trials. *BMJ*, **340**, c332.

Simon, H. (1979) Rational decision making in business organizations. *The American Economic Review*, **69**, 493–513.

Sørensen, J. B., Kragstrup, J., Kjaer, K. and Puggaard, L. (2007) Exercise on prescription: trial protocol and evaluation of outcomes. *BMC Health Services Research*, **7**, 36.

Weber, M. and Kalberg, S. (2013) *The Protestant Ethic and the Spirit of Capitalism*. New York, Routledge.

Williams, O., Sarre, S., Papoulias, S. C., Knowles, S., Robert, G., Beresford, P. *et al.* (2020) Lost in the shadows: reflections on the dark side of co-production. *Health Research Policy and Systems*, **18**, 43.

World Health Organization (2018) *Global Action Plan on Physical Activity 2018–2030: More Active People for a Healtier World*. World Health Organization, Geneva, Switzerland.