



*Citation for published version:*

Byrne-Davis, L, Eleanor, B, Burton, A, Dharni, N, Gillison, F, Maltinsky, W, Mason, C, Sharma, N, Armitage, C, Johnston, M & Byrne, G 2017, 'How behavioural science can contribute to health partnerships: the case of The Change Exchange', *Globalization and Health*, vol. 13, no. 30. <https://doi.org/10.1186/s12992-017-0254-4>

*DOI:*

[10.1186/s12992-017-0254-4](https://doi.org/10.1186/s12992-017-0254-4)

*Publication date:*

2017

*Document Version*

Peer reviewed version

[Link to publication](#)

*Publisher Rights*

CC BY

**University of Bath**

**Alternative formats**

If you require this document in an alternative format, please contact:  
[openaccess@bath.ac.uk](mailto:openaccess@bath.ac.uk)

**General rights**

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

1 How behavioural science can contribute to health partnerships: the case of  
2 The Change Exchange  
3  
4 Byrne-Davis, L.M.T,\* , University of Manchester, Stopford Building, Oxford  
5 Road, Manchester, M13 9PT, UK lucie.byrne-davis@manchester.ac.uk  
6 Bull, E.R., University of Manchester, Stopford Building, Oxford Road,  
7 Manchester, M13 9PT, UK eleanor.bull@manchester.ac.uk  
8 Burton, A. Staffordshire University, Science Centre, Leek Road, Stoke-on-  
9 Trent, ST4 2DF, UK amy.burton@staffs.ac.uk  
10 Dharni, N., Bradford Institute for Health Research, Duckworth Lane, Bradford,  
11 BD9 6RJ, UK Nimarta.Dharni@bthft.nhs.uk  
12 Gillison, F, University of Bath, Claverton Down, Bath, BA2 7AY  
13 F.B.Gillison@bath.ac.uk  
14 Maltinsky, W. Inverness College University of the Highlands and Islands  
15 1 Inverness Campus, Inverness, IV2 5NA, UK Wendy.Maltinsky.ic@uhi.ac.uk  
16 Mason, C., NHS Grampian, Public Health Directorate, 2 Eday Road,  
17 Aberdeen, AB15 6RE, UK corina.mason@nhs.net  
18 Sharma, N., University of the West of England, Frenchay Campus,  
19 Coldharbour Lane, Bristol, BS16 1QY, UK nisha687@gmail.com  
20 Armitage, C., University of Manchester, Stopford Building, Oxford Road,  
21 Manchester, M13 9PT, UK chris.armitage@manchester.ac.uk  
22 Johnston, M. University of Aberdeen, Health Sciences Building, Foresterhill,  
23 Aberdeen, AB25 2ZD, UK m.johnston@abdn.ac.uk  
24 Byrne, G.J. Head Education England, 3 Piccadilly Place, Manchester, M1  
25 3BN, UK ged.byrne@nhs.net

26 Hart, J.K., University of Manchester, Stopford Building, Oxford Road,

27 Manchester, M13 9PT, UK jo.hart@manchester.ac.uk

28 \*corresponding author

29

30 Abstract

31 Background

32 Health partnerships often use health professional training to change practice  
33 with the aim of improving quality of care. Interventions to change practice can  
34 learn from behavioural science and focus not only on improving the  
35 competence and capability of health professionals but also their opportunity  
36 and motivation to make changes in practice. We describe a project that used  
37 behavioural scientist volunteers to enable health partnerships to understand  
38 and use the theories, techniques and assessments of behavioural science.

39 Case Studies

40 This paper outlines how The Change Exchange, a collective of volunteer  
41 behavioural scientists, worked with health partnerships to strengthen their  
42 projects by translating behavioural science *in situ*. We describe three case  
43 studies in which behavioural scientists, embedded in health partnerships in  
44 Uganda, Sierra Leone and Mozambique, explored the behaviour change  
45 techniques used by educators, supported knowledge and skill development in  
46 behaviour change, monitored the impact of projects on psychological  
47 determinants of behaviour and made recommendations for future project  
48 developments.

49 Discussion

50 Challenges in the work included having time and space for behavioural  
51 science in already very busy health partnership schedules and the difficulties  
52 in using certain methods in other cultures. Future work could explore other  
53 modes of translation and further develop methods to make them more  
54 culturally applicable.

55 Conclusion

56 Behavioural scientists could translate behavioural science which was  
57 understood and used by the health partnerships to strengthen their project  
58 work.

59

60 Keywords: implementation science, behaviour, health partnerships

61

62 Background

63 The Tropical Health and Education Trust state that health partnerships,  
64 collaborations between high-income countries and low- and middle income  
65 countries (LMIC), “strengthen health systems through health service skills  
66 transfer and capacity development”[1]. Health partnerships have been a  
67 mainstay of capacity building in LIC. Training is often the go-to solution when  
68 changes in health professional practices are required, and our experience  
69 tells us that health partnerships are no different. Miller’s pyramid, well known  
70 in medical education [2], neatly shows the building blocks of practice from  
71 knowing and knowing how, through showing how and all the way to ‘does’.  
72 Educators typically assess the efficacy of their training through measures of  
73 knowledge and skill and sometimes by monitoring changes on ‘does’ through  
74 audit and / or impact on patient outcomes. Following a theory of change  
75 approach [3], health partnership projects are usually required to propose links  
76 from education, through changes in practice to impact on patient outcomes.  
77 However, there is little focus on *how* ‘shows how’ becomes ‘does’ Thus, the  
78 actual factors that determine whether ‘shows how’ ever becomes ‘does’ are  
79 typically not used to evaluate the efficacy of training or, more widely, the

80 efficacy of health partnerships. We propose that examining change at this  
81 granular level has benefits for health partnership projects and in this paper,  
82 we describe The Change Exchange: a project in which nine behaviour change  
83 consultants were placed within four health partnerships. In it, we explore their  
84 activities, and the potential impact they could have through three case  
85 studies.

86 Although the focus of Health Partnerships is often on education and training,  
87 they do, of course, include techniques other than those to improve only  
88 knowledge and skills in their education. Many continuing professional  
89 development (CPD) activities present a rationale for people to change their  
90 practice or involve reflection on barriers to adopting the new practices. Implicit  
91 in these activities is an underlying theory of how behaviour changes. Although  
92 activities that target more than skills and knowledge are undoubtedly  
93 occurring, we have not yet explored whether partnerships could be more  
94 effective if behavioural science became more systematically and explicitly  
95 incorporated. Whether and in what circumstances knowledge and skills are  
96 translated into action has received considerable research attention in the  
97 fields of behavioural science, implementation science and their root science of  
98 psychology [4–6].

99 Behavioural science draws from a wide range of theories involving both  
100 conscious and unconscious processes but CPD activities, aimed at changing  
101 behaviour, tend to be restricted to addressing conscious, reflective thoughts  
102 and attitudes. Healthcare professional behaviour, like all human behaviour, is  
103 influenced by both types of process –not just what we believe but also our  
104 emotions, needs and habits [7,8].

105 Behavioural scientists have developed the Behaviour Change Technique  
106 Taxonomy (BCTT) [9] which groups over 90 behaviour change methods into  
107 16 types. These techniques might be useful for educators to identify or adopt  
108 in their training if they are to change practice of trainees.

109 The application of theory improves our ability to change behaviour [10]. This  
110 is because our ability to change behaviour relies on the intervention targeting  
111 the correct mechanism(s) of action. Theories of how behaviour changes  
112 include mechanisms of action and therefore our interventions become more  
113 focused on determinants of change. However, the complexity and sheer  
114 number of theories may limit both the likelihood that theory is applied. An  
115 early attempt at summarising and synthesising [11] may have increased the  
116 use of behavioural science theory in the implementation of evidence-based  
117 practice and a recent framework makes the main ideas even more accessible:  
118 behavioural influences can be thought about using the broad categories of  
119 capability, opportunity, and motivation (The COM-B framework) [12].

120 Capability includes knowledge and skills, opportunity includes physical  
121 opportunity (environment) and social opportunity (social pressure and norms),  
122 and motivation encompasses many aspects of explicit decision-making (e.g.,  
123 weighing up pros and cons), as well as the influence of habit and automaticity  
124 in behaviour. The 'B' in the framework is 'behaviour'. Although the many  
125 behaviour change theories (over 80 were found a recent review [10]) are  
126 complex and overlapping, the simplicity of the COM-B model provides  
127 educators with an opportunity to access behaviour change theory.

128 We would argue that there is efficacy and efficiency benefits from using more  
129 behavioural science theory in health partnerships. The consequences of a

130 lack of engagement with behavioural science theories and methods has been  
131 a lack of explicit and systematic incorporation of behaviour change techniques  
132 (BCT) in education and a lack of monitoring the impact of education on the  
133 determinants of practice beyond competence. In other words, there has been  
134 an overt focus on the 'C' of the COM-B framework.

135

### 136 Case Studies

137 The Change Exchange is a project, funded by the Health Education England  
138 Global Health Exchange and the DFID funded Health Partnership Scheme  
139 and managed by the Tropical Health and Education Trust, with the remit of  
140 strengthening health partnerships by using behavioural science [13]. The  
141 project was developed after experiences of assisting a specific health  
142 partnership deliver and understand the impact of training in acute illness  
143 management in Uganda [14–17]. During that partnership, we proposed three  
144 ways that behavioural science could contribute to strengthening the activities  
145 of health partnerships, by reconceptualising training in terms of behaviours  
146 (the 'behaviour' of the COM-B) as opposed to knowledge and skills (the  
147 'capability' of the COM-B). Firstly, we could enhance *interventions* by  
148 observing educational interactions, noting the BCTs used, and making  
149 recommendations on how to adapt existing content or add new BCTs that  
150 target opportunity and motivation, as well as capability, thus making behaviour  
151 change more likely. Secondly, we could offer *assessment methods* by  
152 tailoring questions to ask participants that would assess not only their  
153 capability but also their opportunity and motivation to perform specific tasks  
154 set out by the education and training, thus identifying barriers and facilitators



155 to changes in practice that could be targeted, not only changes in knowledge  
156 and skills. Thirdly, we could facilitate *evaluations*, by building the capacity of  
157 health partners to engage in robust data collection for evaluation and research  
158 of their partnership, with a specific focus on changing practice. The following  
159 case studies will describe the implementation of these three: enhancing  
160 interventions, offering assessment methods and facilitating evaluations.

161

162 Case Example 1: Enhancing interventions and offering assessment methods  
163 in obstetric care in Masaka, Uganda

164 The aim of the health partnership between the Royal College of Obstetricians  
165 and Gynaecologists (RCOG) and Kitovu Hospital is to improve obstetric care  
166 and reduce the incidence of obstetric fistula in the Masaka region of Uganda  
167 by co-ordinating and delivering a training package ('Excellence in: Obstetric  
168 Skills'). The course is a three-day programme of lectures, workshops and  
169 skills clinics incorporating a train-the-trainer model, to ensure the sustainability  
170 of the programme and the transfer and retention of skills from UK faculty to  
171 local health care professionals.

172 Pairs of behavioural consultants firstly observed, reviewed and coded the  
173 BCTs in both the training of health professionals, and in training new course  
174 facilitators, using the BCT Taxonomy [9]. The functions of these BCTs were  
175 then explored in terms of the COM-B model to identify potential gaps in the  
176 provision of behavioural support.

177 As expected for a skills training programme, many techniques were present to  
178 support capability (e.g., didactic teaching and providing opportunities to learn  
179 and practice skills). Some techniques to improve reflective *motivation* (e.g.

180 verbal persuasion, setting positive outcome expectancies) and automatic  
181 processes (e.g., using mnemonics) were observed. However, there was  
182 limited techniques addressing types of motivation associated with sustained  
183 change (i.e., 'autonomous' motivation, which is based on one's personal  
184 values, rather than facilitated through coercion (feeling one 'should') or  
185 external contingencies (rewards or penalties) [18]; and habit formation). Few  
186 techniques were observed to support physical and social *opportunities* for  
187 implementation of change to practice.

188 Observations of the course were supplemented by visits to health centres to  
189 observe trainees within their working environment, and focus groups with  
190 delegates from the course. These sources exemplified the importance of poor  
191 *opportunity* in limiting the implementation of changes in practice. This was  
192 evident both through limited environmental opportunities, including the lack of  
193 resources and basic equipment, opportunities for hands-on practice as a  
194 result of low levels of attendance at health centres by labouring women and  
195 limited CPD opportunities for healthcare workers. Similarly, consultants  
196 identified the lack of social opportunity as a factor limiting changes in practice,  
197 finding it hard to influence colleagues to bring about necessary changes in  
198 procedures.

199

200 We made recommendations to the RCOG team, based on the COM-B  
201 Framework [12], for changes to be implemented in the next iteration of the  
202 course. To target autonomous *motivation* we recommended to a) incorporate  
203 more examples of the benefits Ugandan trainees had found from changing  
204 their practice (i.e., presenting a locally relevant, meaningful rationale for

205 change), and b) modify action planning activities to include personalised  
206 goals. To foster more automatic *motivation* (i.e., cue-response behaviours) we  
207 recommended the development of posters to be displayed in health centres  
208 acting as behavioural cues to action. To foster social *opportunity*, the use of  
209 social media platforms such as, Facebook and WhatsApp groups were  
210 recommended, which could be accessed from even the most remote areas.  
211 Finally, recommendations were made to embed education in behaviour  
212 change techniques explicitly into the materials for UK course facilitators and  
213 Ugandan trainers.

214 To action our final recommendation, we were invited by the RCOG to  
215 contribute behavioural science training to the train-the-trainer programme for  
216 both the UK and Ugandan professionals. Through the same set of activities of  
217 the training course (lectures, workshops and skills practice) training was  
218 provided on motivational support. Specifically, we addressed how  
219 motivational techniques could be used to motivate co-workers to change their  
220 practice and be implemented in outreach activities to encourage greater use  
221 of health centres by local women rather than receiving care from a local  
222 birthing attendant. Ugandan trainers were provided with instruction and  
223 mentoring on how to guide and motivate new trainees (e.g., provide critical  
224 feedback in a positive way). Overall, the inclusion of behavioural science led  
225 to improvements in the interventions within the education and training and  
226 also the inclusion of behavioural theories and techniques within the masters  
227 training project.

228

229 Case Example 2: Assessment of Capability, Opportunity and Motivation in  
230 Mozambique and Sierra Leone  
231 Mozambique  
232 The Ipswich-Beira partnership aims to connect specialist health professionals  
233 in Ipswich Hospital Trust, UK and Beira Central Hospital, Mozambique to  
234 share expertise and offer practical assistance to improve hospital services for  
235 local people in Beira. One current focus of the partnership is medication  
236 safety, including implementing a revised inpatient prescription chart (known as  
237 a cardex in Mozambique). The partners had worked over several years to  
238 adjust the cardex to include medication safety features including a box to alert  
239 prescribers to allergies, pregnancy or other important information. However, it  
240 was unclear how widely the cardex was being used and ward staff views on  
241 its use had not been systematically sought or analysed.

242

243 We audited the use of the cardex across the 23 hospital wards: 6 had  
244 implemented the cardex and two were actively using it. We explored medical  
245 staff members' perceptions of using the new chart through short,  
246 opportunistic, one-to-one interviews. Initially, we ascertained from ward  
247 nurses which cardex was routinely used and then asked open questions such  
248 as 'what do you think of the new cardex?' 'How easy/difficult is it/would it be to  
249 use?' 'What would make it more/less likely for you to use the cardex?' 'In what  
250 way could it be improved?' Following this, we grouped responses into themes  
251 using the overarching behavioural COM-B framework and made key  
252 recommendations.

253

254 From our analyses, physical capability and physical opportunity were key  
255 areas to target to facilitate the implementation of the new cardex. In terms of  
256 capability, some nurses felt unsure of how to complete the information  
257 required in the allergies box and of whose responsibility it was to sign the new  
258 cardex. We recommended that these be addressed through short ward-based  
259 practical training during the rollout of the new cardex led by a 'credible source'  
260 such as the nursing director, which would also recommend that staff seek  
261 social support from other staff if unsure. Staff reported that the new cardex  
262 took no additional time to complete, a key physical opportunity facilitator for  
263 implementation and for medication safety on busy acute wards [19].  
264 However, most respondents felt that the cardex layout was an opportunity  
265 barrier to completion, important since practice change is more likely when the  
266 new behaviour is easy and attractive to adopt [20]. Therefore we  
267 recommended space-saving changes such as increased box heights,  
268 changing the numbering of days to prompt correct use of the cardex and  
269 reorganising and grouping medication types, the latter being since  
270 polypharmacy is associated with increased medication error rate [21]. Users  
271 and non-users of the new cardex alike appeared highly motivated to use the  
272 new cardex, reporting that it would improve patient safety and that the prompt  
273 words for allergies and pregnancy helped staff remember to ask these  
274 things. The findings and recommendations were highlighted in our interim  
275 report for all partners, as well as through a short presentation delivered to the  
276 Nursing Director who had requested this work, the Medical Director and other  
277 key stakeholders in Beira.  
278

279 During a second partnership visit to Beira in November 2016, we repeated  
280 the auditing process visiting 17 wards (six had closed for building work since  
281 the previous visit). This time, four wards were actively using the new cardex.  
282 In our return visit to the partnership in November 2016, no further versions of  
283 the cardex had been produced by the partnership. In a discussion with two  
284 Pharmacists leading this project, they advised that opportunity barriers had  
285 prevented this: time and budget shortages, but they looked forward to  
286 presenting the cardex at a conference next June with hopes that it would be  
287 adopted nationally. Although recommendations have not been implemented  
288 to date, the audit and interviews, feedback and recommendations framed  
289 around the COM-B framework, gave a clearer picture of the cardex  
290 implementation to the health partnership. The use of the COM-B framework  
291 ensured that the issue of implementation of the cardex system was viewed  
292 from the three perspectives of capability, opportunity and motivation.  
293 Therefore, taking a behavioural approach led to recommendations that future  
294 interventions, to improve cardex system use, should focus on all three areas  
295 i.e., go beyond training healthcare professionals to use the system and look at  
296 the implementation in terms of how the systems encourage or discourage  
297 healthcare professionals to use the cardex.

298

299 Sierra Leone

300 The partnership between Plymouth University Peninsula Schools of Medicine  
301 and Dentistry (PUPSMD) and Masanga, Sierra Leone, aims to improve the  
302 resilience of the people of Sierra Leone towards outbreaks of highly infectious  
303 diseases, including Ebola. The partnership uses virtual learning and

304 computer gaming technology to deliver education and training to healthcare  
305 professionals and community members, regarding the steps to take if a highly  
306 infectious disease is suspected or found in a family member or friend. Due to  
307 the training being delivered via a tablet device, we could work with the  
308 partnership to design questionnaires that would be delivered either before or  
309 after the training, on the same tablet device. The questionnaire assessed the  
310 capability, opportunity and motivation of the healthcare workers and  
311 community members to do the behaviours required of them, as per the  
312 training. We cluster randomised groups of people undergoing the training so  
313 that some of them received the questionnaire before training and some  
314 afterwards. We were then able to compare those two groups and could draw  
315 inferences about the impact of the training on expected behaviours and  
316 determinants of behaviours i.e., capability, opportunity and motivation. We  
317 found that healthcare professionals found it difficult to answer Likert response  
318 scales (scales of 1 to 7 with 1 indicating strongly disagree to 7 indicating  
319 strongly agree). This led to us training a partnership team member to conduct  
320 focus groups, so that she could explore the capability, opportunity and  
321 motivation barriers to the specific desired behaviours in more depth with the  
322 healthcare professionals. The results of the questionnaires and focus groups  
323 will be reported elsewhere, by the partnership team.

324 The behavioural approach taken meant that both health partnerships learnt  
325 more about determinants of practice, we could assess these and they were  
326 able to feed that information back into the development of their education and  
327 training and into evaluation of their project work.

328

329 Case Example 3: Knowledge and skills for behaviour change evaluation in  
330 Uganda

331 Our final case study focuses on the MOMENTUM project: a health partnership  
332 between the Royal College of Midwives (RCM) and the Ugandan Private  
333 Midwives' Association (UPMA). Momentum was developed in response to two  
334 pressing needs; the high maternal and neonatal mortality rates in Uganda;  
335 and the outcome of the Global Midwifery Twinning Project [22]. The Global  
336 Midwifery Twinning Project identified the need to develop national standards  
337 for learning and assessment in practice, support midwives to improve their  
338 mentorship skills and develop a work-based learning module to prepare  
339 midwives for mentorship. To address these goals, the RCM and UPMA jointly  
340 delivered a 20month project to develop a model of MENTorship for Ugandan  
341 Midwifery (MOMENTUM). Training in Uganda was delivered at the start of the  
342 project, with two further workshops spaced roughly six months apart. In  
343 addition, seven Ugandan midwives who were acting as mentors to student  
344 midwives were twinned with UK midwives for knowledge, skill and mentoring  
345 support. Our objective was to establish how health behaviour change theory  
346 could enhance the impact and sustainability of the project

347 Four behavioural consultants undertook three visits (two on the first and a  
348 further two on the second and third) to Uganda in January, June and  
349 November 2016. In the first visit, the consultants introduced, to the RCM and  
350 the UPMA, the COM-B, the importance of a behavioural approach to health  
351 professional practice change and started to develop the underpinning  
352 relationships between behavioural scientists and the partnership team. The  
353 second visit aimed to establish how behaviour change theory could be useful



354 to the project's aims of maximising the training of student midwives through  
355 mentoring. Drawing on the Theoretical Domains Framework (TDF) [23,24],  
356 our observations, interviews and discussion groups, and visits to two  
357 contrasting midwifery settings, we gleaned an understanding of the behaviour  
358 changes that had been experienced as part of the project, and what future  
359 changes were anticipated and the behavioural determinants of those  
360 changes. It was apparent that the project drew on several of the constructs of  
361 the TDF with greater emphasis on social support, which related to both social  
362 opportunity (believing that people want you to engage in particular  
363 behaviours) and reflective motivation (desires to make practice changes),  
364 within the COM-B framework. Furthermore, midwives appeared more  
365 competent in their mentoring roles and providing more optimal learning  
366 environments for students.

367 The original proposal for the MOMENTUM project included a plan to  
368 undertake a substantive piece of research underpinned by the principles of  
369 action research methodology. However, the action research approach was no  
370 longer feasible amongst the prioritisation of key project activities and  
371 maintaining milestones. Through collaborative discussions with the  
372 partnership team, we could help identify a feasible study design and  
373 appropriate research questions alongside considerations of skills and  
374 knowledge inherent in the team for conducting the research. Although this  
375 was not assistance that could only be provided by behavioural scientists, the  
376 knowledge of mixed methods research and psychological theories  
377 underpinning mentoring, meant that the behavioural scientists could adapt to  
378 the local needs of the partnership, providing research support.

379 Our observations and initial reflections from the interviews indicated that the  
380 training workshops, coupled with the twinning and mentoring components of  
381 the project, appeared to be instrumental in strengthening both key mentoring  
382 skills and a sense of competency in using these skills in practice i.e.,  
383 capability. Our rapid review of the literature highlighted the importance of  
384 mentoring programmes in facilitating the self-efficacy of student midwives [25].  
385 Self-efficacy is a person's belief in their ability to do a particular task or  
386 succeed in a particular goal [26]. It was possible that an increase in the self-  
387 efficacy of mentors may have been an unanticipated outcome from this  
388 project and one that could warrant some further exploration. We therefore  
389 recommended a qualitative study exploring the impact of participating in the  
390 MOMENTUM project on mentors' and students' self-efficacy would be a  
391 valuable addition to the literature on midwifery mentoring in LMICs.  
392 Further email discussions and Skype calls with the health partnership in the  
393 period after our visit focused on agreeing roles and responsibilities, a plan for  
394 obtaining ethical approval, and the training needs of the UPMA team to collect  
395 the data. With the study design and skillset of the team in mind, we returned  
396 to Uganda to deliver a one week research skills training workshop.  
397 Workshops explored literature searches, conducting focus groups, self-  
398 efficacy, timelines and milestones. We worked collaboratively throughout,  
399 reviewing questions and approaches to data collection methodology (in this  
400 case focus groups) that were designed to be consistent with the literatures on  
401 self-efficacy and mentoring but also appropriate for Ugandan culture, for  
402 example, incorporating the use of images and analogies that we had  
403 previously observed to be very successful in crossing both professional and

404 cultural boundaries during the training sessions with midwives. Whilst there  
405 are no further visits planned, we continue to support our colleagues at the  
406 UPMA with aspects of data collection and analysis as well as their own  
407 professional development as researchers.

408 Our experiences of developing evaluations in our health partnership brought  
409 into sharp relief the cultural assumptions that bind many of our theories,  
410 constructs, measures and methods for data collection. It reminded us of the  
411 cultural differences that exist in the UK and why we should be cognisant of  
412 these when we undertake any research or discussions. The inclusion of  
413 behavioural scientists in this project had two interwoven outcomes. Firstly,  
414 the behavioural scientists, with their expertise in science methods and  
415 teaching and training, were able to build capacity locally in research  
416 knowledge and skills. Secondly, they were able to guide the generation of  
417 research questions such that the findings will build on what is already known  
418 about self-efficacy and mentoring. These two outcomes are beneficial to HP  
419 in empowering the LMIC partner to take a lead in the research around HP and  
420 also ensuring that the research asks questions that build on previous  
421 research.

422

## 423 Discussion

424 Our work with health partnerships has highlighted a need for more focus on  
425 the determinants of practice in the design and evaluation of partnership  
426 projects. We have found that this focus can be provided by volunteer  
427 behavioural scientists, working alongside and embedded within the  
428 partnerships. We have shown that small projects can be embedded within the

429 larger partnership that elucidate ways in which partnerships can be  
430 strengthened and sustained and that, in some cases, these small projects can  
431 themselves form research studies. Additionally, we have illustrated that  
432 partnership teams can benefit from capacity building exercises, making the  
433 use of behavioural theories and methods sustainable within the partnerships  
434 beyond the involvement of the behavioural scientists.

435 There are many ways in which this initial work could be taken forward. The  
436 Change Exchange was a pilot of a method of engaging behavioural scientists  
437 in volunteering activities and we certainly found that there were many  
438 volunteers who wanted the opportunity to contribute and learn within health  
439 partnerships. Moving from pilot to a routine part of health partnerships could  
440 have benefits for the content of training courses, and the knowledge and skills  
441 of behaviour change of both UK and local health care professionals, and the  
442 development of an evidence base. Firstly, reconceptualising training in terms  
443 of behaviours as opposed to knowledge and skills is crucial, particularly in  
444 understanding how the context in which a person works will inevitably impact  
445 on their activities. Secondly, systematically varying or adding behaviour  
446 change techniques within and across health partnerships could provide some  
447 evidence about how effective behaviour change interventions are in changing  
448 practice, and doing this within either a complex interventions [27] or natural  
449 experiment [28] framework would increase the robustness. Finally, assessing  
450 the theoretical determinants of change before training would mean that  
451 techniques could be selected to address the determinants shown to be a  
452 challenge. For example, behaviour change techniques designed to increase  
453 motivation would be ineffective if the healthcare professionals were already

454 motivated, but improved planning might be a useful alternative [29].

455 Assessing before and after means that educators can understand how the  
456 training is affecting the internal world of the trainee.

457 Limitations

458 The work was not without its challenges. The educators, although very  
459 receptive to behavioural approaches, already had full agendas for their  
460 education and training visits. This made it difficult to find time and space in  
461 training curricula to make changes. It would be beneficial, in future projects,  
462 for behavioural science to feature at the start and throughout the project. The  
463 projects move at a pace which was unfamiliar to the behavioural scientists,  
464 who were used to a slower pace in academic life. Further work will map the  
465 competencies required for this type of work against those developed through  
466 the training in behavioural science afforded by health psychology and other  
467 disciplines. In terms of sustainability and equity, we found it challenging to  
468 identify and collaborate with behavioural scientists based in the countries in  
469 which the projects were active. Building capacity and identifying potential  
470 behavioural science experts in each country of the partnerships would be  
471 beneficial in terms of both equity and sustainability of these types of activities.

472 Finally, the measures, methods and theories brought by the behavioural  
473 scientists have been developed largely through research with the so-called  
474 WEIRD (Western Educated Industrialised Rich and Democratic) population  
475 samples [30]. It is both a challenge and an opportunity to work within  
476 partnerships to test and advance the science of behaviour itself, resulting in a  
477 mutually beneficial collaborative effort. Our case studies show that health  
478 partnerships perceive a benefit of the inclusion of behavioural science and we

479 are able to conclude that using behavioural science in this way was feasible  
480 and acceptable. Further research in which behavioural science was robustly  
481 evaluated against other approaches would be required to make firm  
482 conclusions about the degree of added value.

483

#### 484 Conclusion

485 The Change Exchange is an example of how behavioural science can be  
486 translated *in situ* to support health partnership work. There are challenges to  
487 the translation of behavioural science into health partnerships in this manner  
488 including having time and space and the cultural appropriateness of theories  
489 and methods from high-income country science. Future work of The Change  
490 Exchange will tackle these issues and build partnerships with LMIC  
491 researchers with behavioural science expertise.

492

#### 493 List of abbreviations

494 CPD continuing professional development

495 BCT behaviour change technique

496 COM-B the Capability, Opportunity, Motivation, Behaviour Framework

497 RCOG the Royal College of Obstetricians and Gynaecologists

498 RCM the Royal College of Midwives

499 UPMA the Ugandan Private Midwives' Association

500 TDF the Theoretical Domains Framework

501 WEIRD western, educated, industrialised, rich and democratic

502

#### 503 Declarations

504 Ethics approval and consent to participate

505 Not applicable, we are not presenting any data.

506 Consent for publication

507 Not applicable, as no individual person's data is included.

508 Availability of data and material

509 Data sharing is not applicable to this article as no datasets were generated or

510 analysed for this paper.

511 Competing interests

512 Professor Ged Byrne is an employee of Health Education England (one of the

513 funders of the project) and is a trustee for the Tropical Health and Education

514 Trust (one of the funders of the project). The other authors declare no

515 competing interests.

516 Funding

517 The Change Exchange was jointly funded by the Tropical Health and

518 Education Trust and the Health Education England Global Health Exchange

519 from January 2016 to February 2017. Funders were not engaged in the

520 activities presented in this paper. One of the authors is employed by Health

521 Education England and is a trustee for the Tropical Health and Education

522 Trust.

523 Authors contributions

524 All authors made substantial contribution to conception, design and

525 interpretation of information in the paper. All authors were involved in drafting

526 the manuscript critically for important intellectual content. All authors have

527 given approval of the final version to be published and have participated

528 sufficiently in the work to take public responsibility for appropriate portions of

529 the content and have agreed to be accountable for all aspects of the work in  
530 ensuring that questions related to the accuracy or integrity of any part of the  
531 work are appropriately investigated and resolved. LBD and JH created the  
532 first draft of the background and conclusions of the paper. AB, FG & NS  
533 created the first draft of case study 1. LBD, JH CM & EB created the first draft  
534 of case study 2. WM and ND created the first draft of case study 3.

#### 535 Acknowledgements

536 The authors would like to thank all their colleagues in the health partnerships  
537 between RCOG and Kitovu, RCM and UPMA, PUPSMD and Masanga and  
538 Ipswich and Beira hospitals. This work would be meaningless and impossible  
539 without their collaborations. We would like to acknowledge the work of all the  
540 health professionals in the health facilities in which the health partnerships  
541 operate, we have learnt a great deal from them. We would also like to thank  
542 the behavioural scientists of the world, whose science we are translating.

543

#### 544 References

- 545 1. THET. THET Health Partnership Scheme Frequently Asked Questions.  
546 2017.
- 547 2. Miller GE. The assessment of clinical skills/competence/performance.  
548 Acad. Med. 1990;65:S63–7.
- 549 3. Vogel I. Review of the use of “Theory of Change” in international  
550 development [Internet]. London; 2012. Available from:  
551 [https://assets.publishing.service.gov.uk/media/57a08a5ded915d3cfd00071a/  
552 DFID\\_ToC\\_Review\\_VogelV7.pdf](https://assets.publishing.service.gov.uk/media/57a08a5ded915d3cfd00071a/DFID_ToC_Review_VogelV7.pdf)
- 553 4. Michie S, Abraham C. Interventions to change health behaviours: evidence-



554 based or evidence-inspired? 2012 [cited 2017 Feb 16]; Available from:  
555 <http://www.tandfonline.com/loi/gpsh20>

556 5. Bartholomew LK, Parcel GS, Kok G. Intervention Mapping: A Process for  
557 Developing Theory and Evidence-Based Health Education Programs. *Heal.*  
558 *Educ. Behav.* [Internet]. 1998 [cited 2017 Feb 16];25:545–63. Available from:  
559 <http://www.ncbi.nlm.nih.gov/pubmed/9768376>

560 6. Schaalma H, Kok G. Decoding health education interventions: the times are  
561 a-changin'. *Psychol. Health* [Internet]. 2009 [cited 2011 Mar 9];24:5–9.  
562 Available from: <http://www.ncbi.nlm.nih.gov/pubmed/20186636>

563 7. Eccles MP, Grimshaw JM, MacLennan G, Bonetti D, Glidewell L, Pitts NB,  
564 et al. Explaining clinical behaviors using multiple theoretical models.  
565 *Implement. Sci.* 2012. p. 99.

566 8. Pesseau J, Johnston M, Heponiemi T, Elovainio M, Francis JJ, Eccles MP,  
567 et al. Reflective and Automatic Processes in Health Care Professional  
568 Behaviour: a Dual Process Model Tested Across Multiple Behaviours. *Ann.*  
569 *Behav. Med.* 2014;347–58.

570 9. Michie S, Richardson M, Johnston M, Abraham C, Francis J, Hardeman W,  
571 et al. The behavior change technique taxonomy (v1) of 93 hierarchically  
572 clustered techniques: Building an international consensus for the reporting of  
573 behavior change interventions. *Ann. Behav. Med.* 2013;46:81–95.

574 10. Michie S, West R, Campbell R, Brown J, Gainforth H. ABC of behaviour  
575 change theories. Silverback Publishing; 2014.

576 11. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker a.  
577 Making psychological theory useful for implementing evidence based practice:  
578 a consensus approach. *Qual. Saf. Health Care* [Internet]. 2005 [cited 2011

579 Mar 7];14:26–33. Available from:  
580 <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1743963&tool=pmc>  
581 [entrez&rendertype=abstract](http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1743963&tool=pmc&rendertype=abstract)

582 12. Michie S, van Stralen MM, West R. The behaviour change wheel: A new  
583 method for characterising and designing behaviour change interventions.  
584 *Implement. Sci.* 2011;6:42.

585 13. Byrne-Davis LMT, Armitage CJ, Johnston M, Byrne GJ, Hart JK.  
586 Manchester Implementation Science Collaboration [Internet]. 2017. Available  
587 from: [www.mcrimpsci.org](http://www.mcrimpsci.org)

588 14. Hart J, Byrne-Davis L, Armitage C, Johnston M, Slattery H, Jackson M, et  
589 al. IMPLEMENTING EVIDENCE-BASED CARE IN LOW  
590 INCOMECOUNTRIES: ACCEPTABILITY AND IMPACT OF A  
591 UGANDAN TRAINING COURSE. *Int. J. Behav. Med.* 21 (Suppl 1) S1-S216  
592 [Internet]. Springer; 2014. p. S155. Available from:  
593 [http://download.springer.com/static/pdf/148/art%253A10.1007%252Fs12529-](http://download.springer.com/static/pdf/148/art%253A10.1007%252Fs12529-014-9418-2.pdf?auth66=1408004078_dd0f65fb953b526ee50ed2305b91103d&ext=.pdf)  
594 [014-9418-](http://download.springer.com/static/pdf/148/art%253A10.1007%252Fs12529-014-9418-2.pdf?auth66=1408004078_dd0f65fb953b526ee50ed2305b91103d&ext=.pdf)  
595 [2.pdf?auth66=1408004078\\_dd0f65fb953b526ee50ed2305b91103d&ext=.pdf](http://download.springer.com/static/pdf/148/art%253A10.1007%252Fs12529-014-9418-2.pdf?auth66=1408004078_dd0f65fb953b526ee50ed2305b91103d&ext=.pdf)

596 15. Byrne-Davis LM, Byrne GJ, Jackson MJ, Abio A, McCarthy R, Slattery H,  
597 et al. Understanding implementation of maternal acute illness management  
598 education by measuring capability, opportunity and motivation: A mixed  
599 methods study in a low-income country. *J. Nurs. Educ. Pract.* [Internet]. 2015  
600 [cited 2015 Nov 25];6:p59. Available from:  
601 <http://www.sciencedirect.com/journal/index.php/jnep/article/view/8061>

602 16. Byrne-Davis L, Slattery H, Whiteside S, Moro E, Jackson M, Onyachi N, et  
603 al. Efficacy and acceptability of an acute illness management course delivered

604 to staff and students in Uganda by staff from the UK. *Int. Health* [Internet].  
605 2014 [cited 2015 May 21];ihu078-. Available from:  
606 <http://inthehealth.oxfordjournals.org/content/early/2014/11/15/inthehealth.ihu078.ab>  
607 stract

608 17. McCarthy R, Byrne-Davis L, Hart J, Yuill G, Slattery H, Jackson M, et al. A  
609 feasible, acceptable and effective way to teach healthcare workers in low- and  
610 middle-income countries A method to manage acutely ill obstetric women.  
611 *Midwifery* [Internet]. 2014 [cited 2014 May 14]; Available from:  
612 <http://www.sciencedirect.com/science/article/pii/S0266613814001193>

613 18. Ryan RM, Deci EL. Self-Determination Theory and the Facilitation of  
614 Intrinsic Motivation, Social Development, and Well-Being.

615 19. Mahmood A, Chaudhury H, Valente M. Nurses' perceptions of how  
616 physical environment affects medication errors in acute care settings. *Appl.*  
617 *Nurs. Res.* [Internet]. 2011 [cited 2017 May 9];24:229–37. Available from:  
618 <http://www.ncbi.nlm.nih.gov/pubmed/22099470>

619 20. Hallsworth M, Snijders V, Burd H, Prestt J, Judah G, Huf S, et al. Applying  
620 behavioural insights: Simple ways to improve health outcomes [Internet].  
621 Doha; 2016. Available from: [www.wish.org.qa](http://www.wish.org.qa)

622 21. Picone DM, Titler MG, Dochterman J, Shever L, Kim T, Abramowitz P, et  
623 al. Predictors of Medication Errors Among Elderly Hospitalized Patients. *Am.*  
624 *J. Med. Qual.* [Internet]. 2008 [cited 2017 May 9];23:115–27. Available from:  
625 <http://www.ncbi.nlm.nih.gov/pubmed/18305099>

626 22. Royal College of Midwives. Supporting midwifery beyond our borders:  
627 Global midwifery twinning project. London; 2015.

628 23. Michie S, Johnston M, Abraham C, Lawton R, Parker D, Walker A, et al.

629 Making psychological theory useful for implementing evidence based practice:  
630 a consensus approach. Qual. Saf. Health Care [Internet]. BMJ Group; 2005  
631 [cited 2017 Feb 16];14:26–33. Available from:  
632 <http://www.ncbi.nlm.nih.gov/pubmed/15692000>  
633 24. Huijg JM, Gebhardt WA, Crone MR, Dusseldorp E, Pesseau J.  
634 Discriminant content validity of a theoretical domains framework questionnaire  
635 for use in implementation research. Implement. Sci. [Internet]. 2014;9:11.  
636 Available from: <http://www.implementationscience.com/content/9/1/11>  
637 25. Lauder W, Holland K, Roxburgh M, Topping K, Watson R, Johnson M, et  
638 al. Measuring competence, self-reported competence and self-efficacy in pre-  
639 registration students. Nurs. Stand. [Internet]. 2008 [cited 2017 Feb 16];22:35–  
640 43. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/18284020>  
641 26. Bandura A. Self-efficacy: The exercise of control. New York: Freeman;  
642 1997.  
643 27. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, Petticrew M.  
644 Developing and evaluating complex interventions: the new Medical Research  
645 Council guidance. BMJ. 2008;337.  
646 28. Craig P, Cooper C, Gunnell D, Haw S, Lawson K, Macintyre S, et al.  
647 Using natural experiments to evaluate population health interventions:  
648 guidance for producers and users of evidence. [cited 2017 Feb 16]; Available  
649 from: [www.mrc.ac.uk/naturalexperimentsguidance](http://www.mrc.ac.uk/naturalexperimentsguidance)  
650 29. Pesseau J, Hawthorne G, Sniehotta FF, Steen N, Francis JJ, Johnston  
651 M, et al. Improving Diabetes care through Examining, Advising, and  
652 prescribing (IDEA): protocol for a theory-based cluster randomised controlled  
653 trial of a multiple behaviour change intervention aimed at primary healthcare

654 professionals. Implement. Sci. [Internet]. 2014;9:61. Available from:  
655 <http://www.implementationscience.com/content/9/1/61>  
656 30. Henrich J, Heine S, Norenzayan A. The weirdest people in the world.  
657 Behav. Brain Sci. 2010;33:61–135.  
658