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Citation: Van der Graaf, Peter, Kislov, Roman, Smith, Helen, Langley, Joe, Hamer, Natalie, Cheetham, Mandy, Wolstenholme, Daniel, Cooke, Jo and Mawson, Sue (2023) Leading co-production in five UK collaborative research partnerships (2008-2018): responses to four tensions from senior leaders using auto-ethnography. *Implementation Science Communications*, 4 (1). p. 12. ISSN 2662-2211

Published by: Springer

URL: <https://doi.org/10.1186/s43058-022-00385-0> <<https://doi.org/10.1186/s43058-022-00385-0>>

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1 **Leading co-production in five UK collaborative research partnerships (2008-2018):**
2 **responses to four tensions from senior leaders using auto-ethnography**

3
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10

11 **Abstract**

12 **Background**

13 Despite growing enthusiasm for co-production in healthcare services and research, research on co-
14 production practices is lacking. Multiple frameworks, guidelines and principles are available but little
15 empirical research is conducted on 'how to do' co-production of research to improve healthcare
16 services. This paper brings together insights from UK-based collaborative research partnerships on
17 leading co-production. Its aim is to inform practical guidance for new partnerships planning to
18 facilitate the co-production of applied health research in the future.

19 **Methods**

20 Using an auto-ethnographic approach, experiential evidence was elicited through collective sense
21 making from recorded conversations between the research team and senior leaders of five UK-based
22 collaborative research partnerships. This approach applies a cultural analysis and interpretation of
23 the leaders' behaviours, thoughts, and experiences of co-production taking place in 2008-2018 and
24 involving academics, health practitioners, policy makers, and representatives of third sector
25 organisations.

26 **Results**

27 The findings highlight a variety of practices across CLAHRCs, whereby the intersection between the
28 senior leaders' vision and local organisational context in which co-production occurs largely
29 determines the nature of co-production process and outcomes. We identified four tensions in doing
30 co-production: 1) idealistic, tokenistic vs realistic narratives, 2) power differences and (lack of)
31 reciprocity, 3) excluding vs including language and communication, 4) individual motivation vs
32 structural issues.

33 **Conclusions**

34 The tensions were productive in helping collaborative research partnerships to tailor co-production
35 practices to their local needs and opportunities. Resulting variation in co-production practices across
36 partnerships can therefore be seen as highly advantageous creative adaptation, which makes us
37 question the utility of seeking a unified 'gold standard' of co-production. Strategic leadership is an
38 important starting point for finding context-tailored solutions; however, development of more
39 distributed forms of leadership over time is needed to facilitate co-production practices between
40 partners. Facilitating structures for co-production can enable power sharing and boost capacity and
41 capability building, resulting in more inclusive language and communication and, ultimately, more
42 credible practices of co-production in research. We provide recommendations for creating more
43 realistic narratives around co-production and facilitating power sharing between partners.

44 **Key words:** co-production, NIHR CLAHRCs, applied health research, auto-ethnography

45 **Contributions to the literature' section:**

- 46 • Despite an abundance of frameworks and models, there is noticeable gap in the current
47 literature on 'how-to' do co-production in large partnership structures
- 48 • Our paper identifies four tensions in doing co-production of research which senior leaders
49 need to solve to create a realistic narrative for their partnerships
- 50 • The four tensions help collaborative research partnerships to tailor co-production practices
51 to their local needs and existing opportunities
- 52 • Variation in co-production practices should not be reduced to one gold standard but
53 celebrated
- 54 • More distributed forms of leadership are needed to facilitate power sharing between
55 partners

56

57

58 Background

59 Interest in and use of co-production in healthcare services and research is growing. Funders of
60 applied health research have embraced co-production as a means of improving patient, public and
61 professional involvement. (1-3). Academics have been equally enthusiastic in developing a range of
62 conceptual frameworks, guidelines and principles for co-production, underpinned by a rich and
63 growing literature on the topic, with insight from the social sciences and humanities (4), political
64 science (5), public management (6) and academic entrepreneurship (7) literature. Recent systematic
65 reviews of co-production have summarised the different co-production approaches in use and
66 collated the outcomes and effects of co-production (8).

67 These reviews show a plethora of terms in use; for example, within healthcare we see services,
68 programmes and interventions being 'co-created', 'co-designed', 'co-evaluated' or 'co-
69 implemented', and often authors used these terms in combination to describe their work ((8)). This
70 can involve stakeholder and public engagement through participation or involvement in any or all
71 steps of the applied research cycle ((9),(10)). All are regarded as processes of co-production but the
72 way they are enacted and operationalised varies depending on the purpose, what is being co-
73 produced, and by whom ((11), (12)). Some of the ambiguity in co-production also comes from its
74 unclear relationship with Patient and Public Involvement/and Engagement (PPI/E) (13). Other
75 structural approaches, such as Experience-Based Co-Design (EBCD) appear to be more often applied
76 to service development, while community engaged research dissemination ((14)) seems to have a
77 more limited focus on dissemination of research findings. In this paper, we are selecting
78 'coproduction' as the umbrella term, acknowledging that this concept is hard to define given the
79 plethora of definitions and approaches in circulation, and by having both instrumental and moral
80 value (15).

81 Despite the proliferation of conceptual thought, empirical studies on co-production are less frequent
82 (16). Many of co-production models and frameworks are not supported by robust evidence (17) and
83 do not describe in practical terms what co-production of research on the ground looks like (18). It is
84 therefore timely to reflect on what has been learnt about the practice of co-production in applied
85 health research and to help shape the direction of future research.

86 In the UK context, some argue that the architecture of the new NIHR Applied Research Collaboration
87 funding model enables authentic and visible co-production (19). Others are more cautious, arguing
88 that co-production can only be as successful as the system allows, and that traditional research
89 structures often fail to facilitate effective public involvement, leading to co-opting of the term co-
90 production without making a tangible difference to professional practices and health outcomes for
91 service users (15, 20). There are anecdotal accounts of successful collaborative working from the
92 previous NIHR funding model, Collaborations for Leadership in Applied Health Research (CLAHRCs),
93 who were evidence-based following the Knowledge to Action model (21)) to ensure that all resulting
94 interventions or findings were underpinned by robust research evidence. These accounts suggest
95 that co-production projects added value and led to the implementation of novel services and
96 interventions (22, 23). This model also introduced a focus on leadership and governance for co-
97 production that we will explore in more detail in our paper. So-called 'success' stories like these are
98 not always published or reported on or described in a way that explicates how best to support
99 researchers to co-produce applied health research or complex health interventions (24).

100 Therefore, this paper brings together insights from those in leadership positions in collaborative
101 research partnerships in the UK on practising co-production with the aim to inform practical
102 guidance for new partnerships facilitating the co-production of applied health research in the future.
103 The focus of this paper is on the co-production of healthcare services, which aims to collaboratively

104 produce and apply knowledge involving academic researchers as well as health practitioners and
105 policy makers in Local Government (LG) to inform service development and decision making, with
106 the active inclusion of all partners in the research design and process (25). This approach is indebted
107 to the work of Elinor Ostrom (26), who used the term co-production to describe a process through
108 which ‘inputs from individuals who are not “in” the same organisation are transformed into goods
109 and services’. This approach blurs the boundaries between 'knowledge production' and 'knowledge
110 application: the former often focuses on researchers’ roles, while the latter is of most value to
111 health practitioners and policy makers (knowledge translation and problem-solving). Co-production
112 through collaborative research partnerships helps to bring the two approaches together.

113

114 **Methods**

115 Using an auto-ethnographic approach (27), experiential evidence was elicited through collective
116 sense making from conversations between the research team and senior leaders of five collaborative
117 research partnerships, including four former CLAHRCs (Yorkshire & Humber, Greater Manchester,
118 East Midlands and South London) and one former UK Clinical Research Centres (UKCRC) research
119 centre of excellence (Fuse, the Centre for Translational Research in Public Health). These
120 collaborative partnerships were selected from a convenience sample through our shared
121 participation in a special interest group on co-production.

122 ***Five collaborative research partnerships***

123 NIHR CLAHRCs were created in 2008. The NIHR initially funded nine CLAHRCs across England with a
124 specific aim: to develop and conduct applied health and care research across the NHS, and to
125 translate research findings into improved outcomes for patients (24). Each individual CLAHRC did
126 this by creating linkages and partnerships between the applied health and care researchers who
127 conduct the research, and those who use the research in practice, developing different practices of
128 co-production. In 2013, following the success of the pilot CLAHRCs, NIHR funded a second round of
129 13 CLAHRCs for a five-year period starting in January 2014. CLAHRCs were each structured into
130 thematic programmes (themes) bringing together researchers, practitioners and patients with
131 shared interests through regular meetings and events.

132 Fuse was established in 2008 as one of five public health research centres of excellence in the UK
133 funded by the UKCRC collaboration. Fuse works across five universities in the North East of England
134 with a prime focus on the production of excellent research, and its translation into usable evidence
135 to inform practice. The Centre applies a 5-step model to knowledge exchange that encourages co-
136 production of research between partners, including a rapid responsive research and evaluation
137 service (28).

138

139 ***Data collection***

140 Data on the five collaborative research partnerships is drawn from recorded online interviews
141 between the research team and senior leaders of these partnerships between April and July 2021.
142 Theme leads within each former CLAHRC and Fuse with responsibility for co-production of research
143 activities within their region, were identified through personal networks of the research team and
144 invited by email for an online interview. Five theme leads agreed to a recorded semi-structured
145 interview, followed by informal email conversations, and gave consent for the interviews to be
146 recorded. In the interviews, we aimed to document the learning from a selection of CLAHRCs and
147 similar partnerships, and to draw up narrative accounts around their experiences, as we wanted to

148 understand the overall leadership narrative around co-production. Interviews followed a story line
149 topic list (Appendix 1). Participants were not provided with a definition of co-production upfront but
150 were asked in the interviews to reflect on approaches to co-production adopted within their
151 partnerships. Inductive data analysis was used to determine how different partnerships thought of
152 co-production and to compare different descriptions and practices.

153

154 ***Data analysis***

155 Recorded online conversations were transcribed and analysed using an auto-ethnographic approach
156 (27). Auto-ethnography is a research method that uses a researcher's personal experience to
157 describe and critique cultural beliefs, practices, and experiences. It acknowledges and values a
158 researcher's relationships with others and shows 'people in the process of figuring out what to do,
159 how to live, and the meaning of their struggles'" (29). Auto-ethnography is a self-reflective form of
160 writing that has been used across various disciplines such as communication studies, sociology,
161 psychology, organizational behaviour, nursing, and paramedicine. In this study, we used 5his
162 approach to apply a cultural analysis and interpretation of the leads' behaviours, thoughts, and
163 experiences of co-production between 2008 and 2018 in relation to the academics, health
164 practitioners, policy makers, and local communities/ third sector organisations involved in co-
165 produced research projects within the collective research partnerships.

166 This method was chosen in recognition of the sensitive nature of the dialogues that take place
167 between programme leads and the research team and the importance of these dialogues for
168 collective sense making of co-production practices. The auto-ethnographic approach allowed for a
169 safe deconstruction of these conversations that was sensitive to the research team's own input to
170 these conversations.

171 The transcribed data were analysed in three steps: starting with individual recall and reflection by
172 each author, followed by joint analysis with the research team of the transcribed conversations, and
173 finally, collective sense making with the interviewed CLAHRC programme leads in an online
174 workshop. Walking the talk, most of our participants became co-researchers and co-authors of this
175 paper.

176 Firstly, members of the research team read through all the transcripts from the recorded
177 conversations and noted down their thoughts and reflections on co-production practices within each
178 CLAHRC and Fuse, and barriers and facilitators in using these practices. Research team members did
179 this first separately and, secondly, compared notes and reflected collectively in a joint interpretation
180 meeting on 18th February 2021. This resulted in the identification of six tensions that were apparent
181 when applied health research was co-produced within the CLAHRCs (see Results section). Thirdly,
182 the collective reflections and analysis from the research team were shared with the interviewed
183 CLAHRC theme leads in an online workshop on 12th October 2021 to facilitate collective sensemaking.

184 In preparation for the workshop, senior leaders were tasked with completing a resource pack
185 (Appendix 2) that summarised the six tensions identified by the research team in their joint analysis
186 meeting. They were asked to comment and make suggestions for each tension and subsequently
187 rearrange the tension cards according to how important and/or relevant they are to the present
188 Applied Research Collaborations (ARCs) using an inner (most important and/ or relevant) and outer
189 circle (least important and/ or relevant).

190 This three-step approach to the analysis of the conversation data facilitated the recalling and
191 organisation of the research team's memories of the conversations and supported self-introspection

192 to analyse these memories. To select memories, senior leaders were asked during the workshop to
193 reflect and add to each tension through a group discussion, in which we were also checking for
194 shared meaning of the tensions. At the beginning of the workshop, senior leaders were asked to
195 nominate their most important/ relevant tensions in a poll, which formed the basis for the
196 discussion. Based on this discussion, an additional tension was identified (motivation vs lack of skills)
197 and added to the previously identified tensions, while three other tensions (4. research vs non-
198 research activities; 5. traditional academic ways of working and publishing vs new way of generating
199 and disseminating evidence; 6. strategic leadership vs capacity on the ground) were merged into one
200 new tension to represent the overarching tension of individual motivations versus structural issues,
201 bringing the final number of tensions to four.

202

203 **Results**

204 The findings highlight a variety of practices across and between CLAHRCs, with the context in which
205 co-production occurs, and the values, expectations, and motivations that collaborative partners
206 applied within their different contexts, determining the nature of the co-production processes and
207 outcomes. The CLAHRCs were based on a model of co-production, that was evidence based (21).
208 However, each CLAHRC was developed in a different context responding to unique local needs,
209 resulting in diverse co-production practices. We highlight these different practices through the lens
210 of four tensions that represent the main challenges that the five collaborative research partnerships
211 had to solve differently to develop their co-production practices. We present these tensions as a
212 spectrum along which senior leaders can move when thinking through their approach to co-
213 production. We identified the following four tensions in doing co-production and below we will
214 discuss each tension in more detail:

- 215 1) Idealistic, tokenistic vs realistic narratives
- 216 2) Power differences and (lack of) reciprocity
- 217 3) Excluding vs including language and communication
- 218 4) Individual motivation vs structural issues

219

220 **1 Idealistic, tokenistic vs realistic narratives**

221 Senior leaders reflected on how some co-produced applied research can be tokenistic with passive
222 collaboration (only pulling in knowledge when you need it) and less emphasis on empowerment,
223 equality and inclusion; yet at the same time argued that 'gold standard' co-production may not be
224 achievable (and may put people off trying).

225 From their experience, senior leaders highlighted that there is no one size fits all when it comes to
226 co-production. Different projects require different methods and therefore the definition of co-
227 production needs to be fluid to allow for this.

228 *"One of the things we've got to is that co-production isn't one thing and shouldn't*
229 *be one thing. It's a bit like the elephant. It looks different, depending on which*
230 *direction you approach it from."*

231 Setting a "gold-standard" method/definition for co-production was felt to discourage researchers
232 from trying to work in co-production and, therefore, a balance is needed between aspirations for co-
233 production of research and what is realistically achievable, given different contexts and limited

234 resources. Getting this balance wrong e.g., not making choices about what is feasible and being
235 unclear about the realities of what is achievable, risks tokenism.

236 Tokenism came up several times in the conversations and was linked by senior leaders to both a lack
237 of consistent terminology in the use of co-production and a lack of funding for co-produced
238 research, which we discuss as two sub-themes with this tension below.

239

240 Lack of clarity on the meaning of co-production

241 Senior leaders reflected on a lack of general consensus about what is and what is not considered to
242 be effective co-production and how this can lead to confusion and ambiguity. In practices across the
243 CLAHRCs, the terminology around co-production varied considerably. Terms used included: co-
244 design, translational research, co-production, co-creation, knowledge mobilisation, and Patient and
245 Public Involvement (PPI). Although, the senior leaders felt there was some overlap in the meanings
246 implied by these terms, many considered them different forms of involvement and their loose
247 definitions lead to confusion. (For a more detailed discussion of these different terms, see our
248 scoping paper; ref).

249 In addition, senior leaders suggested that many health professionals are doing co-production
250 research under a different name or by using differently terminology. This makes it difficult to
251 recognise how many projects are actually working in this way.

252 *“I went back to thinking like a nurse and thinking about the knowledge-practice*
253 *gap. And that's what translation is and then I was looking at integrated knowledge*
254 *translation and co-production, I thought, well, this is what we've been doing, but*
255 *we were calling it shared decision-making and you're calling it translated*
256 *knowledge into action.”*

257 According to collaborative research partnership leaders, this lack of defined terminology can open
258 the door for tokenistic involvement: *“Tokenism takes advantage of the elasticity of definition or*
259 *specificity of co-production.”*

260 PPI was particularly highlighted by the senior leaders in terms of its similarity or difference to co-
261 production. They felt that PPI was already well defined (30), but it is not necessarily clear how it
262 differs from co-production, with some people seeing these terms as two ways of describing the
263 same thing: involving external stakeholders in research, either as patients, public members or
264 practitioners and policy makers.

265 Other senior leaders argued that PPI equated to more passive involvement, with co-production
266 encouraging more active involvement of outside groups through power sharing. Moreover, co-
267 production does not always involve patients or the public: stakeholders from outside academia can
268 come from a variety of fields and (professional) backgrounds.

269 Senior leaders also distinguished co-production from dissemination of research. Co-production
270 began early and was seen as more than the re-packaging of research findings at the end of the line
271 to be gifted to external stakeholders.

272 *“I think increasingly I'm realizing that levels of understanding about what we mean*
273 *by co-production are so massively varied... there are people in senior positions in*
274 *the academic hierarchy who still understand co-production as being about the*
275 *dissemination of research findings. Once you've done it, basically you've bundled it*
276 *up in a neat package and you've written some briefing or some such. And that view*

277 *persists. And that's a really hard one to shift, [...] unless NIHR starts taking it more*
278 *seriously and understanding that it happens right the way through the research*
279 *process from start to finish and beyond, I think it's really, difficult."*

280

281 Lack of funding for co-produced research

282 Tokenism in practicing co-production was further fuelled in the eyes of senior leaders by a lack of
283 funding for meaningful co-produced research. They commented on the increasing requirement of
284 funders to work in co-production with insufficient resources being made available by funders to
285 commit the time and effort needed to drive good co-production practices. There was a feeling
286 among the senior leaders that a technocratic view of co-production (breaking it down into distinct
287 and manageable parts with separate resources) leads to tokenism, which de-values co-production as
288 a concept. They argued that stakeholders involved in a tokenistic way would be less likely to engage
289 with co-production of research in the future, as they felt unheard or under-valued when sharing
290 their experiences.

291 *".. tokenism talks directly to the fact that if you don't have money to do it*
292 *properly, you don't do it".*

293 Other senior leaders commented that some funders don't fully understand the activities and
294 engagement that co-production actually requires, and at what stage.

295 *"But then also I don't think that the way that NIHR function and the kind of things*
296 *they ask for in bids for funding really...they don't really understand the nature of*
297 *the engagement that is necessary."*

298 *"People do it as cheaply as possible and as quickly as possible and that will you*
299 *get what you pay for. So, I think there really needs to be a recognition, if they*
300 *want really good co-production and patient public involvement...That has to be*
301 *funded."*

302 The way research is delivered in terms of funding applications and ethical approval for projects
303 means it's hard to engage stakeholders in the earlier design phases of research. This then makes it
304 harder for stakeholders or members of the public to influence the direction of the research when a
305 plan is already approved and in place.

306 According to senior leaders, an important condition for co-producing research is creating meaningful
307 relationships with stakeholders to allow trusting and equal partnerships. Creating these contacts
308 and relationships however is not considered in project funding or planning.

309 *"You can't build relationships with people if nobody's paying your salary at the*
310 *point where you need to be doing it, for example."*

311 Although many funding bodies and research teams say they support co-production, as soon as
312 funding becomes tight, it was felt that protected time for co-production is one of the first things to
313 suffer.

314 The senior leaders explained how the CLAHRCs were able to make a difference to the funding
315 available for co-production of research by including co-production as a core principle in their
316 business model with dedicated funding.

317 *“In the Autumn of 2008 we held a co-design workshop with all our South Yorkshire*
318 *stakeholders and academics, the purpose of which was to establish core principles and ways*
319 *of working. At this point, we developed and approved our core principles, one of which was*
320 *co-production. We developed mechanisms to achieve and enable co-production and then*
321 *implemented this core principle across the lifetime of the South Yorkshire CLAHRC.”*

322 An example of funding mechanism in the South Yorkshire CLAHRC was the Getting Research Into
323 Practice (GRiP; see case study in Supplementary Files) programme:

324 *“The GRIP programme was a series of co-design projects the purpose of which was to get*
325 *research into practise. This has gained national recognition in the field of co design and co-*
326 *production.”*

327 Although the CLAHRCs, were able to tackle the funding issue around co-production to reduce
328 tokenism, the issue of lack of clarity about the meaning of co-production remained. Therefore,
329 senior leaders called for more transparency about what researchers mean by co-production and the
330 extent to which stakeholders outside academia were included throughout the research process.

331

332 **2) Power differences and (lack of) reciprocity**

333 Academics often see themselves as ‘experts’ and need to recognise ‘experts by experience’ as
334 equally powerful; everyone involved should gain from co-productive evidence generation. Senior
335 leaders identified the need to challenge traditional academic research approaches and to be flexible
336 and creative in co-production, which will be explored below as two sub-themes within this tension.

337 They mentioned repeatedly the tension of power sharing, subscribing to the ideal of equal power
338 relations as a prerequisite for co-production. Power sharing is essential for building good
339 relationships and recognises the value that practitioners, policy makers and members of the public
340 can bring in terms of knowledge, skills, and experience in co-producing research. However, achieving
341 power sharing proved difficult in practice.

342 The senior leaders described different examples of groups outside academia who participated in
343 their CLAHRCs. These included both individuals, small groups, and larger organisations. Examples
344 included healthcare professionals, policy makers, patients, funders, commissioners, local community
345 groups, technical experts, public committee members, services users, and private sector groups.
346 Many of the researchers talked about the ways in which these stakeholders had participated in
347 different research projects, such as facilitated workshops, knowledge exchange events, peer
348 researchers (e.g. stakeholders as interviewers), and stakeholders working in an advisory group to
349 help steer the direction of research.

350 One example discussed involved the use of Lego serious play to deliver a shared model of co-
351 production.

352 *“What was particularly novel in the Yorkshire and Humber CLAHRC was the development of a*
353 *concept known as creative practise, led by Dan Wolstenholme and Joe Langley. It was a*
354 *programme of work that used co design to co-produce knowledge mobilisation tools”.*

355 Another team recommended setting ground rules at the start of the session to ensure everyone was
356 on the same page and felt comfortable to share their ideas and experiences.

357

358 Challenging traditional research approaches

359 Much of the conversations between the senior leaders and the research team focused on the
360 challenges of doing co-production in the landscape of clinical academic research. Co-production
361 challenges traditional (e.g., positivist) research approaches and requires a change in how researchers
362 view their roles as academics.

363 *“But that means giving up a bit of power and you know we're good at beaming in*
364 *as the expert because that makes us feel good. We're not very good at beaming in,*
365 *and it takes a brave person to say, I haven't got all the answers, tell me what you*
366 *think might work. And it completely flies in the face of everything that people think*
367 *that their role or they've been taught their role as an academic is all about.”*

368 For co-production to be successful and produce outputs which are valuable to the involved
369 stakeholders, senior leaders argued that academics need to be willing to compromise on things such
370 as research direction and project design. They acknowledged that this change in academics' usual
371 way of working would be new ground for many researchers and can be both unfamiliar and
372 uncomfortable, to the point that some academics would feel that their academic integrity was being
373 compromised.

374 *“What I wanted was open mindedness and flexibility, to come to a sort of mutually*
375 *agreed project spec and scope on the basis that it would be more likely to be*
376 *achieved. But of course, the mutual agreement often meant, as we've looked at it -*
377 *the kind of compromise and those kinds of issues: academics felt their integrity was*
378 *being compromised.”*

379 One of the key requirements for working in an equal, power-balanced way with external
380 stakeholders highlighted by the senior leaders was the ability for academics to be flexible in the
381 research process and choice of methods. Over time, the priorities and direction of stakeholder (and
382 academic) organisations may change. This can be challenging to address when projects have already
383 been outlined and funded, but flexibility to adapt to the needs of stakeholders was deemed crucial.
384 This flexibility was not seen as available in the current research and funding system.

385 *“There's this whole sort of set pathway where you plan ahead for the next five*
386 *years, what you will be doing that doesn't leave any space to have these early*
387 *conversations where you say, well, actually scrap that what we really should be*
388 *doing is this. What is it that you think we should be doing? You know, what do you*
389 *think is important?”*

390 The senior leaders did not refer to a flip of power, whereby researchers would completely defer to
391 their practice partners, but suggested instead more of an active negotiating process in which health
392 professionals and policy makers have equal power to make decisions about the research. This
393 requires an additional set of skills from those typically associated with academic researchers,
394 including humility.

395

396 Co-production as a creative endeavour

397 Co-production was described as 'a creative endeavour' which doesn't sit very well within rigid pre-
398 determined research structures and processes:

399 *“There is something quite rigid in the way that some forms of research, people are trained*
400 *and taught. I mean the idea that even after participant number two you know something is*

401 *not going to work. But because you've got a sample of however many participants in your*
402 *trial, you have to pursue it right to the bitter end. That kind of inflexibility is...I might be*
403 *exaggerating, but that kind of inflexibility is something which is a whole paradigm of*
404 *research. And it's deeply engrained, it's cultural. And co-production is creative, emergent,*
405 *responsive, all of those opposite things”.*

406 While more rapid research designs or rules for stopping in traditional clinical trials reduce some of
407 rigidity in research, the perception of the senior leaders was that more flexibility is required in co-
408 producing research.

409 One researcher in the North East discussed an example where they were embedded in a community
410 and asked to develop responses to tackle childhood obesity. Early conversations with community
411 members indicated that they were more concerned with poverty, inequality and the early roll out of
412 Universal Credit, leading to a follow up study being commissioned on the impact of Universal Credit:

413 *“And, you know, the Universal Credit study is a brilliant example. And it started out*
414 *with you know, a project which was supposed to be about childhood obesity,*
415 *because that was an issue. But then the local community said, no, we're less*
416 *concerned about childhood obesity and more concerned about Universal Credit*
417 *actually, because that affects our very survival.”*

418 This example, points to another potentially important trait for co-production research: starting small
419 can develop trusting relations for larger projects, with organic development of research projects
420 being much more conducive to co-production processes involving wider groups of stakeholders.

421 *“there was quite an impact from, and I, sometimes I forget about the you know, that, again,*
422 *it started from a small scale, small-funded project, and then ended up with (researcher)*
423 *talking to it, to the select committee and, you know, and, and that then resulted in some*
424 *supermarkets restricting sales to energy drinks to under eighteens or under sixteens in some*
425 *cases.”*

426 Working flexibly with stakeholders during the research process also requires from academics an
427 understanding and appreciation about what stakeholders expect or want from the co-production
428 process. Stakeholder involvement was viewed as a two-way street. Senior leaders emphasised that,
429 although we may have an ideal as academics of how we want from stakeholders’ input, we need to
430 be able to adjust for how much or little they want to get involved. Whether that’s down to the time
431 and resources they can feasibly spare or how much they are wanting to engage and participate, we
432 need to work flexibly and have early conversations about expectations around involvements and
433 outputs. For instance, for many stakeholders, getting papers published was not a reason to get
434 engaged with research: *“Publications are not sufficient for many participants. The difference work*
435 *makes has to be real to them.”* These power difference also extended to tensions between academic
436 researchers within the CLAHRCs (see case study 2 in the Supplementary Files).

437

438 **3 Excluding vs including language and communication**

439 The use of ‘research’ jargon and the communication style of researchers can exclude partners
440 involved in co-production such as service users, managers, or practitioners. Senior leaders
441 highlighted the importance of language and communication in co-production and the need for more
442 training in co-production craft (the skills in the practices and activities of co-production) to, which
443 will be discussed below as two sub-themes within this tension.

444

445 Language and communication

446 The senior leaders emphasised that language and communication skills were very important in co-
447 produced work, both to help build relationships and to make data and research ideas accessible to
448 all involved stakeholders.

449 *“Different people learn, communicate and express themselves in different ways.
450 Using only forms that are common to researchers, excludes some.”*

451 They urged academics to try a variety of different engagement techniques and communication styles
452 to get the best out of co-production with different stakeholder groups. However, these types of skills
453 aren't necessarily held by all academics.

454 *“You do have to use lots of different methods in order to get the most bang for
455 your buck out of your research. And actually taking some of that time up front to
456 use better methods to engage means you get better engagement.”*

457 Another skill suggested by the senior leaders for co-production of research was the ability to find
458 and engage with the right people within stakeholder organisations. How to identify key people and
459 how to connect with them in a meaningful way was perceived by them as an ongoing challenge,
460 particularly in larger organisations, such as local government or NHS Trusts.

461 *“The partners that we had most difficulty engaging tended to be the larger acute
462 organisations because you can't engage with a whole organisation and it's finding
463 out who the key people are... So, some of the problem was identifying the right
464 people to talk to and you could be passed from pillar to post.”*

465 Senior leaders suggested that academics do not always need to have the necessary design skills
466 themselves but can broker links with other colleagues within their institution or networks or in other
467 departments within their university, such as design students. These colleagues and students can add
468 creativity and bring a fresh perspective to the research.

469 *“So, I think one of the big things that we pushed a lot was look to other parts of
470 your university, look to the design departments, for people who can come up with
471 ideas or visualize things that your team can't.”*

472 Working in co-production was perceived by the senior leaders as a unique craft requiring different
473 skills that need constant attention through the research process. They defined this craft as skills in
474 the practices and activities of co-production, that were developed through experience (to develop
475 the art), combined with knowledge (based on the science) of coproduction. They advised building in
476 regular moments for reflection and reporting in team meetings on how the research team is
477 practicing and achieving co-production. The floor should be open for teams to consider how they are
478 involving their stakeholders and whether anything else can be done to facilitate further meaningful
479 engagement/involvement.

480 *“Co-production doesn't just happen. It's not just, it's not just bringing people
481 together in a room. It was a very, very conscious attention to a whole range of
482 factors that allows good co-production to happen.”*

483 To support this reflective process, one leader suggested that teams appoint co-production
484 champions at all levels of their organisation to promote collective reflection and building capacity
485 and capability in co-production.

486 *“Even if you don't have a dedicated theme, you need dedicated champions and*
487 *those champions need to be scattered throughout the organization, different*
488 *positions at different levels.”*

489 Another way suggested by senior leaders to build this capacity and capability in the research system
490 was by incorporating co-production training into undergraduate, Masters and PhD programmes. Co-
491 production is currently not built into the curriculum of academia. Instead, they advocated for more
492 teaching early in academic careers about different ways of doing research and valuing different ways
493 of knowing. It was felt that good policy influencers, require changes to the academic models that
494 produce them. The biggest barriers to co-production were thought to be structural and often located
495 in academic institutions (see tension 4 below). As long as we don't train students in engaging with
496 policy and practice partners, fail to teach and reward them in how to use different types of evidence
497 and do not involve them in collaborative research, we will keep returning to the conclusion that very
498 little research evidence is getting used in practice and policy.

499

500 Motivation versus skills

501 The lack of training in co-production is central to the four tensions that senior leaders identified: the
502 tension between an individual's desire and motivation to work in co-production with external
503 stakeholders on research (which varied within CLAHRCs) and their capability and capacity to do this
504 and deliver it in projects.

505 *“Looking back through our CLAHRC is that I think there were some tensions between*
506 *motivation to do it, but not having the skills or abilities to deliver. So, some of it was actually*
507 *more within individuals or projects.”*

508 They outlined co-production skills as a separate skill set that can't be taught in a two-day training
509 course but needed to be acquired through practice. For example, being flexible, persuasive, planned
510 happenstance, enthusiasm, serendipity, perseverance, patience, negotiation, pragmatism, learning-
511 oriented, empathy, confidence (31). Practicing co-production was seen as understanding different
512 ways of knowing (cognitive flexibility). While it is important to give people a go at working in co-
513 production, senior leaders felt it was important for them to consider the skills that are needed to
514 work in this way and who they could bring in as part of their research projects to facilitate those
515 skills (e.g., mentorship). Researchers don't need to be experts themselves but could learn on the job
516 from these experts:

517 *“You need to appoint someone to facilitate and lead co-production who is skilled and expert*
518 *at doing it. And, therefore, there needs to be a process where you enable people to enquire*
519 *and accumulate those skills perhaps under the supervision and mentoring of people and*
520 *participating alongside people who are more skilled at doing it. Because that way it shows*
521 *respect and value to the whole process of co-production itself”.*

522 Involving co-production expertise from the start in research projects, next to other roles such as
523 statisticians and qualitative researchers, was seen as an important mechanism to support and teach
524 other team members in developing their co-production skills, and to build co-production capacity
525 within research teams. The senior leaders suggested moving away from a perception of co-
526 production as a soft skill and defining it more as a craft that researchers need to hone and develop

527 over time. Using the right language and communication about co-production includes how these
528 skills are defined and labelled.

529

530 **4. Individual motivations versus structural issues**

531 Individual motivation for working in co-production

532 Despite a lack of clarity around the meanings of co-production, lack of co-production skills and a lack
533 of funding for meaningful co-production, senior leaders generally highlighted positive experiences of
534 working in co-production with stakeholders in the CLAHRCs, both from an instrumental and moral
535 imperative. Instrumentally, the senior leaders linked the impact agenda and negative perceptions of
536 the public about research as incentives for engaging in co-production of research. Applied health
537 care research can sometimes be seen as as the nanny state, finger wagging and patient-blaming, but
538 that image can be changed by academics working on issues that matter to the public and that hold
539 value for the stakeholders involved in co-production.

540 *“It can be very rewarding because in terms of the kind of impact agenda for some*
541 *academics they can see real benefit in the work that they’ve done being used,*
542 *enabling change in practice, etc.”*

543 Senior leaders highlighted from their experiences how co-production improved the quality and
544 utility of their work. Involving the end-users in the design and development process, participants felt
545 that they were more likely to come up with a product that was fit for purpose and better suited the
546 needs of their target audience.

547 *“Pragmatically if you work with the people who are going to use the stuff that you*
548 *were trying to make, be that research services, products, whatever, they were more*
549 *like to use them in the long term. Pragmatic logic that co-designing services and*
550 *products means people more likely to use them. So, you got better stuff. You got*
551 *better things out the other end.”*

552 This requires a critical look at the distinction between research users and producers. Academics are
553 not the only ones producing research and patients and the public are not always end users (32).
554 Within research partnerships, stakeholder involvement allowed for better knowledge to be created
555 and shared by making use of knowledge from lived experience.

556 Morally, the senior leaders felt that people should be included in research and projects that impact
557 them. They referred to similar imperatives in other disciplines, ranging from commercial groups
558 using consumer testing and feedback, to healthcare authorities emphasising a patient-centred,
559 shared decision-making approach to patient care to highlight stakeholder involvement as business-
560 as-usual in health and social care sectors. Therefore, including stakeholders in research was seen as
561 the right thing to do.

562 *“On one level, we absolutely believed that co-production, as in working together*
563 *with people and patients, was the right way to go about doing things.”*

564

565 Structural barriers

566 However, the ability and capability to work in co-production in the CLAHRCs was to an extent
567 dependant on wider structures and system incentives, which often hampered opportunities for
568 academics to engage in meaningful co-production with external stakeholders. Co-producing

569 evidence means researchers enabling people's involvement, partnership engagement and
570 facilitation; academic institutions tend not to recognise or reward these non-research activities.
571 Senior leaders complained about academic institutions not facilitating or valuing co-production
572 practices. The outputs of co-produced projects are not necessarily traditional high-impact papers,
573 and many senior academics see co-production as a lower rung in the research evidence hierarchy,
574 which is not conducive for academic promotion.

575 *"I think also the structures in which academia works, doesn't value, the outputs of*
576 *co-production because they aren't papers."*

577 *"What I find sad is that the people who genuinely had that much more partnership*
578 *engaged approach are not the ones who are seen as great academics and I think*
579 *that's a shame, but I think that's a problem with the academic system."*

580 Moreover, traditional academic, positivist ways of producing evidence value objectivity and
581 separation of researchers and participants, whereas working in a co-productive way involves
582 generating experiential knowledge, sharing of roles and more dynamic and equitable relationships
583 across the research cycle (see case study CLAHRC South Yorkshire: utilising different skills sets).

584 Some senior leaders within CLAHRC played a critical role in envisioning co-production within their
585 research structures, although the capacity to enact and use co-production in projects varied. In the
586 discussion of our first tension (on idealistic, tokenistic vs realistic narratives), we saw an example of
587 how leadership in a CLAHRC ensured that co-production principles were encouraged as a way of
588 working within the structure from the start. However, encouraging all members of the CLAHRC to
589 apply these principles proved an ongoing challenge.

590 *"When I then put together the Yorkshire and Humber (YH) application we carried these core*
591 *principles into the YH CLAHRC. However, this was a more difficult challenge, as the*
592 *geography was huge and the concept wasn't as well understood amongst some academics.*
593 *Over time, running workshops and marketing materials such as our brochures and 'Bite' we*
594 *did achieve co-production but perhaps not in all themes".*

595 Some senior members of academic institutions who make decisions about funding, impact case
596 studies and publication fees, do not value co-production as they have not been exposed to it in their
597 career or don't appreciate its role as a form of valid research.

598 *"In a way the system has rewarded people who've got to those very senior*
599 *decision-making positions, and a lot of them have got to where they are without*
600 *needing or wanting to work in a co-production way. And so, in a way, what's the*
601 *incentive for people to change and do more of that because you know that they've*
602 *got where they are, and they've done very nicely out of it."*

603 It was recognised that although junior members of organisations usually have more time and energy
604 to engage stakeholders and public contributors in research projects, they don't necessarily have the
605 power and influence in the organisation to make co-production a priority.

606 As Pearce (33) points out in several studies (15, 34, 35) much of the work of PPI and co-production is
607 carried out by those on the 'lower' end of the academic hierarchy, such as junior researchers who
608 are likely to have short-term contracts. The gendered and racialised aspects of co-production have
609 also been highlighted (15, 36), with women and ethnic minorities tending to carry out the labour of
610 research, whether as academic, peer researcher or patient and public member, but who in terms of
611 secure employment and research funding may hold little power.

612 Conversely, the people at the top of the organisation with the influence, often don't have the time
613 and resources to commit to these co-produced projects.

614 *"I would be worried, if people tell you they've got lots of time to engage with you*
615 *they're probably not the key people in the system because the key people in the*
616 *system are very overwhelmed."*

617 However, senior leaders were keen to stress that co-production is a human resource process that
618 needs people. Junior researchers need to be encouraged to go into co-production processes, just as
619 they have permission to develop their partnerships for research applications. The role of senior
620 leaders was seen as enabling this. Complexity of organisations and research infrastructures, such as
621 CLAHRCs, can make this a challenge with leaderships spread across different levels and therefore
622 potential blockages in junior researchers receiving permission for co-production.

623 *"There's the very strategic leadership of the CLAHRC and then there are leaders within the*
624 *themes as well. And both can be enabling, or they both can be blocking. [...] Within our*
625 *CLAHRC we have principles, and co-production was one of them, and we asked people to*
626 *reflect on what that meant for them. But it could be that a theme lead didn't really*
627 *understand or know the difference between co-production... there would be differences in*
628 *those concepts. And they could block it, or they could enable it through the use of a*
629 *resource".*

630 Therefore, senior leaders suggested a need for coordination between multiple levels of leadership to
631 enable co-production, particularly around resource allocation for co-production.

632 *"Some discontent, shall we say, [within our CLAHRC] about resources being allocated to non-*
633 *research. Resources were still allocated to non-research but there was a lot of discussion and*
634 *negotiation at senior level. And explanation as to why we have to do it".*

635

636 **Discussion**

637 We identified four tensions in doing co-production that the five collaborative research partnerships
638 had to solve differently to develop their co-production practices: 1) idealistic, tokenistic vs realistic
639 narratives; 2) Power differences and (lack of) reciprocity; 3) Excluding vs including language and
640 communication; and 4) Individual motivation vs structural issues. These tensions highlight different
641 dilemmas that the collaborative research partnerships faced in developing their co-production
642 practices, requiring each partnership to develop a response to these tensions, taking into account
643 local context, needs and existing opportunities and partnerships. Therefore, each partnership
644 responded differently, resulting in different co-production practices. In other words, these tensions
645 were productive. Below we highlight two take-away messages that we identified from our joint
646 reflections with senior leaders of these collaborations.

647

648 **Key take-away messages**

649 No gold standard: variety of co-production approaches for developing context-tailored solutions

650 Our first point of reflection is that these variations should not be reduced to one gold standard for
651 co-production but should be celebrated and understood in the context in which they were
652 developed. This will help other research infrastructures, such as the NIHR ARCs, HDRCs and social
653 care research networks, to reflect on how to practice co-production in their organisational structures

654 and context. Reimagining challenges as tensions encourages academics and health professionals to
655 articulate their positions on co-production more carefully, and also emphasises that one size does
656 not fit all in co-production.

657 Power differences underlie many of the other tensions; facilitating power sharing in co-production
658 activities is, in our experience, crucial for finding solutions to the challenges that other tensions
659 pose. This is also acknowledged in the literature by Williams et al. (37), who point to the dark
660 shadows cast on co-production, caused by underlying structural issues of power (particularly in
661 academic institutions).

662 In our study, we have shown that power sharing requires new roles and approaches from academics
663 to respond with flexibility to stakeholders' needs and changing engagement across contexts,
664 ensuring inclusive language and communication. Senior leaders need to empower junior researchers
665 to get involved in co-production by providing them with sufficient resources and co-production skills,
666 giving them enough space to experiment (and permission to fail) by changing the structures in which
667 they operate.

668 Perhaps this is the real aim of co-production in research: not to co-produce new knowledge but to
669 reconfigure the structures in which this knowledge is enacted. Miller and Wyborn (38) argued that
670 the purpose of co-production is to create new forms of governance that produce the required
671 knowledge and at the same time the social dynamics to act on this knowledge. In line with their
672 work, we propose to frame co-production as a creative space to experiment with and develop new
673 governance structures.

674

675 Addressing structural barriers: distributed leadership

676 In many of the tensions, the starting position will be determined by the vision and values of the
677 collaboration leaders. Bringing together a range of organisations and people in a new complex
678 collaboration requires the formative role of a (individual) leader to shape the architecture of the
679 collaboration, with the vision and beliefs of this leader influencing the approach to co-production.
680 However, as collaborations such as the CLAHRCs evolved over time, new models of leadership (e.g.
681 distributed leadership (39)) developed that facilitated more power sharing across the collaboration
682 (40) and strengthen structural conditions for co-production. These new models of leadership are
683 more focused on engaging stakeholders and taking account of local contextual factors, and they
684 require the individual leader to relinquish some of their control to other senior leaders in the
685 collaboration, creating more uncertainty and ambiguity that they need to feel comfortable to
686 manage (40).

687 Not every leader is keen to share power and we identified in our conversations with CLAHRC leaders'
688 differences in the extent to which senior leaders are willing to relinquish their control to others. For
689 example, the CLAHRC South Yorkshire/ Yorkshire and Humber developed a system of distributed
690 leadership. Resources were allocated to the themes and theme leads then had the power to use
691 these how they wished. The balance and use of resources really reflected the belief in co-production
692 within the theme leadership. This was visible in budget spreadsheets on how resources were spent,
693 with research often being only one component of the budget with a greater mix of funding being
694 allocated to work in co-production and spending time on priority setting with external partners.
695 However, some theme leads just used funds to do traditional research, illustrating that distributed
696 leadership gives freedom to use resource agreed at the senior level, but that this played out
697 differently at theme level.

698 ***Practical implications***

699 We recommend that the four tensions should be acknowledged and worked through by senior
 700 leaders in collaborative research partnerships as constructive dilemmas to enable effective co-
 701 production. By thinking about their responses to each challenge, senior leaders will be better able to
 702 define, resource and implement co-production practices in their work and structures. Rather than
 703 seeing these tensions as barriers, we suggest re-imagining them as a creative process that will lead
 704 to potential solutions. To support this creative process, we made suggestions for responding to each
 705 challenge and present illustrative case studies in supplementary files that illustrate how different
 706 CLAHRCs have addressed these tensions.

707 Our study demonstrates that these tensions were productive in helping collaborative research
 708 partnerships to tailor co-production practices to their local needs and existing opportunities. As a
 709 result, practices varied across partnerships, which we argue should not be reduced to one gold
 710 standard for co-production but should be celebrated. The links between the tensions informed
 711 solutions in each context, with strategic leadership identified as an important starting point;
 712 however, this role needs to be developed into more distributed forms of leadership over time to
 713 facilitate co-production practices between partners. Facilitating structures for co-production
 714 enabled power sharing through capacity and capability building, which resulted in more inclusive
 715 language and communication, and a virtuous circle resulting in more realistic practices of co-
 716 production in research.

717

718 Creating a realistic narrative around co-production

719 In this sense, the first tension is not really a challenge but an ambition: how to create a realistic
 720 narrative around co-production within a research infrastructure or organisation that is not
 721 unachievably idealistic and does not merely present a tokenistic effort? To support this ambition, the
 722 other tensions need to be resolved by making a choice about where to start with developing your
 723 co-production practices. Navigating these tensions is a craft in itself which can only be developed
 724 through practise. However, asking yourself a few questions as a team of leaders before you embark
 725 on your co-production activities together will help you work out your collective responses to the
 726 three other tensions.

727

728 **Questions for responding to the four tensions of co-production in collaborative research**
729 **partnerships:**

- 730 • What is our vision for co-production? How do we define it and embed this in our
731 organisation's strategies and structures?
- 732 • What language and communication will be helpful to share this vision within and outside the
733 collaboration?
- 734 • How much power are we willing to share with other senior leaders in the collaboration? And
735 how will we manage uncertainty and ambiguity resulting from power sharing?
- 736 • How much capacity do we have in my organisation to support co-production? And what can
737 we do to increase capacity/ capability of existing staff?
- 738 • What resources will we need to for this and how do we distribute them across the
739 collaboration?
- 740 • How can we reflect on progress in realising this ambition at regular intervals with external
741 partners?

742 Facilitating power sharing, inclusive language and co-production skills

743 Facilitating power sharing in co-production activities is, in our experience, crucial for finding
744 solutions to the challenges that other tensions pose. We suspect that a truly egalitarian sharing of
745 power within these collaborations will be hard to achieve; however, more distributed and
746 collaborative forms of leadership, facilitate co-production (22). Distributed leadership can be
747 facilitated by more inclusive processes and governance structures within collaborative research
748 partnerships, including, for example, rotation of chairing responsibilities within the team, attempts
749 to open the agenda-setting process to all team members, and efforts to make dialogue a more
750 prominent feature of the team meetings.

751 Embedding co-production practices in collaborative research partnerships can be further supported
752 by organising regular reflections with both internal and external stakeholders. For example, by
753 organising action learning sets or developing communities of practice to reflect and report on how
754 they are achieving co-production. These reflections encourage collaborative problem solving, while
755 celebrating success and learning from failure, creating more inclusive language and communication.

756 Finally, practising co-production requires a very different skill set of academic researchers in terms
757 of communication, relationship building, and power-sharing, which is not currently taught in
758 academic curriculums, and take time to master. The insights from senior leaders of collaborative
759 research partnerships shared in this paper, demonstrate that this skill set is more of a craft that
760 needs to be honed and nurtured over time.

761 We argue for the need to educate all researchers about strategies for making their research more
762 relevant, applicable, and impactful. Co-production approaches could be an important element of
763 this. At the same time, we acknowledge that deep engagement with co-production and successfully
764 addressing its tensions would require considerable experience and expertise. This could be achieved
765 by some researchers specialising in co-production methods - but also by developing the cadre of
766 knowledge brokers and hybrid roles (embedded researchers, practitioner fellows) who straddle the
767 communities of 'knowledge production' and 'knowledge application' (41).

768

769 ***Strengths and weaknesses***

770 The auto-ethnographic approach taken in this study allowed for in-depth reflections with senior
771 leaders on the tensions they faced in developing co-production practices in their collaborative
772 research partnerships and a process of collaborative sense making with research teams. This way of
773 working is illustrative of the topic of this study: not only did we co-produce the study; we also co-
774 produced this paper with the research participants. However, the findings are based on the
775 reflections of the research team and a limited number of senior leaders from collaborative research
776 partnerships, which may limit generalisability to other settings.

777 While we feel that these tensions adequately represent the most significant issues we experienced
778 in co-production in the five partnerships, we are mindful that these partnerships are set within an
779 English context and therefore different tensions might apply in other countries with different
780 governance and health systems. However, the literature suggests the ubiquity of these challenges
781 (42) and, whilst there may be much to learn from other jurisdictions where the health systems and
782 governance arrangements may differ, some of the underlying tensions that determine co-production
783 will be similar (43).

784 Our focus in this study is on the experiences and perceptions of senior leaders of the four tensions
785 and how they tried to solve these tensions. It is unknown to what degree these overarching
786 narratives were shared within individual collaborative research partnerships across different
787 members and partners. However, the findings of our study suggest the importance of formal
788 leaders' visions in shaping the partnerships' architecture and vision and, therefore, their perceptions
789 and experiences are important to focus on (40).

790 **Conclusion**

791 Despite a growing enthusiasm for co-production in healthcare services and research, there is
792 noticeable gap in the current literature on 'how-to do co-production' in large partnership structures.
793 In this auto-ethnographic study with senior leaders from five successful collaborative research
794 partnerships in the UK, we reflected on co-production practices between academics, health
795 professionals, policy makers and third sector organisations to inform practical guidance on co-
796 production for new partnerships, such as the NIHR Applied Research Collaborations (ARCs).

797

798

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923

924 **List of abbreviations**

925	ARCs	Applied Research Collaborations
926	CLAHRC	Collaborations for Leadership in Applied Health Research
927	GRiP	Getting Research Into Practice
928	NIHR	National Institute of Health and Care Research
929	PPI	Patient and Public Involvement
930	UKCRC	United Kingdom Clinical Research Centres
931	UNICEF	United Nations Children's Fund
932	WHO	World Health Organisation

933 **Declarations**

934

935 ***Ethics approval and consent to participate***

936 No ethical approval was required for this study

937

938 ***Consent for publication***

939 Not applicable

940

941 ***Availability of data and materials***

942 The datasets used and/or analysed during the current study are available from the corresponding
943 author on reasonable request.

944

945 ***Competing interests***

946 The authors declare that they have no competing interests

947

948 ***Funding***

949 Funding from the National Institute for Health and Care Research (NIHR) School for Public Health
950 Research (SPHR) is gratefully acknowledged for resourcing NH to support the data analysis and write
951 up as part of her Summer Internship. RK is partially funded by the (NIHR) Applied Research
952 Collaboration Greater Manchester (ARC-GM). PF and MC are members of the NIHR Applied Research
953 Collaboration North East and North Cumbria (NIHR200173). The views expressed in this publication
954 are those of the author(s) and not necessarily those of the National Institute for Health and Care
955 Research or the Department of Health and Social Care.

956

957 ***Authors' contributions***

958 PvdG, RK, HS, JL conceived the idea for the study, developed the study design and applied for
959 funding from NIHR SPHR. Data collection and analysis were undertaken by PvdG, NH, RK, HS and JL.

960 Data interpretation was supported by all authors (PvdG, RK, HS, JL, NH, MC, DW, JC, SM). The paper
961 was drafted by PvdG and was commented on by all authors PvdG, RK, HS, JL, NH, MC, DW, JC, SM).
962 All authors read and approved the final manuscript (PvdG, RK, HS, JL, NH, MC, DW, JC, SM).

963

964 ***Acknowledgements***

965 We would like to thank Prof Ruth Boaden from the Alliance Manchester Business School for her
966 participation in the workshop and contributing her views.

967

968 **Appendices**

969 **Appendix 1. Story line topic list for interviews**

970 **Narrative accounts of co-production in Collaborations for Leadership**
971 **in Applied Health Research and Care (CLAHRCs)**

972

973 **Introduction**

974 We are a small working group with members from five NIHR-funded Applied Research
975 Collaborations (ARCs), who share an interest in co-production. We want to understand the overall
976 narrative around co-production and capture the learning from previous CLAHRCs before developing
977 further work in this area.

978 We have approached you because you worked in a previous CLAHRC (Yorkshire & Humber, Greater
979 Manchester, East Midlands or South London), were involved in some way with co-production and
980 may be able to provide a comprehensive overview of co-production and key learning within your
981 CLAHRC.

982 Please try to answer the following questions in as much detail as you can, keeping in mind a broad
983 definition of co-production. For example, it may have been implemented as an entire methodology,
984 or at defined time points and could have been applied in a range of circumstances including projects,
985 events, training or funding applications. We are particularly interested to know about applied health
986 research and complex intervention research that used co-production.

987 Thank you for taking time to complete these questions. If you are providing a written account,
988 please expand the boxes below as needed.

989 The Cross-ARC working Group on Co-production

990 **Questions**

1. **Please can you briefly describe your CLAHRC and its approach to co-production?**

For example: To what extent did the CLAHRC engage with 'co-production'? What was the rationale for using co-production? To what extent was co-production applied intentionally/ according to known principles? Was the approach to co-production coherent across the CLAHRC?

2. **Who were the main people involved in this work within your CLAHRC?**

Please tell us about: Who led on this work in your CLARHC? Which stakeholder groups were included in the co-produced projects (e.g. public, organisations, providers etc)? Is there someone else we can contact for additional information about the co-production work within the CLAHRC?

3. **How did you apply your co-production approach across the CLAHRC?**

For example: How was co-production applied in projects, events, training and funding schemes? Was the application uniform across the CLAHRC?

4. **What learning did you take away from using co-production in your CLAHRC?**

For example: What worked well, what didn't? What were the main challenges? What would you say about the impact of the co-produced work within your CLAHRC? Did the understanding of, or competence in co-production, change over the period of the CLAHRC award?

5. **What can ARCs do to make more use of co-production going forward?**

For example: What should the ARCs do more of? What should the ARCs do differently to the CLAHRCs? What do you think are the upcoming priorities for using co-production within ARCs?

6. **Which co-production projects from your CLAHRC would be worth following up if you had to select two?**

Please give as much detail as you can: Title, project lead, contact details? Are there any publications or reports available in the public domain?

7. **What was your role in the previous CLAHRC? And which CLARHC did you work within?**

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993

994

THANK YOU

995 **Appendix 2. Resource pack for interactive workshop**

996 **Pre-discussion resource pack for authors**

997 **Instructions**

998 Our emerging analysis identified six tensions that were apparent when applied health research was co-
 999 produced within the CLAHRCs. We'd like your comments and suggestions for each of the findings, so that we
 1000 can refine them for the journal paper we will write together. Please use the table below and the cut and re-
 1001 arrange exercise to capture your thoughts about the findings. Please bring your ideas and suggestions to our
 1002 group discussion on [insert date and time].

<p>6 tensions...</p>	<p>YOUR comments here please </p>
<p>1 Idealistic, tokenistic vs realistic narratives Some co-produced applied research can be tokenistic with passive collaboration and less emphasis on empowerment, equality and inclusion; yet 'gold standard' co-production may not be achievable (and may put people off trying).</p>	
<p>2 Power differences and (lack of) reciprocity Academics often see themselves as 'experts' and need to recognise 'experts by experience' as equally powerful; everyone involved should gain from co-productive evidence generation.</p>	
<p>3 Excluding vs including language and communication The use of 'research' jargon and the communication style of researchers can exclude partners involved in co-production such as service users, managers or practitioners.</p>	
<p>4 Research vs non-research activities Co-producing evidence means researchers enabling people's involvement, building relationships, partnership engagement and facilitation; academic institutions tend not to recognise or reward these non-research activities.</p>	
<p>5 Traditional academic ways of working vs new ways of generating and disseminating evidence Traditional academic ways of producing evidence value objectivity and separation of researchers and participants, whereas working in a co-productive way involves generating experiential knowledge, sharing of roles, and more dynamic and equitable relationships across the research cycle. Traditional academic outputs (i.e. published papers) may not hold the same value to stakeholders.</p>	
<p>6 Strategic leadership vs capacity on the ground Leaders played a critical role in envisioning co-production within CLAHRCs although the capacity to enact and use co-production in individual projects varied.</p>	
<p>ANY other comments or suggestions?</p>	

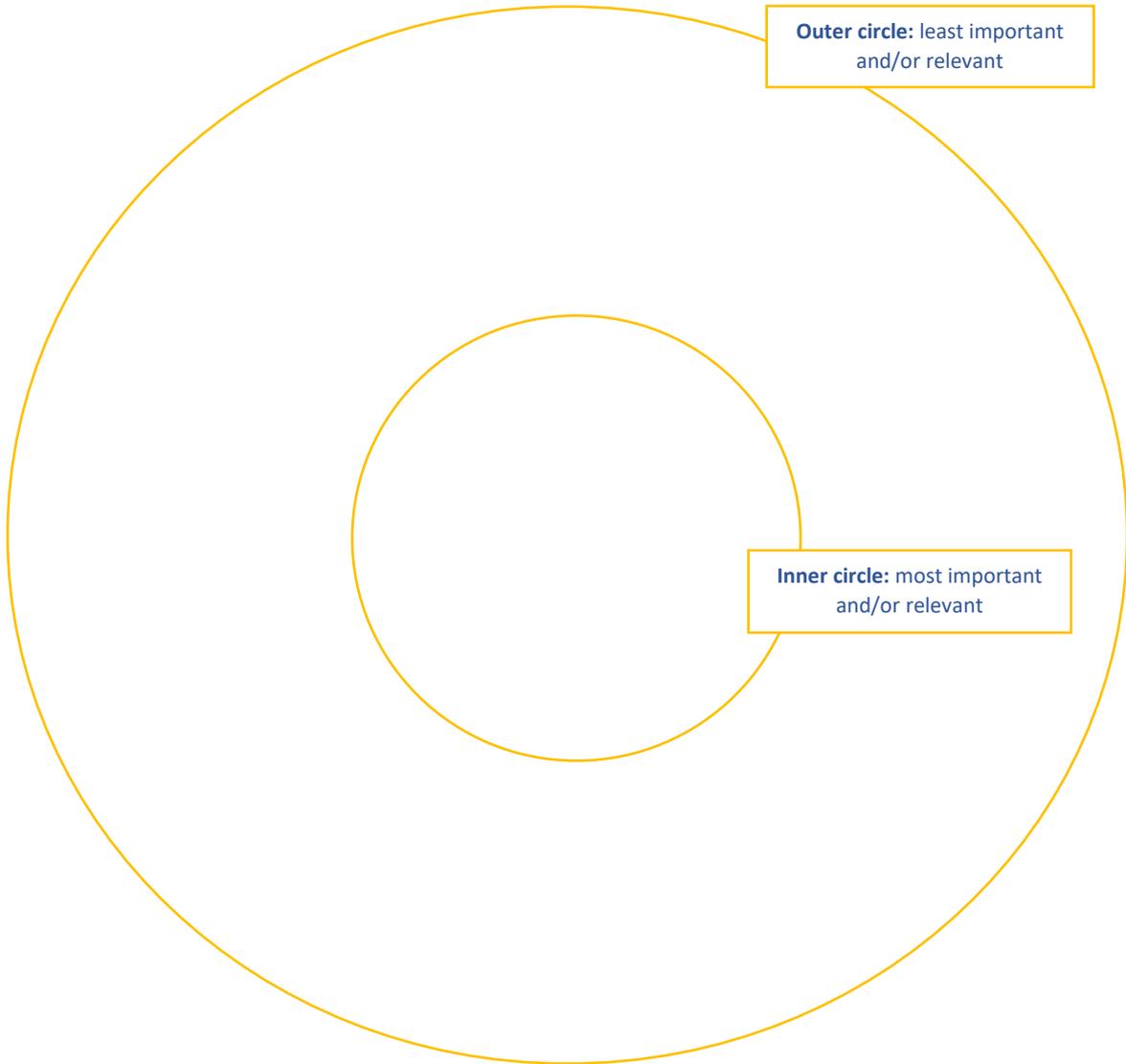
Please cut out the six tensions cards below	Blank cards Use these to re-phrase or add new tensions
1 Idealistic, tokenistic vs realistic narratives	1
2 Power differences and (lack of) reciprocity	2
3 Excluding vs including language and communication	3
4 Research vs non-research activities	4
5 Traditional academic ways of working vs new ways of generating and disseminating evidence	5
6 Strategic leadership vs capacity on the ground	6

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1004

Now re-arrange the cards according to how important and/or relevant they are to the present Applied Research Collaborations (ARCs):

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1016 **Manuscript abstract**

1017 *Working title:* Practical insights on doing co-production: reflections on co-produced research
1018 projects in five UK collaborative research partnerships between 2008-2018

1019 *Summary of the paper*

1020 *Background*

1021 Despite a growing enthusiasm for co-production in healthcare services and research, research on co-
1022 production practices is lacking. An abundance of conceptual frameworks, guidelines and principles is
1023 available but little empirical research is conducted on the ‘how to do’ co-production of research
1024 evidence to improve health care services. This paper brings together leadership insights from
1025 collaborative research partnerships in the UK on practicing co-production with the aim to inform
1026 practical guidance for new partnerships facilitating co-production of applied health research.

1027 *Methods*

1028 Using an auto-ethnographic approach, experiential evidence was elicited through collective sense
1029 making from conversations between the research team and leaders of five collaborative research
1030 partnerships. This approach applies a cultural analysis and interpretation of the leads’ behaviours,
1031 thoughts and experiences of co-production between 2008 and 2018 in relation to the academics,
1032 health practitioners, policy makers and local communities/ third sector organisations involved in co-
1033 produced research projects within the collective research partnerships.

1034 *Results*

1035 The findings highlight a variation of practices across CLAHRCs with the context in which co-
1036 production occurs largely determining the nature of the process and outcomes. We identified six
1037 tensions in doing co-production, such as 1) idealistic, tokenistic vs realistic narratives, 2) power
1038 differences and (lack of) reciprocity, 3) excluding vs including language and communication, 4)
1039 research vs non-research activities, 5) traditional academic ways of working and publishing vs new
1040 way of generating and disseminating evidence, and 6) strategic leadership vs capacity on the ground.

1041 *Conclusions*

1042 To overcome identified tensions in practicing co-production of research, NIHR ARCs need to be
1043 explicit about the tensions, be pragmatic about how to tailor co-production to their context and
1044 enact it at their lowest level. Imposing one model for co-production needs to be avoid in favour of
1045 identifying relevant levers for change in each context. Therefore, we propose a matrix of co-
1046 produced activities to enable leads in these collaborations to match context, actors and purpose
1047 with appropriate co-production activities. Based on this matrix we provide practical guidance on
1048 how best to support co-production in different structures and projects.

1049

1050

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1053 **Supplementary Files. Case studies of the four tensions.**

1054

1055 1) Idealistic, tokenistic vs realistic narratives

1056 **Case study CLAHRC SY/YH: Getting Research Into Practice (GRiP)**

1057 CLAHRC partners in Yorkshire and Humber could apply for funding to undertake a Getting Research
 1058 into Practice (GRiP) project by submitting a written proposal of maximum four pages. The funding
 1059 supported the release of staff from Sheffield Teaching Hospitals NHS FT to conduct a research
 1060 project on an aspect of care provided to patients that could be improved through implementing
 1061 evidence into practice. GRIP projects were supported by members of the Translating Knowledge into
 1062 Action theme of NIHR CLAHRC Yorkshire and Humber, with up to three projects funded per year and
 1063 a maximum of £12,000 for each project. A case book was produced at the end of the CLAHRC to
 1064 highlight various GRIP projects and the impact they had on practice.

1065 One of the GRIPs projects explored ways to promote exercise in stroke survivors living in Sheffield,
 1066 using co-production workshops to better understand support from the service users' point of view.
 1067 The multi-disciplinary project team, composed of health professionals and designers, used
 1068 storytelling and visuals to explore myths around exercise after stroke, and to identify key barriers
 1069 and enablers of services provided in Sheffield. They also co-facilitated a series of five workshops to
 1070 develop design briefs for creating an ideal service, with support from product design course students
 1071 at Sheffield Hallam University, who were paired with stroke survivors and healthcare professionals.

1072 This resulted in briefs for a communications campaign to counter myths and promote physical
 1073 activity, a staff training package to help the consistent delivery of information regarding exercise
 1074 after a stroke, and the creation of a stroke survivor's 'passport', giving them access to relevant and
 1075 customised information and keeping their medical information in one place. Briefs were shared with
 1076 teams across the world to seek funding for developing a prototype to test in stroke wards. For more
 1077 information about GRIP, please see: <https://clahrcyh.wordpress.com/2016/03/03/getting-research-into-practice-grip-2016-sheffieldhosp-shcfundraising/> .
 1078

1079

1080 2) Power differences and (lack of) reciprocity

1081 **Case study CLAHRC South Yorkshire/Yorkshire and Humber: Power differences between academics**

1082 In the CLAHRC South Yorkshire a Knowledge Mobilisation theme was led by a senior academic, while
 1083 another theme was led by a trialist medic. Both were senior professors in their field; very much
 1084 driven and fashioned by their considerable experience: one through positivist and
 1085 experiment(induction); the other driven by theory application (deduction). They respected each
 1086 other (based on their perceived places in respective hierarchies) and understood that their ways of
 1087 knowing were different. However, the introduction of collaborative co-production and critical
 1088 theory/ creative design approaches working was a step too far. They just did not get it and did not
 1089 use the KM theme's expertise, as they did not consider it as real research.

1090 There were also power differences within themes. For example, in the CLAHRC's Obesity theme. We
 1091 wanted to develop priorities for the theme and do this with services. The priority setting groups
 1092 included surgeons and public health practitioners. The first group wanted to prioritise tertiary gastric
 1093 bands and gastric balloons and evaluate this. The second group wanted to look at true prevention,
 1094 such as sugar tax and changes to the obesogenic environment. Both groups could not compromise

1095 and there were real tensions and power issues amongst these stakeholders. In the end we
1096 developed collaborative groups working at different stages of prevention to separate the tensions.

1097

1098 3) Excluding vs including language and communication

1099 Language and communication

1100 **Case study CLAHRC Yorkshire and Humber: importance of collaborative agreements between**
1101 **researchers and industry partners**

1102 As an example of research co-production challenges, CLAHRC YH undertook the implementation and
1103 evaluation of a project known as the Enhanced Community Palliative Support Service (EnComPaSS),
1104 working with the voluntary sector, commissioners and an industry partner. This workforce
1105 transformation project in end-of-life care was coproduced from its inception with shared decision-
1106 making between knowledge users and researchers, centred around mutual learning and respect
1107 (Ariss et al 2021). The success of this project partly lay in the ability of our industry partners to be
1108 nimble and responsive to changes in the digital platform requested by clinical teams. However, at
1109 times the expectations of both with regards to the feasibility of changes was unreasonable and
1110 expectations had to be carefully managed. For example, the need to be clear about foreground and
1111 background IP were crucial for new pathway models and novel workforce developments when
1112 undertaken in a co-produced way. We learnt the importance of collaborative agreements between
1113 our industry partners and all other collaborators in this project. For more information about GRiP,
1114 please see: <https://clahrcyh.wordpress.com/2016/03/03/getting-research-into-practice-grip-2016-sheffieldhosp-shcfundraising/> .
1115

1116

1117 Motivation versus skills

1118 **Case study CLAHRC South Yorkshire: utilising different skills sets**

1119 The CLAHRC South Yorkshire developed a three-monthly reporting system that asked theme leads to
1120 report on what they were undertaking within their theme based on our principles, with one being
1121 co-production. The reporting system worked as a mechanism to share and learn from one another in
1122 using co-production skills.

1123 In addition, the CLAHRC South Yorkshire used their Research Capacity Funding to encourage cross
1124 fertilisation of ideas and undertake joint projects together. Themes that were experienced in co-
1125 production had an opportunity to use these skills with other research themes. This was sometimes
1126 successful, leading to more sustained partnerships, but also sometimes did not work. For more
1127 information on the CLAHRC South Yorkshire approach to co-production, please see:
1128 https://www.researchgate.net/publication/237151605_NIHR_CLAHRC_for_South_Yorkshire_International_Evaluation_Report_November_2011_Executive_Summary .
1129

1130

1131 **Case study Fuse: AskFuse, a responsive research and evaluation service for public health**
1132 **practitioners and policy makers**

1133 In June 2013, after extensive consultation with local stakeholders and partners, Fuse launched
1134 AskFuse: a rapid response and evaluation service to provide decision makers and practitioners with
1135 an easy-to-access portal for public health evidence in the North East of England. The service aims to
1136 respond to a broad range of research requests from the health, well-being or social care sectors.

1137 The post of AskFuse Research Manager was created to provide a single point of contact for all
1138 AskFuse enquiries and to coordinate this service for each client from start to finish. In an initial
1139 conversation, the partner's needs are explored; the nature and timescale of any further work is then
1140 agreed over a few meetings (with no obligation or fee), resulting in a research brief for researchers.
1141 The costs of any work agreed, and outputs, will be discussed at this stage. The Research Manager
1142 then liaises with Fuse senior investigators and staff at the five universities in the North East of
1143 England to identify capacity and skills to develop, commission, lead and undertake research projects.

1144 Between June 2013 and January 2022 over 400 enquiries have been supported by the service
1145 resulting in more than 150 collaborative research projects and various co-produced knowledge
1146 exchange events. However, the knowledge brokering process facilitated by the service has not been
1147 without its challenges. For instance, considerable time is often needed to turn enquiries into a
1148 format which is 'researchable', in part because of unreal expectations. Secondly, local funding for
1149 agreed research projects was generally limited, while academic enthusiasm for supporting these
1150 projects was sometimes dampened by a lack of institutional incentives to engage in knowledge
1151 exchange. Finally, developing AskFuse proved particularly challenging in a time of significant system
1152 upheaval in the NHS. This also changed the types of evidence that were valued by enquirers, with
1153 more emphasis being put on implementation advice from qualitative or realist designs.

1154 For more information on AskFuse, please see: Van Der Graaf P, Shucksmith J, Rushmer R, Rhodes A,
1155 Welford M. Performing collaborative research: a dramaturgical reflection on an institutional
1156 knowledge brokering service in the North East of England. Health research policy and systems.
1157 2019;17(1):1-9. Or visit: www.fuse.ac.uk/askfuse .

1158

1159 4) Individual motivation vs structural issues

1160 **Case study Fuse: community-centred approaches to public health/ Impact of Universal Credit in**
1161 **North East England: a qualitative study of claimants and support staff**

1162 The need for the study emerged from embedded research undertaken by an academic researcher
1163 within Fuse working with local community groups in Gateshead and drawing on their priorities and
1164 experiences. Keen to explore the potential health and social impact of Universal Credit (UC) on
1165 residents, Gateshead Council commissioned the study. Local stakeholders were involved in the
1166 conduct of the study and in the dissemination of findings.

1167 33 UC claimants with complex needs, disabilities and health conditions and 37 staff from local
1168 government, housing, voluntary and community sector organisations were interviewed and took
1169 part in focus groups to share their accounts of the UC claims process and the consequences of
1170 managing on UC. The findings add considerable detail to emerging evidence of the deleterious
1171 effects of UC on vulnerable claimants' health and wellbeing with evidence suggesting that UC is
1172 undermining vulnerable claimants' mental health, increasing the risk of poverty, hardship,
1173 destitution, and suicidality.

1174 The resulting findings were presenting in person to the House of Commons Work and Pensions
1175 Select Committee and were cited in a report calling on the Government to provide financial support
1176 to people waiting for their first Universal Credit payment.

1177 For more information about this study, please see: Cheetham M, Moffatt S, Addison M, Wiseman A.
1178 Impact of Universal Credit in North East England: a qualitative study of claimants and support staff.
1179 BMJ open. 2019 Jul 1;9(7):e029611.