

1 How behavioural science can contribute to health partnerships: the case of
2 The Change Exchange
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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

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511 Competing interests

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

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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.

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543

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