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Understanding success and limiting factors in health service innovation: an empirically derived model

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Abstract

Objectives To illuminate the factors that are associated with innovation success in healthcare settings.

Design Exploratory analysis of a mixed methods survey that invited innovators to rate and describe the salience of factors identified from the literature in relation to their innovation's success, supplemented by interviews.

Setting The research explored innovations supported by one of the UK's Academic Health Science Networks which provides small grants, awards and structural support to health service innovators including academics, health and social care professionals, and third sector organisations.

Participants All 176 recipients of funding or support 2014-18 were invited to participate.

Results Responses were received relating to 56 projects, which were used to generate a model that conceptualises success along two axes: value creation ('did it work?') and diffusion ('did it embed or spread?'). An analysis of variance between categories of success indicated thirteen critical success factors relating to value generation; eleven relating to expansion of a valuable project; and five that were critical to both value creation and project expansion. Success factors were categorised into themes relating to expertise, leadership, organisational fit, structural support, societal alignment and participation. Additional limiting factors derived from qualitative responses included difficulties navigating the boundaries and intersections between organisations, professions, sectors and cultures; a lack of support for innovation beyond the start-up phase; a lack of protected time; and staff burnout and churn.

Conclusions A model has been derived via an analysis of these factors, providing targeted suggestions to enhance the success of future innovations.

Article summary

Strengths and limitations

- A strength of this research is that it compares a large number of innovations in a consistent way, and that it provides insights across a range of categories of success.
- A limitation of this research is that it is situated in a single healthcare context; however, repeating these methods in different contexts should produce locally relevant results.
- Few mid-level theories relating to innovation are grounded in data that include projects that have not achieved their intended outcomes; therefore, we may have identified novel limiting factors.
- Many of the success factors we have identified are not unique to this study; however, they have been subjected to further statistical analysis and were found to be significant in this context.
- More research is needed to examine whether addressing these factors prospectively enhances the success of future innovations.

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Background

Healthcare systems worldwide are faced with increasing demand linked to the rising burden of disease within a resource-constrained environment [1]. This has led to a pressing need to find and disseminate innovative ways of meeting the healthcare needs of patients and communities in ways that are more sustainable [2].The World Health Organisation characterises health service innovation as "a novel set of behaviours, routines, and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost-effectiveness, or users' experience and that are implemented by planned and coordinated actions" [3] (p7).

Academic efforts in the health sciences continue to sharpen the focus on impact, rather than the creation of 'new knowledge' as the primary goal of research activity. At the vanguard are those who work to translate research and innovation into clinical practice, navigating institutional, organisational, structural and cultural complexities to improve services [4]. New support structures have emerged, such as the fifteen Academic Health Science Networks set up in the UK in 2013 by NHS England, with funding streams that aim to support and encourage innovation at various levels [5]. After more than half a decade of programme grants, the impact of these innovation programmes is a legitimate subject of enquiry: how and why have certain innovations become normalised, sustained or spread, and why have others struggled or not been integrated into the NHS?

The knowledge created from and through a single innovation is complex and context-dependent, providing insights that, while transferrable, may not necessarily be predictive of outcomes. Shifting the unit of analysis away from examining individually-reported project outcomes, which are necessarily heterogenous, towards examining a larger corpus of projects, may offer insights into the factors that differentiate between successful and unsuccessful innovations. This study thus sets out to explore a large number of innovations, both as individual projects in their unique local contexts, and as part of a larger programme of activity.

The published literature on healthcare innovation contains few analyses of unsuccessful innovations, despite attempts to encourage negative reporting [6]. By evaluating a large set of funded projects, we have a unique opportunity to examine those that were successful and compare them with struggling or less successful innovations.

Our research aim is therefore to explore what experienced innovators, as key informants, feel has impacted on the success of their innovation; and from this, to produce an empirically-derived explanatory model. By isolating the factors that differentiate between categories of success, our aim is to inform and enhance the success of future innovations.

Methods

Methodology and theoretical framing

This study is situated at the intersection of policy, social sciences, and organisational research. Our philosophical assumptions are that there are real differences in the success of innovations, but also that success is fundamentally a subjective construct. Any research will only produce an approximation of the truth, and findings must be interpreted with an appreciation for context. We therefore position this research at the boundary of critical realism and constructivism [7] and have adopted a mixed methods design [8]. We have used quantitative methods to explore the salience of potential success factors, and qualitative methods to validate, expand and illuminate those factors.

Context

The Health Innovation Network (HIN) is one of the nationally-funded Academic Health Science Networks set up by NHS England in 2013. It provides small grants, awards and structural support to academics, health and social care professionals and third-sector organisations, supporting service-level innovations to improve outcomes and value, including the sustainable use of resources. All recipients of HIN funding and support during 2014-2018 were invited to participate.

Research team and ethics

The research was commissioned by HIN in collaboration with Health Education England and conducted by an independent research team at King's College London. The research team comprised a postdoctoral educational psychologist/learning scientist (GR), a postdoctoral occupational psychologist/health services researcher (AK), and a medical education research fellow (KLG). None were in a position of power or influence over participants, and the research was carefully designed to be conducted at arm's length from the funding agency. Responses were anonymised and decontextualised by the research team to encourage innovators to comment critically and safely about their own projects.

The research team sought ethical approval from the Research Ethics Committee of Kings College London (LRS-18/19-10432).

Patient and public involvement

There was no patient involvement. The subjects of this research were health service innovators who were involved in the survey design and in checking back our interpretation.

Data generation

The research process (summarised in Figure 1) began with a simultaneous nested design [8] survey based on success factors for healthcare innovations identified through a systematic review of the literature [9]. We conducted five scoping interviews to validate the content and scope of the survey and improve the clarity and usability of the questions and instructions. This identified one further theme that had not appeared in the systematic review (personal factors), with six related sub-factors.

Figure 1: Research overview

The survey (summarised in Figure 2, full text in supplementary data) asked respondents to:

a) Describe and categorise their project's current status.
b) Score statements relating to the impacts of 56 factors on their project, grouped into nine themes on a five-point Likert scale.
c) Provide qualitative insights into each of the nine themes.

We conducted five follow-up interviews with survey participants to cross-check emergent findings and to explore contextual factors in greater depth.

Figure 2: Survey scope

Survey distribution

We distributed the survey by email in August and September 2019 to all 176 named recipients of HIN funding awards, grants and bursaries. A reminder was distributed four weeks later to non-responders. Projects that had received more than one award were sent a single survey, and participants who had run more than one project were sent a separate survey for each project.

Results and analysis

We received 63 responses, but seven were incomplete or duplicate so a total of 56 responses (31.8% of 176) were included in the analysis. Survey respondents self-identified within one or more of the following groups: the project leadership team (n=54); service delivery team (n=9); training team (n=9); administrative team (n=6); service lead (n=2); and patient/service user (n=1). Several respondents identified within multiple groups.

Projects were situated in secondary care (n=19); community care (n=14); academic sector (n=5); mental health sector (n=4); online (n=4); primary care (n=3); and the hospice sector (n=2), with the remainder working at the interfaces between services, or across sectors.

The innovation projects related to new ways of working in areas including: end-of-life care; disability enablement; support for complex or vulnerable patients; discharge support; pain management; recovery and rehabilitation; chronic conditions; new models of integrated health and social care; health promotion; and novel simulation and workforce development strategies.

Development of categories of success

We categorised projects into grades of success based on how the respondent self-categorised their project, triangulated against the rest of their survey responses. The final categories of success were derived through an iterative process, involving two researchers agreeing a descriptive summary of the status of each project, grouping similar projects together, and constructing an emergent framework that accounted for all the cases in the set.

The final framework scored projects on two axes, the first relating to whether the innovation was reported as realising its intended value ('did it work?'); the second according to whether it was extended in time or place ('did it embed/spread?'). The framework used for categorisations is illustrated in Figure 3, with the number of innovations in each category shown in brackets.

Figure 3: Framework for categorisation of success within health service innovation

Success factor analysis

We adopted an exploratory approach to data analysis, which aims to generate rather than test theory [10]. We conducted an analysis of variance for each of the 56 scored factors (Kruskal-Wallis non-parametric one-way ANOVA using IBM© SPSS© v25) to see whether there were significant differences between categories of success across the horizontal 'value creation' axis and the vertical 'expansion' axis. First, we compared innovations that had demonstrated lower than expected value (n=11), value as expected (n=25), and higher than expected value (n=20). Next, we compared innovations that had diminished in scope or stopped (n=17), innovations that were running as expected (n=16), and innovations that had become extended in time or place (n=23). Finally, we excluded low-value projects and analysed again across the expansion axis (n=10, n=12, and n=23, respectively), seeking to explore why innovations with proven value had failed to embed and spread.

For each factor that was identified as being significantly different between categories of success, we conducted a post hoc analysis to confirm the direction and consistency of the association. A graded

'exposure-response' relationship across all three categories of success would be expected if a factor genuinely drives success [11]. Where a graded relationship was not present, this is discussed in Table 1.

Our quantitative analysis is presented in Table 1 with significant results ($p<0.05$) shaded in green. At this level of significance, there is a 1 in 20 probability that a result is in fact random. We have used lighter shading to indicate a slightly nuanced grading of significance around this figure, to indicate which factors might potentially be significant, or which could be found not to be significant if the power of the study was increased. The final column gives our interpretation of the more significant findings ($p<0.05$) that takes into consideration our post hoc analysis.

Many factors have been found to be similarly scored across all categories of success. This does not mean that these factors are not important, only that they do not differentiate between categories of success and are therefore unlikely to be the underlying cause of the relative success or failure of a project.

Table 1: Analysis of variance of potential success factors across categories of success

Our analysis of variance between categories of success indicated thirteen critical success factors relating to value generation; eleven relating to expansion of a valuable project; and five that were critical to both value creation and project expansion. We have grouped these into themes relating to expertise, leadership, organisational fit, structural support, societal alignment and participation which we discuss below, illuminated by quotes. Survey respondents are indicated by R(n) and follow-up interview respondents by FI(n).

Project-related factors

Interestingly, none of the project-related factors turned out to be critical to success. Both successful and unsuccessful innovations were similarly designed to address an important healthcare need that was concerning to the public. All funded projects were required to articulate a credible evidence base arguing that stated benefits could be achieved through the project plan.

Resourcing and expertise

Primary resource-related success factors were associated with the workforce. Non-critical factors included infrastructure (such as buildings, materials and supplies), which were reported as sufficient; information technology support, which was moderately good across all categories of success; and funding issues, which were also similar across all categories of success. However, having the right numbers of staff with the right skill mix was a highly significant factor, both in terms of the project being able to realise its intended value, as well as for it to become embedded or spread. Time and energy were critical to whether successful innovations became embedded or spread, as were

administrative and educational support, including the availability of ongoing development support (e.g. orientation and training for new staff, or to build capacity). Expertise was critical across all categories of success, both in terms of the innovator feeling they had the right skills, experience or training; the project having access to staff with the right skills; and having external expert input where needed.

> "As the project was run within [*university*] and [*tertiary hospital trust*], there was plenty of expertise to call upon as required." R6

> "The programme support sat with one individual rather than a team and as highlighted previously the administrative/programme support hadn't been entirely appreciated/factored in at the outset of the programme." R16

External factors

External factors appeared to correlate with whether a project was able to realise its intended value, but less so with its expansion. However, as the effect size didn't grow consistently across categories of value creation, we cannot infer a causal relationship [11]. Qualitative comments indicated that projects that were able to align themselves to current political or societal agendas, such as mental health, were more successful. Conversely, those attempting to work in relatively less topical areas of practice, such as audiology, described difficulty securing strategic funding.

> "The project piggy-backed on the current social movement highlighting the needs of mental health." R18

> "Hearing has always been the poor relation to other health issues even though everyone knows someone struggles with their hearing either family or friends." R35

Organisational factors

Our analysis of organisational factors indicated that the ability of an innovation to integrate into existing organisational structures, programmes or policies was critical to whether it became embedded or spread, and possibly also to its ability to create value (p=0.059). Successful projects showed evidence of adapting where necessary to achieve a good fit within organisational priorities. For the most part, host organisations were described as having a positive learning culture and were ready and able to undertake innovative initiatives, however even innovations with proven value were unable to survive if there was opposition within the host organisation.

> "There was also a disconnect between commissioner priorities & [*the host organisation's*] priorities in relation to the programme, which impacted on its sustainability & roll-out." R16

Personal factors

Few respondents reported being released from other duties so that they could implement their initiative. However, most respondents said they benefited from a supportive peer culture.

Respondents who were able to realise value were significantly more like to say they were internally motivated, had ownership of and commitment to their project, and found success rewarding.

> "I was very motivated to implement this project which was demanding as I had no protected time for it. Nonetheless, you do what is needed to achieve a goal." R18

> "I am very proud of our achievements and that the work has become a routine part of our culture and system of working" R28

Project management

Most projects measured or assessed the outcomes and impacts of the project, though this appeared to be more common in successful projects (p=0.060). Projects with high value were able to demonstrate and share this success.

> "The ongoing reporting allowed for the results to be understood early in the project, shared and used in the strategy for delivering education across South West London" R5

> "A robust evaluation was undertaken of the programme, along with regular review points to inform adaptations/opportunities for improvement." R16

Leadership appeared to be a highly significant success factor across all categories of success, with struggling or unsuccessful projects citing leadership failures.

> "Leadership hasn't been invested in providing the platform for the workshops & curriculum to be rolled out. Lip service given by leadership." R56

Participation

Distributed decision making was a critical success factor across all definitions of success and was present in *all* projects that were embedded or spread. Participatory approaches were significantly associated the ability of an innovation to generate value. These participatory processes related to the staff delivering the innovation, the intended beneficiaries, and the communities in which the innovations were situated.

> "We always express the value of our service users, administrator, and other members of the team and meet regularly to discuss well-being, progress, and evaluation." R33

> "We had members across all organisations attend and participate which ultimately lead to sustainability and better relationships being formed." R17

> "We've had some sort of service user involvement all the way through... that's really improved the way we've reflected and talked… it gives a genuineness to what we're trying to achieve… the fact that you go and work with the associates and carers, you actually go and look at the environment, you spend time with the nurses that you're going to be teaching and all the other people that you're working with, really helps to, you know, it definitely adds value to the project." FI3

Supportive network

Finally, one of the most significant differentiating factors across all categories of success was the presence of a collaborative network of people/organisations that helped to support and sustain the initiative.

> "There was a single practitioner using the resource on her own, and now it is nationally recognised… Without that level of support: the time, the people and the resources, we wouldn't have got anywhere. It's been a fantastic level of support. They designed an implementation toolkit to support practitioners embedding the programme locally." FI2

> "The continued support has enabled the project to continue. There is growing national interest." R48

> "The team at the Health Innovation Network were fabulous and so supportive." R12

> "There are innovators out there who are doing things on their own, and the person I'm thinking about is not in a very good place. He's got virtually no support, and I don't know how he does it." FI2

Limiting factor analysis

In addition to the above success factors, the following limiting factors were identified through our qualitative analysis of failed or struggling projects. These included difficulties navigating the boundaries and intersections between organisations, professions, sectors and cultures; a lack of support for innovation beyond the start-up phase; a lack of protected time; and staff burnout and churn.

Boundaries between commercial, voluntary and public sectors

While UK healthcare is primarily publicly funded and provided by the National Health Service (NHS), social care is often commercially provided [12], creating the potential for friction at the interfaces between these sectors.

> *"As the care homes are private businesses, there was some lack of political will to embrace the training, as there was a view that although there was the potential to improve health outcomes for the residents, the manager did not feel there were sufficient resources to implement the required training"* R4

Commercial organisations were reported as unwilling to release staff for training, unless the value of that training was felt within the organisation. Valuable initiatives by the voluntary sector to train social care staff, but which provided benefits in the healthcare sector, fell between sectors and were potentially unviable without direct funding.

> *"The voluntary sector is happy to participate but there is no spare capacity within it unless there is a financial package that can go with it."* R35

There was concern that privately-funded organisations were not subject to the same standards and mandates as the publicly funded bodies, and were failing to invest in training.

> *"Because it is not mandated, organisations do not have to engage with or release staff for education."* R2

Restructuring within the NHS has created a set of semi-autonomous institutions and organisations with different and sometimes competing priorities [13]. Some participants described difficulty aligning project aims to multiple organisational goals.

> *"There were tensions between the two boroughs in relation to approach & resourcing. There was also a tension between commissioner expectations and practice/federation expectations which have impacted on the programmes sustainability."* R16

> *"So, this intervention has a good return on investment, for every £1 you spend you get a return of £5.20. And they'll say, I'm the one making the investment, but he's the one making the return here. I've got a budget; he's got another budget. We might both be in the health system, but I'm not going to spend my money if he's the one getting the return."* FI2

Workplace cultures and priorities

Some projects reported finding non-healthcare workers receptive to health-related training, however some failed or struggling projects found this a challenge.

> *"medicines delivery teams unwilling to take on additional role"* R61

> *"There were concerns raised by care home managers that the initiative would cause undue responsibility on individuals to make clinical decisions."* R16

Participants described differences between academic and workplace learning cultures, and variable receptiveness of front-line clinical staff to change. Some described resistance to outsiders telling healthcare workers how to improve. This may reflect the inverse of high value projects, which were found to engage in participatory practices, engaging patients, front-line staff and communities in co-designing their innovation.

> *"It has been difficult to embed these products due to structural issues within the staff teams. (Nursing) It was clearly not seen as a priority."* R20

> *"I think the main insight I would have is that when working with mental health nursing teams the researcher and research team needs to be fully integrated into team(s) and seen as part of the culture. Being an outsider does not seem to work as day to day practice seems to regulate research."* R20

Participants also described tensions between management priorities and the priorities of those working directly with patients.

> *"No interest on part of management. I don't think they have even read it."* R57

> *"The initiative was welcomed at service level, however there was little interest at senior management level."* R52

> "There is such a dislocation between commissioning and what is happening on the ground." FI2

Lack of support beyond the start-up phase

Participants noted ongoing privileging of new innovation over sustaining, embedding, or helping spread innovations that have already demonstrated their value. For example, clinical academics do not gain publications for ongoing maintenance of innovative practice:

> *"research remit probably wouldn't cover [further dissemination] unless there was a good likelihood of REFability"* ["REF" refers to the Research Excellence Framework, a scoring system used to fund the university sector] R1

Participants described innovation funding streams, but articulated difficulty securing funding beyond the start-up phase.

> *"The project was resourced sufficiently for the pilot. However, once the pilot finished so did the project."* R5

> *"the education faculty and funding is driven towards innovation and not sustainability - this de-incentives individuals from continuing with existing projects"* R8

Burnout, turnover and lack of protected time

Participants described projects that were limited by staff burnout, turnover, and a lack of protected time.

> *"My commitment to the project was there however the resources I had to continue with project were limited due to competing pressures on my time."* R12

> *"The programme required more administrative support than anticipated & this ended up being an ask over & above someone's day job for a prolonged period of time"* R16

> "*the most important person was our pharmacist who moved from the pharmacy a few months after we started!"* R61

Risk as integral to innovation

Finally, it is worth noting that participants felt that risk was a necessary ingredient of healthcare innovation and should also be rewarded. Innovations that fail to demonstrate value should be supported in folding without hesitation, and lessons shared.

> *"The project demonstrated that this initiative was not a model that would work in the hospital environment hence could not be embedded"* R30

Discussion

We have proposed a model for understanding success in health service innovation that has two discrete axes: one relating to whether or not the innovation created value; the other relating to whether it was extended in time or place. We identified 56 potential success factors from the literature and interviews, and distributed a survey exploring these factors to 176 innovators. An exploratory analysis of 56 responses has enabled us to determine which factors were significantly associated with success across both axes. Additional limiting factors were determined through an inductive qualitative analysis of responses and through follow-up interviews. We have arranged these factors into themes to create a nested hierarchy illustrated in figure 4.

Figure 4: Nested hierarchy of success factors and limiting factors for health service innovation

Within healthcare services, the issue of diffusion and sustainability of innovation has received widespread academic attention pioneered by Greenhalgh et al. (2004) who drew on Rogers' seminal text on Diffusion of Innovations (1962). There have been many subsequent notable academic contributions [14-18]. Nilsen (2015) proposed an overarching framework of healthcare implementation theories according to the aim of the theory [19]. Theories such as those about innovation sustainability, which include the Diffusion of Innovation theory, were categorised as "determinant frameworks", as they posit general types of factors that can influence the success of an innovation. We believe that our findings contribute through empirical evidence to theoretical development at this level, and thus may have predictive implications. Davidoff et al. (2015) describes Grand, Mid-Range and Programme Theories [20]. Grand Theories are formulated at a high level of abstraction and make generalisations that apply across many different domains. Mid-Range Theories (e.g. Diffusion of Innovation) are posited at an intermediate-level as frameworks for understanding a problem that may guide the development of specific interventions. Programme theories are specific to individual interventions and are concrete explanatory models rather than abstractions. Applying Davidoff and colleagues' formulation, our findings and model share characteristics of both programme theories and mid-range theories. There are few programme-level studies that have mid-range theoretical

implications. Often, research that attempts to create a "determinant framework" or a "mid-range theory" are relatively abstract and are removed from the original data. According to Nilsen, such theories have typically been analysed and formulated across individual studies, at the level of meta-analysis or review [19]. The present study is different in that we have developed mid-range theory that is empirically grounded in programme-level data, based on a corpus of projects; further, this work demonstrates a clear line from programme-level data to the generated theory.

In their conceptual model of healthcare innovation, Greenhalgh et al. emphasise diffusion as a measure of an innovation success. However, our findings indicate that successful innovations may have a natural boundary, perhaps because their aims have been achieved, or because the context changes. Our model therefore positions healthcare innovations along two axes of success: value creation on one axis (‘did it work?’), and diffusion on the other (‘did it embed/spread?’). The neutral mid-points of "value as expected" and "running as expected" allow us to conceptualise a valuable innovation that is not growing or expanding but has also not diminished in scale or been terminated. This, we argue, is important: healthcare innovations may often have strict parameters within which growth and expansion are constrained. An innovation that has met its aims but has not expanded beyond its natural boundary should be properly positioned as such.

Conclusions

We suggest that organisations and policy makers wishing to support service-level innovation in similar healthcare contexts are more likely to generate value if they address the factors identified through this research as critical to success.

Such strategies include:

- supporting innovators with the right skills and expertise, including leadership, implementation and evaluation expertise
- innovation networks to provide opportunities to showcase success and provide a community of learning and support
- facilitation of participatory practices and collaborative approaches, so that innovations are more likely to align to societal and organisation goals, and generate value for patients, communities and practitioners
- providing dedicated administrative and educational support so that innovators have sufficient time, expertise and energy for the roll-out phase
- strategies that recognise and enhance the internal motivation and drive of innovators, such as providing protected time and support beyond the start-up phase.

At a structural level, the boundaries between organisations, professions, and the health and social care sectors need to be addressed as potential barriers to successful innovation.

More research is needed to confirm whether addressing these factors prospectively enhances the success of future innovations.

Contributorship statement

KLG and GR contributed to the conception and design of the work and to the acquisition of data. KLG, GR and AK collaborated on the data analysis and interpretation. KLG and AK drafted the work, all authors revised it critically for important intellectual content. All authors have approved the final version and agree to be accountable for all aspects of the work and to resolve questions relating to accuracy or integrity.

Competing interests

There are no competing interests.

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Data sharing statement

Due the highly individual nature of healthcare innovations and the limited geographic area of this study, we are unable to provide our raw data. We undertake to provide a redacted data set upon reasonable request.

Supplementary data

Full text survey

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Figure legends

Figure 1: Research overview

Legend: Understanding significant success factors and limiting factors in health service innovation: a mixed-methods research process involving an exploratory survey with explanatory nested comments and follow-up interviews.

Figure 2: Survey scope

Legend: The survey scope was based on a systematic review of the literature (Lennox et al, 2018) supplemented by five scoping interviews. The full questions are listed in table 1, and the full text survey is in the supplementary material.

Figure 3: Framework for categorisation of success within health service innovation

Legend: Health service innovations were categorised across two dimensions of success through an inductive classification process. The horizontal axis relates to how successful innovations were in realising their intended value: "did it work?" The vertical axis relates to the diffusion or extension of the innovation: "did it embed/spread?" Numbers in brackets indicate how many innovations were found in each category.

Figure 4: Nested hierarchy of success factors and limiting factors for health service innovation

Legend: Factors that are significant to both value generation *and* to whether the innovation becomes embedded or spread are labelled as fundamental needs. Factors significant to value generation are the next priority (middle layer) as innovations that do not generate value will not become embedded or spread. Finally, factors that are only significant to whether an innovation becomes embedded or spread are presented in the innermost layer. Additional limiting factors were identified through an inductive analysis of qualitative responses.

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Table 1: Analysis of variance of potential success factors across categories of success

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
1	The initiative was designed to end once a set outcome had been achieved	↘ -0.40	0.274	0.172	0.317	
2	The initiative was designed to end after defined period of time	↘ -0.58	0.011	0.011	0.288	Unsurprisingly, even projects with high realised value finish if they are time-bound
3	The initiative was designed to address an important healthcare need	↑ 1.63	0.765	0.712	0.135	
4	There was public/political recognition and concern for the problem that the initiative was designed to address	↑ 1.23	0.939	0.66	0.201	
5	The initiative was based on a strong evidence base, and it was credible that the stated benefits could be achieved through the project plan	↑ 1.35	0.696	0.355	0.299	
6	The project was sufficiently funded	↗ 1.17	0.941	0.454	0.126	
7	The project had sufficient infrastructure, such as buildings, office space, materials or supplies	↑ 1.52	0.952	0.842	0.613	
8	There were sufficient members of staff with the right skills to meet the requirements of the initiative	↑ 1.42	0.003	0.002	0.013	Skilled workforce is a critical success factor across all definitions of success
9	Members of staff had sufficient energy and time to dedicate to the initiative	↑ 1.21	0.033	0.085	0.362	Time and energy are critical to whether proven innovations expand
10	There was sufficient administrative support to deliver and maintain the initiative	↗ 0.85	0.013	0.019	0.142	Administrative support is critical to whether an innovation expands
11	There was sufficient technical support to deliver and maintain the initiative	↗ 1.04	0.113	0.187	0.657	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
12	There was sufficient educational support to deliver and maintain the initiative	↑ 1.30	0.023	0.012	0.089	Educational support is critical to whether an innovation expands
13	External political or societal factors impacted negatively on the delivery of the initiative	↘ -0.91	0.191	0.141	0.005	External political or societal factors appear critical to whether an innovation is able to realise its intended value (inconsistent exposure/response)
14	It was necessary to adapt the project so that it aligned more closely with external political or societal priorities	↘ -0.72	0.541	0.252	0.064	
15	We had opportunities to demonstrate the benefits of this innovation within our organisation and/or to other organisations	↑ 1.59	0.237	0.053	0.02	Unsurprisingly innovations that were able to realise their intended value, were more likely to be able to demonstrate the benefits of their innovation
16	Steps were taken to raise the profile of the initiative e.g. through media, marketing, community engagement or publications	↗ 0.85	0.108	0.059	0.306	
17	There are plans to replicate this innovation at other sites or spread it to other parts of the organisation	↗ 0.58	0.024	0.012	0.228	Unsurprisingly, innovations that have become embedded and spread were more likely to say there were plans to spread their innovation
18	The initiative integrated well into existing organisational structures, programmes or policies	↑ 1.26	0.012	0.002	0.059	The ability of an innovation to integrate into existing organisational structures is critical to whether it becomes embedded or spread
19	It was necessary to adapt the initiative so that it achieved a good fit with existing organisational structures, programmes or policies	→ -0.09	0.053	0.035	0.115	For innovations to extend/embed, including those that are less successful, they must adapt so that they fit within existing organisational structures.
20	The host organisation was ready and able to undertake the initiative	↑ 1.55	0.262	0.168	0.721	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
21	The initiative was hampered by opposition from within the host organisation	↓ -1.50	0.037	0.027	0.398	However valuable an innovation is, it will not survive if it is opposed within the host organisation.
22	The host organisation lacked the necessary values/culture to support and sustain the initiative	↓ -1.17	0.265	0.247	0.888	
23	I was released from other duties so that I could implement this initiative	↘ -0.43	0.732	0.893	0.789	
24	I had a supportive peer network that I could discuss any issues or problems with	↑ 1.32	0.385	0.562	0.79	
25	I was internally motivated to implement this initiative	↑ 1.81	0.425	0.129	0.034	Innovations are more likely to realise their value if the innovator is internally motivated
26	I found working on the initiative personally rewarding	↑ 1.81	0.147	0.067	0.022	Unsurprisingly, there is a correlation between an innovation realising its value, and the innovator finding it rewarding.
27	I feel I had the right skills/experience/training to implement and sustain the initiative	↑ 1.62	0.033	0.008	0.023	The skills of the innovator are a critical success factor across all definitions of success.
28	I had sufficient energy and time to dedicate to the initiative	↗ 1.06	0.209	0.268	0.498	
29	The project had sufficient input from experts with the necessary knowledge and experience	↑ 1.66	0.134	0.018	0.021	Expert input is critical to both realisation of value, and to whether it expands.
30	The outcomes and impact of the project were measured or assessed	↑ 1.37	0.060	0.125	0.119	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
31	We were able to demonstrate the effectiveness of the project	↑ 1.38	0.463	0.185	0.015	Unsurprisingly innovations that were able to realise their intended value, were more likely to be able to demonstrate the effectiveness of their innovation.
32	Performance data was gathered and reported on a regular basis	↗ 1.04	0.346	0.266	0.159	
33	Steps were taken to systematically improve and adapt the project	↑ 1.44	0.293	0.153	0.377	
34	There was ongoing orientation and training available e.g. to new staff or to build capacity	↗ 0.87	0.034	0.03	0.153	The availability of ongoing training is critical to whether successful innovations become embedded or spread.
35	Staff were given time/incentives to attend the necessary training	→ 0.47	0.096	0.159	0.178	
36	Staff were required to attend the necessary training	→ 0.11	0.348	0.271	0.767	
37	The initiative was difficult or complex to deliver	→ -0.09	0.294	0.163	0.158	
38	The initiative helped to make things easier or more efficient	↗ 0.76	0.86	0.953	0.182	
39	The initiative did not require special or extra effort	↓ -1.09	0.979	0.869	0.597	
40	I believe that the staff delivering the initiative found the work/tasks rewarding and satisfying	↑ 1.59	0.368	0.456	0.743	
41	The project team worked well together	↑ 1.74	0.416	0.796	0.893	
42	There were clear responsibilities for individuals the work was shared across the team	↑ 1.45	0.945	0.533	0.066	
43	Project was overly dependent on a particular individual or individuals	↗ 0.57	0.708	0.355	0.29	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
44	I believe that the team understood what the project was trying to achieve and that it would lead to improved processes and outcomes	↑ 1.62	0.218	0.165	0.772	
45	There were rewards or incentives that supported engagement with, and continued delivery of, the initiative	→ 0.07	0.45	0.638	0.228	
46	The activities and roles of the initiative were incorporated into job descriptions	↘ -0.30	0.29	0.243	0.141	
47	Staff had time within their working hours to complete the tasks of the initiative	↗ 0.59	0.251	0.138	0.328	
48	The initiative had leadership and/or champions who were committed and capable	↑ 1.62	0.003	0.001	0.006	Leadership is a highly significant critical success factor across all definitions of success.
49	There was an appropriate balance of power between those involved with the initiative	↗ 1.15	0.697	0.775	0.929	
50	Team members were able to express their opinions, and their opinions were valued	↑ 1.91	1 (no valriance)	0.049	0.026	Distributed decision making was a critical success factor across all definitions of success, and common to all embedded/ spread innovations of value (hence no variance)
51	There was a sense of ownership and commitment by those involved with the initiative	↑ 1.79	0.284	0.177	0.102	
52	Staff who were responsible for delivering the initiative were involved as partners, and were able to shape the initiative	↑ 1.74	0.306	0.176	0.031	Participatory processes with staff were critical to the ability of a project to realise its intended value.

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
53	The beneficiaries (patients/service users) were involved as partners, and were able to shape the initiative	↗ 0.83	0.45	0.139	0.027	Participatory processes with patients/service users were critical to the ability of a project to realise its intended value.
54	The community in which it was situated were involved as partners, and were able to shape the initiative	↗ 0.96	0.177	0.034	0.023	Participatory processes on a community level were critical to both the ability of a project to realise its value, and its ability to become embedded / spread.
55	There was a collaborative network of people/organisations that helped to support and sustain the initiative	↑ 1.30	0.008	0.007	0.003	The support of a collaborative network of people/organisation is a highly significant critical success factor across all definitions of success.
56	It felt as though the initiative was imposed on us and there was little sense of ownership or commitment to the project	↓ -1.64	0.684	0.488	0.326	

Foot note to table 1: Analysis of variance of potential success factors across categories of success

* Respondents on average ↑= agree, ↗=somewhat agree, →=neither agree not disagree, ↘= somewhat disagree, ↓=disagree

** Asymptotic significances are displayed. The significance level is 0.05.
The darker the shading, the safer it is to reject the null hypothesis. Sig <0.05 indicates >95% certainty that the difference between categories is not random.

*** Secondary analysis examined the direction of the association and the strength of effect across categories of success.

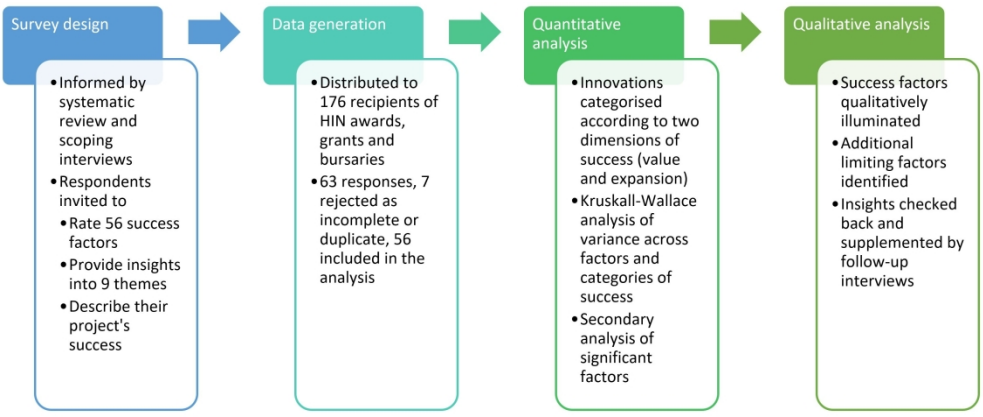

Figure 1: Research overview / Understanding significant success factors and limiting factors in health service innovation: a mixed-methods research process involving an exploratory survey with explanatory nested comments and follow-up interviews.

580x240mm (144 x 144 DPI)

Figure 2: Survey scope / The survey scope was based on a systematic review of the literature (Lennox et al, 2018) supplemented by five scoping interviews. The questions are listed in table 1, and the full text survey is in the supplementary material.

332x329mm (144 x 144 DPI)

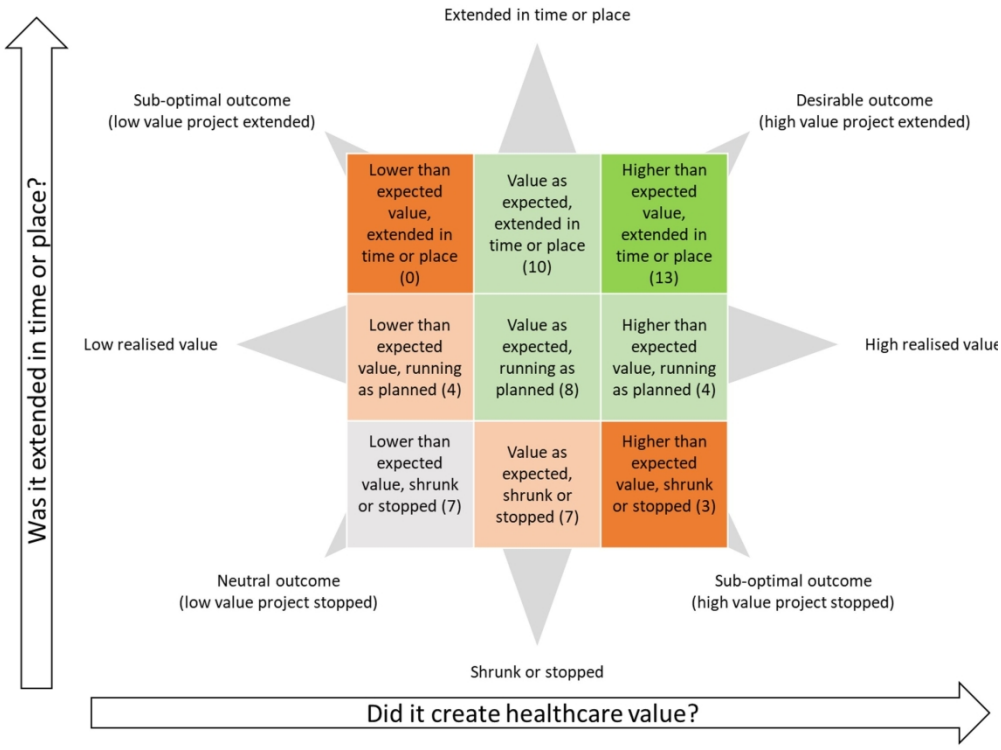

Figure 3: Framework for categorisation of success within health service innovation / Health service innovations were categorised across two dimensions of success through an inductive classification process. The horizontal axis relates to how successful innovations were in realising their intended value: "did it work?" The vertical axis relates to the diffusion or extension of the innovation: "did it embed/spread?" Numbers in brackets indicate how many innovations were found in each category.

445x331mm (144 x 144 DPI)

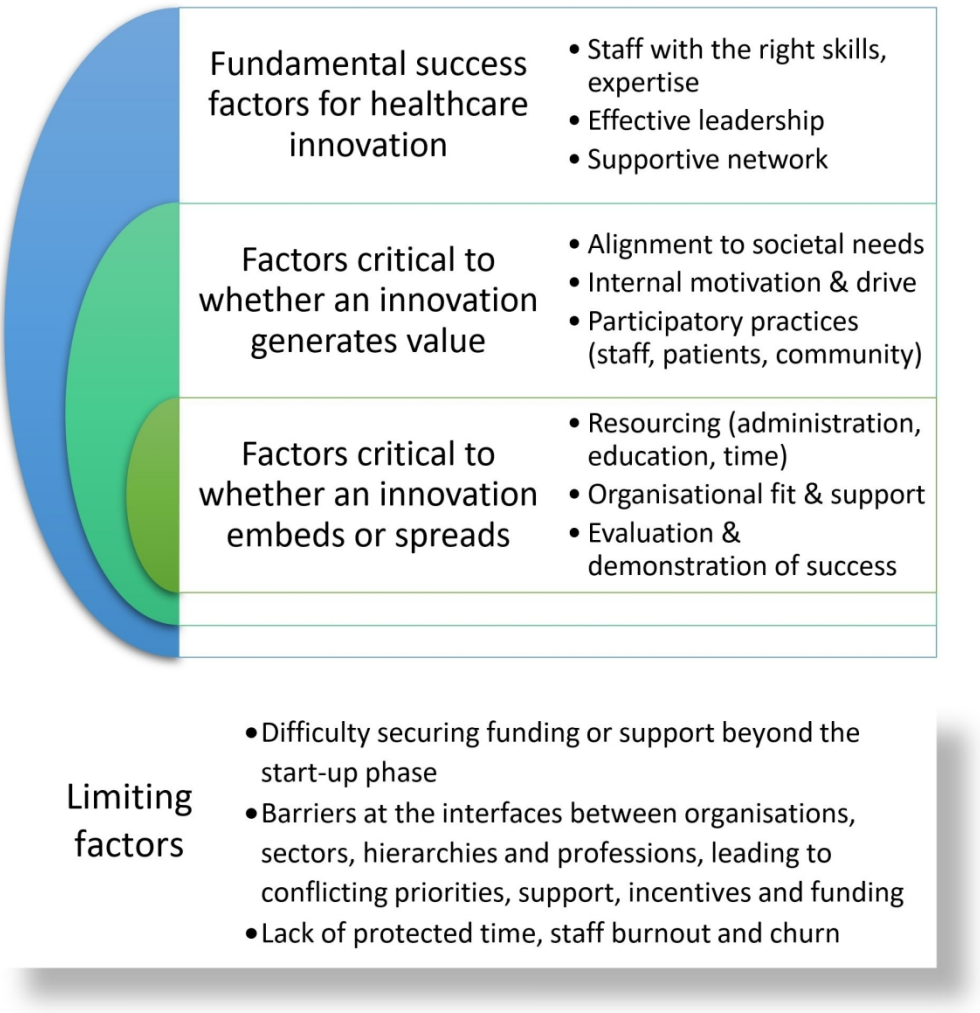

Figure 4: Nested hierarchy of success factors and limiting factors for health service innovation / Factors that are significant to both value generation and to whether the innovation becomes embedded or spread are labelled as fundamental needs. Factors significant to value generation are the next priority (middle layer) as innovations that do not generate value will not become embedded or spread. Finally, factors that are only significant to whether an innovation becomes embedded or spread are presented in the innermost layer. Additional limiting factors were identified through an inductive analysis of qualitative responses.

332x337mm (144 x 144 DPI)

Sustaining and embedding healthcare innovations - HIN evaluation - post scoping

Start of Block: Opening block

Q1

Sustaining and embedding healthcare innovations: an evaluation for the Health Innovation Network and Health Education England

This questionnaire is being conducted by King's College London on behalf of Health Education England and the Health Innovation Network (HIN). The questionnaire aims to explore factors influencing the long term success of healthcare innovations. You will be asked to rate a set of factors that have been identified from the current literature and evidence.

Each rating should represent your overall impression of whether the factor has influenced the project named below. Please use the free text boxes to help us understand any factors that you feel are particularly important.

How will my responses be used?

HIN would like to support healthcare innovators so that their projects are more likely to become sustained and embedded. Aggregated responses will be used by HIN to target training and development, and to disseminate learning about factors that impact on the sustainability of healthcare innovations. You will not be identified as a respondent.

Why have I been approached?

You are the named recipient of ${e://Field/Award} from the Health Innovation Network of South London. This project has been approved by King's College Research Ethics Committee Ref: LRS-18/19-10432.

Which project does this survey relate to?

${e://Field/ProjectTitle}

Q3 Please tell us about the above named project (select one)

- ○ It is no longer running (you can tell us why later) (1)
- ○ It is running, but likely to finish soon (2)
- ○ It is running in a stable way but has NOT been adopted beyond its original pilot (3)
- ○ It is running in a stable way and HAS been adopted beyond its original pilot (4)
- ○ It is too early to have a view on its long term status (5)
- ○ Other (7) _____

Q4 Tell us about yourself (tick ALL that apply)

- ☐ I am part of the project leadership team (1)
- ☐ I am part of the project administrative team (2)
- ☐ I am part of the project training team (3)
- ☐ I am a healthcare/socialcare professional delivering this project to patients/service users (4)
- ☐ I am a patient/service user (5)
- ☐ Other (please describe) (6) _____

End of Block: Opening block

Start of Block: The Project

Q18 **Factors relating to the type of project, and what it was trying to achieve.**

Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q66 The initiative was designed to end once a set outcome had been achieved.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q67 The initiative was designed to end after defined period of time.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q68 The initiative was designed to address an important healthcare need.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q69 There was public/political recognition and concern for the problem that the initiative was designed to address.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q72 The initiative was based on a strong evidence base, and it was credible that the stated benefits could be achieved through the project plan.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q79 Insights or details relating to the type of project or what it was trying to achieve, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The Project

Start of Block: Resources

Q26 **Factors relating to how well the project was resourced.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q65 The project was sufficiently funded.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q36 The project had sufficient infrastructure, such as buildings, office space, materials or supplies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q37 There were sufficient members of staff with the right skills to meet the requirements of the initiative.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q38 Members of staff had sufficient energy and time to dedicate to the initiative.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q35 There was sufficient administrative support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q39 There was sufficient technical support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q40 There was sufficient educational support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q87 Insights or details relating to how well the project was resourced, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Resources

Start of Block: External environment

Q47 **Factors relating to how the project intersected with the external environment.** Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q41 External political or societal factors impacted negatively on the delivery of the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q42 It was necessary to adapt the project so that it aligned more closely with external political or societal priorities.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q43 We had opportunities to demonstrate the benefits of this innovation within our organisation and/or to other organisations.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q44 Steps were taken to raise the profile of the initiative e.g. through media, marketing, community engagement or publications.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q45 There are plans to replicate this innovation at other sites or spread it to other parts of the organisation.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q92 Insights or details relating to how the project intersected with the external environment, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: External environment

Start of Block: The organisation

Q49 **Factors relating to the host organisation within which this initiative was situated.** Your comments will not be fed directly back to the host organisation, however they may be used to identify a training need. Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

We believe the host organisation for this innovation to be:
${e://Field/Organisation}

If you are referring to another organisation (e.g. CCG, Hospital Trust) please name it here:

_____

Q48 The initiative integrated well into existing organisational structures, programmes or policies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q50 It was necessary to adapt the initiative so that it achieved a good fit with existing organisational structures, programmes or policies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q51 The host organisation was ready and able to undertake the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q52 The initiative was hampered by opposition from within the host organisation.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q53 The host organisation lacked the necessary values/culture to support and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q97 Insights or details relating to the host organisation within which this initiative was situated, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The organisation

Start of Block: Personal factors

Q148 **Factors relating to yourself.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important. We respect your privacy: individual responses will not be linked to you or your project. Please skip any questions you do not feel comfortable answering.

Q150 I was released from other duties so that I could implement this initative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q151 I had a supportive peer network that I could discuss any issues or problems with.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q152 I was internally motivated to implement this initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q78 I found working on the initiative personally rewarding.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q153 I feel I had the right skills/experience/training to implement and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q149 I had sufficient energy and time to dedicate to the initative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q154 Insights or details relating to yourself, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Personal factors

Start of Block: Implementation

Q55 **Factors relating to how the project was implemented.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q54 The project had sufficient input from experts with the necessary knowledge and experience.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q56 The outcomes and impact of the project were measured or assessed.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q57 We were able to demonstrate the effectiveness of the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q58 Performance data was gathered and reported on a regular basis.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q59 Steps were taken to systematically improve and adapt the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q60 There was ongoing orientation and training available e.g. to new staff or to build capacity.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q61 Staff were given time/incentives to attend the necessary training.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q62 Staff were required to attend the necessary training.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q105 Insights or details relating to how the project was implemented, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Implementation

Start of Block: The work/tasks

Q64 **Factors relating to the tasks of the project.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q63 The initiative was difficult or complex to deliver.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q65 The initiative helped to make things easier or more efficient.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q66 The initiative did not require special or extra effort.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q67 I believe that the staff delivering the initiative found the work/tasks rewarding and satisfying.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q109 Insights or details relating to the tasks of the project, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The work/tasks

Start of Block: Team processes

Q68 **Factors relating to team processes.**
Your answers will not be fed back directly to the team, however they may be used to identify training needs across the network. Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q69 The project team worked well together.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q70 There were clear responsibilities for individuals: the work was shared across the team.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q71 Project was overly dependent on a particular individual or individuals.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q72 I believe that the team understood what the project was trying to achieve and that it would lead to improved processes and outcomes.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q73 There were rewards or incentives that supported engagement with, and continued delivery of, the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q74 The activities and roles of the initiative were incorporated into job descriptions.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q75 Staff had time within their working hours to complete the tasks of the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q76 The initiative had leadership and/or champions who were committed and capable.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q77 There was an appropriate balance of power between those involved with the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q78 Team members were able to express their opinions, and their opinions were valued.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q119 Insights or details relating to team dynamics and processes, and how these impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Team processes

Start of Block: Participation

Q79 **Factors relating to ownership and involvement in the project.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q80 There was a sense of ownership and commitment by those involved with the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q81 Staff who were responsible for delivering the initiative were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q82 The beneficiaries (patients/service users) were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q83 The community in which it was situated were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q84 There was a collaborative network of people/organisations that helped to support and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q85 It felt as though the initiative was imposed on us and there was little sense of ownership or commitment to the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q125 Insights or details relating to ownership or involvement in the project, and how these impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Participation

Start of Block: End of survey

Thank you for taking part in this survey. If you have any questions please contact the lead researcher kathleen.leedham-green@kcl.ac.uk.

End of Block: End of survey

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Success and limiting factors in health service innovation: a theory generating mixed-methods evaluation of UK projects

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Success and limiting factors in health service innovation: a theory generating mixed-methods evaluation of UK projects

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Abstract

Objectives To explore and explain success and limiting factors in UK health service innovation.

Design Mixed methods evaluation of a series of health service innovations involving a survey and interviews, with theory-generating analysis.

Setting The research explored innovations supported by one of the UK's Academic Health Science Networks which provides small grants, awards and structural support to health service innovators including clinical academics, health and social care professionals, and third sector organisations.

Participants All recipients of funding or support 2014-18 were invited to participate. We analysed survey responses relating to 56 innovation projects.

Results Responses were used to conceptualise success along two axes: value creation for the intended beneficiaries and expansion beyond its original pilot. An analysis of variance between categories of success indicated that participation, motivation and evaluation were critical to value generation; organisational, educational and administrative support were critical to expansion; and leadership and collaborative expertise were critical to both value creation and expansion. Additional limiting factors derived from qualitative responses included difficulties navigating the boundaries and intersections between organisations, professions, sectors and cultures; a lack of support for innovation beyond the start-up phase; a lack of protected time; and staff burnout and turnover.

Conclusions A nested hierarchy of innovation needs has been derived via an analysis of these factors, providing targeted suggestions to enhance the success of future innovations.

Article summary

Strengths and limitations

- A strength of this research is that it compares many innovations in a consistent way, and that it provides insights across a range of categories of success.
- A limitation of this research is that it is situated in a single geographical context; however, repeating these methods in different contexts should produce locally relevant results.
- Few mid-level theories relating to innovation are grounded in data that include projects that have not achieved their intended outcomes; therefore, we may have identified novel insights.
- Many of the success factors we have identified are not unique to this study; however, they have been subjected to further statistical analysis and found to differentiate significantly across categories of success in this context.
- More research is needed to examine whether addressing these factors prospectively enhances the success of future innovations.

Success and limiting factors in health service innovation: a theory generating mixed-methods evaluation of UK projects

Background

Healthcare systems worldwide are faced with increasing demand linked to the rising burden of disease within a resource-constrained environment [1]. This has led to a pressing need to find and disseminate innovative ways of meeting the healthcare needs of patients and communities in ways that are more sustainable [2].The World Health Organisation characterises health service innovation as "a novel set of behaviours, routines, and ways of working that are discontinuous with previous practice, are directed at improving health outcomes, administrative efficiency, cost-effectiveness, or users' experience and that are implemented by planned and coordinated actions" [3] (p7).

Academic efforts in the health sciences continue to sharpen the focus on impact, rather than the creation of 'new knowledge' as the primary goal of research activity. At the vanguard are implementation scientists who work to translate research and innovation into clinical practice, navigating institutional, organisational, structural and cultural complexities to improve services [4]. New support structures have emerged, such as the fifteen Academic Health Science Networks set up in 2013 by NHS England, with funding streams that aim to support and encourage innovation at various levels [5]. After more than half a decade of programme grants, the impact of these innovation programmes is a legitimate subject of enquiry: how and why have certain innovations become normalised, sustained or spread, and why have others struggled or stopped?

The knowledge created through an individual innovation is likely to be complex and context-dependent, providing insights that may not necessarily be generalisable [6]. Meta-analyses are faced with the complexity of synthesising multiple project evaluations that may be reported in different ways. The published literature on health service innovation contains few analyses of unsuccessful innovations, despite attempts to encourage negative reporting [7]. By evaluating a large corpus of projects across one of these academic health sciences networks in a systematic way, we have an opportunity to directly compare innovations including those that may have struggled or stopped and not reached the literature.

This study thus sets out to explore a large number of innovations, both as individual projects in their unique local contexts, and as part of a larger integrative study. By isolating the factors that differentiate between categories of success, our aim is to produce an empirically-derived explanatory model, and thereby to inform and enhance the success of future innovations.

Methods

Research aim

To explore and explain success and limiting factors in health service innovation.

Methodological orientation and theory

This study is situated at the intersection of policy, social sciences, and organisational research. Our philosophical assumptions are that there are real differences in the success of innovations, but also that success is fundamentally a subjective construct. Any research will only produce an approximation of the truth, and findings must be interpreted with an appreciation for context. We therefore position this research at the boundary of critical realism and constructivism [8].

Adopting Varpio's terminology on the philosophy of research, we are taking an inductive approach that works towards a theoretical framework, rather than applying a pre-existing theoretical framework to this study [9].

We have adopted what Creswell refers to as a sequential mixed-methods design [10]. According to Creswell, insight can emerge from exploring first through qualitative methods (in our case a published qualitative review and interviews) the types of factors that might be important, and then designing questionnaires to explore their salience to a population (called an 'exploratory sequential design'). Insight can also emerge from collecting survey data initially and then following up with interviews to help explain the survey results in more detail: an 'explanatory sequential design'. Where both qualitative and quantitative data are collected simultaneously, one set of data can be used to triangulate the other (for example, where the meaning of one is unclear), or they can be used in complementary ways to illuminate each other (for example, one determining which factors are important, the other illuminating why that might be). Our research process involves both exploratory and explanatory aspects as well as triangulation and illumination. It is summarised in Figure 1.

Context

The Health Innovation Network (HIN) is one of the nationally-funded Academic Health Science Networks set up by NHS England in 2013. It provides small grants, awards and structural support to academics, health and social care professionals and third-sector organisations, supporting service-level innovations to improve outcomes and value, including the sustainable use of resources. In addition, in the years 2014-2017, Health Education England (South London) provided investment in training and education innovation projects across healthcare settings in south London, through its strategic investment programme.

Participants and sampling

All recipients of HIN funding and Health Education England (South London) strategic investment programme funding and support during the years 2014-2018 were invited to participate. As our sample size was moderate, we aimed to analyse all responses and retrospectively determine whether the sample size was sufficient for thematic saturation and statistical inference. We achieved *a priori* thematic saturation for success factors (exemplar comments for each significant factor that we found) and inductive thematic saturation for limiting factors (content coded until no new themes arose) [11].

Research team and ethics

The research was commissioned by HIN in collaboration with Health Education England and conducted by an independent research team at King's College London. The research team comprised a postdoctoral educational psychologist/learning scientist (GR), a postdoctoral occupational psychologist/health services researcher (AK), and a medical education research fellow (KLG). None were in a position of power or influence over participants, and the research was carefully designed to be conducted at arm's length from the funding agency. Survey responses were collected anonymously and decontextualised by the research team to encourage innovators to comment critically and safely about their projects. HIN funding was not conditional on taking part in this research. Ethical approval was granted on 26-Mar-2019 by the Research Ethics Committee of Kings College London (LRS-18/19-10432). Written informed consent was obtained from interviewees. Consent was implied from participation in the survey.

Patient and public involvement

No patient involved. The primary stakeholders in this research were health service innovators who were involved in the survey design and in checking back and refining our interpretation.

Data generation methods

Figure 1: Research overview

Survey design

The survey design began with the extraction of potential success factors for health service innovation from a recently published qualitative systematic review [12]. This review aimed to identify all the factors and theories associated with sustainability and scale-up (capacity building) of innovations in health services research. KLG validated and expanded these factors through scoping interviews with five experienced health service innovators. The interviews started with an open exploration of what the innovator felt had impacted on the success of their project, followed by

discussion on the factors identified through the literature. Personal factors were mentioned by all stakeholders in addition to the factors from the review, suggesting these may be under-reported. An additional theme (personal factors) with related sub-factors was therefore included, based on these interviews. Themes and factors are listed in Figure 2. These were used to create a mixed methods nested design survey [13] using Qualtrics software (full text in supplementary data).

The survey asked respondents to:

a) Categorise and describe their project's current status (no longer running / likely to finish soon / stable at the level of the original pilot / scaled-up beyond the original pilot / too early to say / other)
b) Score statements (listed in table 1) relating to the impacts of each factor on their project's outcomes, grouped into nine themes on a five-point disagree/agree Likert scale.
c) Describe the status of their project and provide qualitative insights into each of the nine themes.

Our five stakeholders helped to improve the clarity, acceptability and usability of the survey questions and instructions.

Figure 2: Survey scope

Survey distribution

A neutral administrator from Health Education England distributed the survey by email in August and September 2019 to all 176 named recipients of HIN funding awards, grants and bursaries. A reminder was distributed four weeks later to participants who had not responded. Projects that had received more than one award were sent a single survey, and participants who had run more than one project were sent a separate survey for each project.

Stakeholder follow-up interviews

KLG checked back our results and interpretation with five stakeholders identified by HIN as experienced innovators, one of whom was also involved in the original scoping interviews. Interviews lasted 30 - 45 minutes and transcription was facilitated by automated software (otter.ai). These stakeholders helped to refine the model and confirmed its the applicability and utility in their context. No new themes arose, however quotes were used to enrich our survey data.

Data analysis methods

Development of categories of success

KLG and AK categorised projects into grades of success based on how the respondent self-categorised their project, triangulated against their qualitative survey responses. The categories of

success were derived through an iterative process, involving both researchers agreeing a descriptive summary of the status of each project (e.g. scaled down despite achieving better than expected patient outcomes; scaled down because the intervention didn't achieve its aims). We grouped projects with similar project outcomes together, and through a process of constant comparison [14] constructed a categorisation framework that accounted for all the cases in the set.

Determination of salience of success factors

We adopted an exploratory approach to data analysis, which aims to generate rather than test theory [15]. KLG conducted an analysis of variance for each of the scored factors (Kruskal-Wallis non-parametric ANOVA on rank using IBM© SPSS© v25) to see whether there were significant differences between categories of success. The Kruskal-Wallis test does not assume a normal distribution in the data and can be used when the data is ordinal e.g. Likert scores. For asymmetric group sizes, the non-parametric Kruskal-Wallis test performs better than the parametric equivalent ANOVA method [16].

For each factor that was identified as being significantly different between categories of success, we conducted a secondary analysis (box plot for each category) to confirm the direction and consistency of the association. This is generated automatically by SPSS after a Kruskal-Wallis test. A graded 'exposure-response' relationship across all grades of success would be expected if a factor genuinely drives success [17]. Where a graded relationship was not present, this is discussed in Table 1.

Illumination of success factors

KLG and AK extracted quotes from the survey and interviews relating to each significant success factor to generate a rich description within each theme.

Inductive analysis of limiting factors

KLG coded the content of all qualitative data relating to challenges within projects that had not achieved their intended outcomes or that had scaled-down or stopped (n=21) facilitated by NVivo 12 software. GR and KLG refined the codes and both authors worked together to inductively arrange the content into themes [18].

Development of final model

We mapped significant factors onto a 2x2 grid using a natural logarithmic scatter plot so that factors that were significant to one dimension of success were mapped to the right half of the grid, factors that were significant to a second dimension of success were mapped to the top half, and factors that were significant to both were mapped to the top right quadrant. We grouped success factors into themes through a process of collaborative discussion, and we explored which themes predominated in each quadrant to generate our model which was checked back with stakeholders.

Results

Descriptive summary

We received 63 responses, but seven were incomplete or duplicate so a total of 56 responses (31.8% of 176) were included in the analysis. Each response related to a different innovation project. Survey respondents self-identified within one or more of the following groups: the project leadership team (n=54); service delivery team (n=9); training team (n=9); administrative team (n=6); service lead (n=2); and patient/service user (n=1). Several respondents identified within multiple groups.

Projects were situated in secondary care (n=19); community care (n=14); academic sector (n=5); mental health sector (n=4); online (n=4); primary care (n=3); and the hospice sector (n=2), with the remainder working at the interfaces between services, or across sectors. Their scope ranged from national programmes at hundreds of sites, local programmes supporting tens of thousands of patients, to small intensive innovations working in new ways with a few dozen complex patients, and their duration ranged from 1-5 years. The innovation areas related to new ways of working in end-of-life care; disability enablement; support for complex or vulnerable patients; discharge support; pain management; patient safety innovations; recovery and rehabilitation; personalised care; chronic conditions; new models of integrated health and social care; health promotion; and novel simulation and workforce development strategies. Projects can be explored at the HIN website [19], however for reasons of confidentiality, we cannot specify which were included in this study.

Categories of success

Our emergent framework categorised each project's success across two dimensions: the first relating to whether the innovation was reported as generating more or less than its anticipated value for patients/carers ('value creation axis'), the second according to whether the project became sustained or scaled up beyond the initial pilot, or whether it was scaled down or stopped ('expansion axis'). Innovations that were within the scope and intentions of the original pilot were positioned centrally. We initially scored projects into five categorisations across the expansion axis, as some projects expanded locally and some nationally, however there were not enough projects in each group and statistics became unreliable, so we made a pragmatic decision to adopt relative rather than absolute categories.

The resulting categorical framework is illustrated in Figure 3, with the number of innovations in each category shown in brackets.

Figure 3: Framework for categorisation of success within health service innovation

Success factors

Our analysis of variance compared innovations that had demonstrated lower than expected value (n=11), value as expected (n=25), and higher than expected value (n=20). Next, we compared innovations that had diminished in scope or stopped (n=17), innovations that were running as expected (n=16), and innovations that had scaled up (n=23). Finally, we excluded low-value projects and analysed again across the expansion axis (n=10, n=12, and n=23, respectively), seeking to explore why innovations with proven value had not been scaled up.

Our analysis is presented in Table 1 with significant results ($p<0.05$) in bold and shaded. At this level of significance, there is a 1 in 20 probability that a result is in fact random. We have used lighter shading to indicate factors that might potentially be significant, or which could be found not to be significant if the power of the study was increased. The final column gives our interpretation of the more significant findings ($p<0.05$) that takes into consideration our secondary analysis.

Many factors were similarly scored across all categories of success, for example IT infrastructure. This does not mean that these factors are not important, only that they were experienced similarly across all categories of success and are therefore unlikely to be the underlying cause of the relative success or failure of a project.

Table 1: Analysis of variance of potential success factors across categories of success

We have collated the significant factors together in Table 2 with illuminative quotes, and we discuss both positive and negative findings within each of the nine survey themes below.

Project-related factors

Interestingly, the aims of the project did not appear to be critical to success. Both successful and unsuccessful innovations were similarly reported as being designed to address an important healthcare need that was concerning to the public. All funded projects were required to articulate a credible evidence base arguing that stated benefits could be achieved through the project plan.

Resourcing and expertise

All significant resource-related success factors were associated with the workforce. Non-critical factors included infrastructure (such as buildings, materials and supplies), which were reported as sufficient; information technology, which was moderately good across all categories of success; and funding issues, which were also similar across all categories of success. However, having the right numbers of staff with the right skills appeared to be highly significant, both in terms of the project being able to realise its intended value, as well as for it to become scaled up beyond the original

pilot. Staff with time and energy appeared critical to whether successful innovations became scaled up, as were administrative and educational support, including the availability of ongoing educational support (e.g. orientation and training for new staff, or to build capacity). Expertise appeared to be critical across all categories of success, both in terms of the innovator feeling they had the right skills, experience or training; the project having access to staff with the right skills; and having external expert input where needed.

External factors

Alignment to societal needs appeared to correlate with whether a project was able to realise its intended value, but less so with its expansion. However, as the effect size didn't grow consistently across categories of value creation, we cannot necessarily infer a causal relationship [17]. Qualitative comments indicated that projects that were able to align themselves to current political or societal agendas, such as mental health, were more successful. Conversely, those attempting to work in relatively less topical areas of practice described difficulty securing strategic funding, so we have tentatively included this factor in our model.

Organisational factors

Our analysis of organisational factors indicated that the ability of an innovation to integrate into existing organisational structures, programmes or policies may be critical to whether it scales up, and possibly also to its ability to create value (p=0.059). Successful projects described adapting where necessary to achieve a good fit within organisational priorities. For the most part, host organisations were described as having a positive learning culture and were ready and able to undertake innovative initiatives, however even innovations with proven value were unable to survive if there was opposition within the host organisation.

Personal factors

Few respondents reported being released from other duties so that they could implement their initiative. However, most respondents said they benefited from a supportive peer culture. Respondents who were able to realise value were significantly more like to say they were internally motivated and found working on the project rewarding.

Project management

Most projects measured or assessed the outcomes and impacts of the project, though this appeared to be more common in successful projects (p=0.060). Projects with high value were able to demonstrate and share this success. Leadership appeared to be a highly significant success factor across all categories of success, with struggling or unsuccessful projects citing leadership failures.

The tasks of the project

Similarly to theme 2, which explored the aims of the project, the tasks of the project did not appear to be significantly different across categories of success.

Collaborative and participatory practices

Valuing team members' opinions was highly significant across all categories of success and was present in *all* projects that were scaled up (hence variance not calculable). Participatory approaches were significantly associated with the ability of an innovation to generate value. These participatory processes related to the staff delivering the innovation, the intended beneficiaries, and the communities in which the innovations were situated.

Finally, one of the most significant differentiating factors across all categories of success was engagement with a collaborative network that helped to support and sustain the initiative.

Limiting factor analysis

In addition to the above success factors, which were quantitatively identified, the following limiting factors were identified through our qualitative analysis of failed or struggling projects. As our limiting factor analysis is qualitative and interpretive, we present our data in line with our analysis.

Boundaries between commercial, voluntary and public sectors

While UK healthcare is primarily publicly funded and provided by the National Health Service (NHS), social care is often commercially provided [20], creating the potential for friction at the interfaces between these sectors.

> *"As the care homes are private businesses, there was some lack of political will to embrace the training, as there was a view that although there was the potential to improve health outcomes for the residents, the manager did not feel there were sufficient resources to implement the required training"* R4

Commercial organisations were reported as unwilling to release staff for training unless the value of that training was felt within the organisation. Valuable initiatives by the voluntary sector to train social care staff, but which provided benefits in the healthcare sector, fell between sectors and were potentially unviable without direct funding.

> *"The voluntary sector is happy to participate but there is no spare capacity within it unless there is a financial package that can go with it."* R35

There was concern that privately-funded organisations were not subject to the same standards and mandates as the publicly funded bodies, and were failing to invest in training.

> *"Because it is not mandated, organisations do not have to engage with or release staff for education."* R2

Restructuring within the NHS has created a set of semi-autonomous institutions and organisations with different and sometimes competing priorities [21]. Some participants described difficulty aligning project aims to multiple organisational goals.

> *"There were tensions between the two boroughs in relation to approach & resourcing. There was also a tension between commissioner expectations and practice/federation expectations which have impacted on the programmes sustainability."* R16

> *"So, this intervention has a good return on investment, for every £1 you spend you get a return of £5.20. And they'll say, I'm the one making the investment, but he's the one making the return here. I've got a budget; he's got another budget. We might both be in the health system, but I'm not going to spend my money if he's the one getting the return."* FI2

Workplace cultures and priorities

Some projects reported finding non-healthcare workers receptive to health-related training, however some failed or struggling projects found this a challenge.

> *"medicines delivery teams unwilling to take on additional role"* R61
> *"There were concerns raised by care home managers that the initiative would cause undue responsibility on individuals to make clinical decisions."* R16

Participants described differences between academic and workplace learning cultures, and variable receptiveness of front-line clinical staff to change. Some described resistance to outsiders telling healthcare workers how to improve. This may reflect the inverse of high value projects, which were found to engage in participatory practices, engaging patients, front-line staff and communities in co-designing their innovation.

> *"It has been difficult to embed these products due to structural issues within the staff teams. (Nursing) It was clearly not seen as a priority."* R20

> *"I think the main insight I would have is that when working with mental health nursing teams the researcher and research team needs to be fully integrated into team(s) and seen as part of the culture. Being an outsider does not seem to work as day-to-day practice seems to regulate research."* R20

Participants also described tensions between management priorities and the priorities of those working directly with patients.

"No interest on part of management. I don't think they have even read it." R57

"The initiative was welcomed at service level, however there was little interest at senior management level." R52

"*There is such a dislocation between commissioning and what is happening on the ground."* FI2

Lack of support beyond the start-up phase

Participants noted ongoing privileging of new innovation over sustaining or scaling up innovations that have already demonstrated their value. For example, clinical academics do not gain publications for ongoing maintenance of innovative practice:

"research remit probably wouldn't cover [further dissemination] unless there was a good likelihood of REFability" ["REF" refers to the Research Excellence Framework, a scoring system used to fund the university sector] R1

Participants described innovation funding streams, but articulated difficulty securing funding beyond the start-up phase.

"The project was resourced sufficiently for the pilot. However, once the pilot finished so did the project." R5

"the education faculty and funding is driven towards innovation and not sustainability - this de-incentives individuals from continuing with existing projects" R8

Burnout, turnover and lack of protected time

Participants described projects that were limited by staff burnout, turnover, and a lack of protected time.

"My commitment to the project was there however the resources I had to continue with project were limited due to competing pressures on my time." R12

"The programme required more administrative support than anticipated & this ended up being an ask over & above someone's day job for a prolonged period of time" R16

"*the most important person was our pharmacist who moved from the pharmacy a few months after we started!"* R61

Risk as integral to innovation

Finally, it is worth noting that participants felt that risk was a necessary ingredient of healthcare innovation. Innovations that fail to demonstrate value should be supported in folding without hesitation, and lessons shared.

> *"The project demonstrated that this initiative was not a model that would work in the hospital environment hence could not be embedded"* R30

Final framework

We created two 2x2 matrices containing all the significant success factors across each dimension of success, shown in Figure 4. The matrix on the right excluded low-value projects in the calculation of factors significant to expansion and served to support the inclusion of some marginal factors in the final model as they became more significant despite lower power.

Figure 4: Critical success factors plotted according to their salience to success

Figure 4 shows clearly congruent clusters of factors in each quadrant, indicating that some types of factors may be more important to expansion, whilst others are more important to value creation. These clusters relate to skills & expertise, leadership & motivation, organisational fit & structural support, societal alignment & participation, and evaluation.

As outlined in table 1, there are questions as to whether evaluation and motivation are dependent rather than independent variables: does finding working on a project personally rewarding drive success or vice versa, and does a positive evaluation drive success or vice versa? Triangulation with qualitative comments (in table 2) suggest that evaluation and motivation may drive success, so they have been tentatively included in our final model.

Themes that were predominantly related to value creation (participation, motivation and evaluation) were labelled **value-creation factors.** Themes that were predominantly significant to expansion (organisational fit & structural support) were labelled **expansion factors**. Themes that were significant to both axes (expertise, leadership and a supportive network) were labelled **core success factors**. We arranged success factors into a nested hierarchy, as innovations that do not generate value are unlikely to be scaled up. Our final model in Figure 5, also lists potential **limiting factors** identified through our inductive qualitative analysis .

Figure 5: Nested hierarchy of success factors and limiting factors for health service innovation

Discussion

This analysis of 56 health service innovation projects has enabled us to propose a model for understanding success in health service innovation that has two discrete axes: one relating to whether or not the innovation created value for its intended beneficiaries; the other relating to whether or not it was scaled up beyond the original pilot. Comparing projects across these dimensions of success has enabled us to hypothesise that:

- The core drivers of success are leadership and collaborative expertise (leadership skills and commitment, expert input, sufficient staff with the right skills and expertise, and a supportive collaborative network)
- The drivers of value creation for the intended beneficiaries are participation, motivation and evaluation (involvement of patients, public, practitioners and communities, alignment to societal needs, internal motivation, finding the project work rewarding, ability to demonstrate benefits and having opportunities to share impacts)
- The drivers of sustainability and scale-up are organisation fit and structural support (organisational fit and alignment, administrative and educational support, staff with time and energy).

Additional limiting factors were described at the boundaries and intersections between organisations, professions, sectors and cultures; a lack of structural support beyond the start-up phase; and staff burnout and turnover.

Within healthcare services, the issue of diffusion and sustainability of innovation has received widespread academic attention pioneered by Greenhalgh et al. [22] who drew on Rogers' seminal text on Diffusion of Innovations [23]. There have been many subsequent notable academic contributions [24-28]. Nilsen proposed an overarching framework of healthcare implementation theories according to the aim of the theory [29]. Theories such as those about innovation sustainability, which include the Diffusion of Innovation theory, were categorised as "determinant frameworks", as they posit general types of factors that can influence the success of an innovation. We believe that our findings contribute through empirical evidence to theoretical development at this level, and thus may have wider implications than programme-level data would normally allow. According to Nilsen, such theories have typically been analysed and formulated across individual studies, at the level of meta-analysis or review [29] and may therefore be one or more steps removed from the underlying data. This study is different in that we have developed mid-range theory that is empirically grounded in programme-level data, and there is a clear line between our data and the generated theory.

Conceptions of innovation success tend to focus on sustainability [30] and scale-up [24]. We suggest that both are contingent on the ability of an innovation to provide value to its intended beneficiaries in the first place. There are few theories grounded in empirical data that explain this dimension of success. Our findings highlight the importance of patient, public and practitioner involvement, alongside the core success factors of leadership and collaborative expertise. We suggest that these are fundamental preceding factors to either sustainability or scale-up.

This 'value for intended beneficiaries' dimension of success also allows us to conceptualise a valuable innovation that is not growing or expanding. This, we argue, is important: healthcare innovations may have parameters within which growth and expansion are constrained, perhaps because their aims have been achieved, or because the context changes. An innovation that has met its aims but has not expanded beyond its natural boundary should be properly positioned as such.

Our ability to research a set of potentially valuable projects that were scaled down or stopped, many of which never reach the literature, may have afforded novel insights. Fixsen suggests that sustainability can only be asserted when the funding to support implementation is withdrawn [31]. Stirman's systematic review suggests sustainability can be asserted after a period of two years [32]. Our findings suggest that continued structural support, particularly organisational, administrative and educational support, may be critical to a project's sustainability and scalability, and that their withdrawal may destroy potentially valuable innovations.

Finally, our findings further validate the work of Dopson and Fitzgerald [33], whose qualitative exploration of a similar set of health service innovations highlighted the importance of context and process over content: it is not so much *what* you are trying to achieve, it is *how* you do it and the organisational and interpersonal contexts that you work within that matter.

A limitation of this research is its highly contextual nature. Our results may not be generalisable to all contexts, however repeating these methods may produce locally relevant results. The analysis of variance depends on the universe of potential factors having been correctly identified and a large enough number of innovations to produce statistical significance. The research could be improved by more extensive validation of factors, patient and public involvement, further testing the directionality of tentative factors, a greater geographical spread, and a greater number of projects to allow for finer grading across the expansion axis.

Conclusions

Our findings suggest that organisations and policy makers wishing to support service-level innovation in similar healthcare contexts address the factors identified through this research as critical to success.

Such strategies might include:

- supporting innovators with the right skills and expertise, including leadership skills, implementation support and evaluation expertise;
- innovation networks to provide opportunities to showcase success and provide a peer community of expertise and support;
- emphasising participatory practices and collaborative approaches, so that innovations are more likely to align to societal and organisation goals and generate value for patients, communities and practitioners;
- providing administrative and educational support during the scale-up phase, and ensuring that this support is maintained or handed over rather than withdrawn to schedule;
- recognising and enhancing the internal motivation and drive of innovators as well as more goal-oriented motivations such as career needs.

At a structural level, the boundaries between organisations, professions, and the health and social care sectors may need to be addressed as potential barriers to successful innovation.

More research is needed to confirm whether addressing these factors prospectively enhances the success of future innovations.

Contributorship statement

KLG and GR contributed to the conception and design of the work and to the acquisition of data. KLG, GR and AK collaborated on the data analysis and interpretation. KLG and AK drafted the work, all authors revised it critically for important intellectual content. All authors have approved the final version and agree to be accountable for all aspects of the work and to resolve questions relating to accuracy or integrity.

Competing interests

There are no competing interests.

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Data sharing statement

Due to the highly individual nature of healthcare innovations and the limited geographic area of this study, we are unable to provide our raw data. We undertake to provide a redacted data set upon reasonable request.

Supplementary data

Full text survey

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Figure legends

Figure 1: Research overview

Legend: A mixed-methods sequential research process to explore and explain success factors and limiting factors in health service innovation.

Figure 2: Survey scope

Legend: The survey scope was based on a qualitative review of theories and findings relating to the sustainability and scale-up of health service innovations (Lennox et al, 2018) supplemented by five scoping interviews. The questions are listed in table 1, and the full text survey is in the supplementary material.

Figure 3: Framework for categorisation of success within health service innovation

Legend: Health service innovations were categorised across two dimensions of success through an inductive classification process. The horizontal axis relates to how successful innovations were in realising their intended value: “did it create more or less than its intended value for beneficiaries?” The vertical axis relates to expansion: “was the innovation scaled up or scaled down from the original pilot?” Numbers in brackets indicate how many innovations were found in each category.

Figure 4: Critical success factors plotted according to their salience to success

Legend: Critical success factors plotted according to their significance to success on a natural logarithmic scale so that factors above and to the right of the dotted line have significance >=0.05. The expansion axis indicates significance to whether a project is scaled up or down beyond the original pilot. The value creation axis indicates significance as to whether it creates more or less than its intended value for beneficiaries.

Figure 5: Nested hierarchy of success factors and limiting factors for health service innovation

Legend: Factors that may be significant to both value generation for the intended beneficiaries *and* to whether the innovation is scaled up beyond the original pilot are labelled as core needs. Factors that may be significant specifically to value generation are the next priority (middle layer) as innovations that do not generate value

will not become embedded or spread. Finally, factors that may primarily be significant to expansion are presented in the outermost layer. Additional limiting factors were identified through an inductive analysis of qualitative responses from projects that had scaled down or failed to produce their intended value.

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Table 1: Analysis of variance of potential success factors across categories of success

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
1	The initiative was designed to end once a set outcome had been achieved	↘ -0.40	0.274	0.172	0.317	
2	The initiative was designed to end after defined period of time	↘ -0.58	0.011	0.011	0.288	Unsurprisingly, even projects with high realised value finish if they are time-bound
3	The initiative was designed to address an important healthcare need	↑ 1.63	0.765	0.712	0.135	
4	There was public/political recognition and concern for the problem that the initiative was designed to address	↑ 1.23	0.939	0.66	0.201	
5	The initiative was based on a strong evidence base, and it was credible that the stated benefits could be achieved through the project plan	↑ 1.35	0.696	0.355	0.299	
6	The project was sufficiently funded	↗ 1.17	0.941	0.454	0.126	
7	The project had sufficient infrastructure, such as buildings, office space, materials or supplies	↑ 1.52	0.952	0.842	0.613	
8	There were sufficient members of staff with the right skills to meet the requirements of the initiative	↑ 1.42	0.003	0.002	0.013	Skilled workforce is a critical success factor across all definitions of success
9	Members of staff had sufficient energy and time to dedicate to the initiative	↑ 1.21	0.033	0.085	0.362	Time and energy are critical to whether proven innovations expand
10	There was sufficient administrative support to deliver and maintain the initiative	↗ 0.85	0.013	0.019	0.142	Administrative support is critical to whether an innovation expands
11	There was sufficient technical support to deliver and maintain the initiative	↗ 1.04	0.113	0.187	0.657	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
12	There was sufficient educational support to deliver and maintain the initiative	↑ 1.30	**0.023**	**0.012**	0.089	Educational support is critical to whether an innovation expands
13	External political or societal factors impacted negatively on the delivery of the initiative	↘ -0.91	0.191	0.141	**0.005**	External political or societal factors appear critical to whether an innovation is able to realise its intended value (inconsistent exposure/response)
14	It was necessary to adapt the project so that it aligned more closely with external political or societal priorities	↘ -0.72	0.541	0.252	0.064	
15	We had opportunities to demonstrate the benefits of this innovation within our organisation and/or to other organisations	↑ 1.59	0.237	0.053	**0.02**	Unsurprisingly innovations that were able to realise their intended value, were more likely to be able to demonstrate the benefits of their innovation
16	Steps were taken to raise the profile of the initiative e.g. through media, marketing, community engagement or publications	↗ 0.85	0.108	0.059	0.306	
17	There are plans to replicate this innovation at other sites or spread it to other parts of the organisation	↗ 0.58	**0.024**	**0.012**	0.228	Unsurprisingly, innovations that have become scaled up were more likely to say there were plans to spread their innovation
18	The initiative integrated well into existing organisational structures, programmes or policies	↑ 1.26	**0.012**	**0.002**	0.059	The ability of an innovation to integrate into existing organisational structures may be critical to whether it becomes scaled up
19	It was necessary to adapt the initiative so that it achieved a good fit with existing organisational structures, programmes or policies	→ -0.09	0.053	**0.035**	0.115	For innovations to scale up, they may need to adapt so that they fit within existing organisational structures.
20	The host organisation was ready and able to undertake the initiative	↑ 1.55	0.262	0.168	0.721	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
21	The initiative was hampered by opposition from within the host organisation	↓ -1.50	**0.037**	**0.027**	0.398	However valuable an innovation is, it appears unlikely to survive if it is opposed within the host organisation.
22	The host organisation lacked the necessary values/culture to support and sustain the initiative	↓ -1.17	0.265	0.247	0.888	
23	I was released from other duties so that I could implement this initiative	↘ -0.43	0.732	0.893	0.789	
24	I had a supportive peer network that I could discuss any issues or problems with	↑ 1.32	0.385	0.562	0.79	
25	I was internally motivated to implement this initiative	↑ 1.81	0.425	0.129	**0.034**	Innovations appear more likely to realise their value if the innovator is internally motivated
26	I found working on the initiative personally rewarding	↑ 1.81	0.147	0.067	**0.022**	Unsurprisingly, there is a correlation between an innovation realising its value, and the innovator finding it rewarding.
27	I feel I had the right skills/experience/training to implement and sustain the initiative	↑ 1.62	**0.033**	**0.008**	**0.023**	The skills of the innovator appear to be a critical success factor across all definitions of success.
28	I had sufficient energy and time to dedicate to the initiative	↗ 1.06	0.209	0.268	0.498	
29	The project had sufficient input from experts with the necessary knowledge and experience	↑ 1.66	0.134	**0.018**	**0.021**	Expert input appears critical to both realisation of value, and to whether it expands.
30	The outcomes and impact of the project were measured or assessed	↑ 1.37	0.060	0.125	0.119	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
31	We were able to demonstrate the effectiveness of the project	↑ 1.38	0.463	0.185	**0.015**	Unsurprisingly innovations that were able to realise their intended value, were more likely to be able to demonstrate the effectiveness of their innovation.
32	Performance data was gathered and reported on a regular basis	↗ 1.04	0.346	0.266	0.159	
33	Steps were taken to systematically improve and adapt the project	↑ 1.44	0.293	0.153	0.377	
34	There was ongoing orientation and training available e.g. to new staff or to build capacity	↗ 0.87	**0.034**	**0.03**	0.153	The availability of ongoing training may be critical to whether successful innovations scale up
35	Staff were given time/incentives to attend the necessary training	→ 0.47	0.096	0.159	0.178	
36	Staff were required to attend the necessary training	→ 0.11	0.348	0.271	0.767	
37	The initiative was difficult or complex to deliver	→ -0.09	0.294	0.163	0.158	
38	The initiative helped to make things easier or more efficient	↗ 0.76	0.86	0.953	0.182	
39	The initiative did not require special or extra effort	↓ -1.09	0.979	0.869	0.597	
40	I believe that the staff delivering the initiative found the work/tasks rewarding and satisfying	↑ 1.59	0.368	0.456	0.743	
41	The project team worked well together	↑ 1.74	0.416	0.796	0.893	
42	There were clear responsibilities for individuals the work was shared across the team	↑ 1.45	0.945	0.533	0.066	
43	Project was overly dependent on a particular individual or individuals	↗ 0.57	0.708	0.355	0.29	

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
44	I believe that the team understood what the project was trying to achieve and that it would lead to improved processes and outcomes	↑ 1.62	0.218	0.165	0.772	
45	There were rewards or incentives that supported engagement with, and continued delivery of, the initiative	→ 0.07	0.45	0.638	0.228	
46	The activities and roles of the initiative were incorporated into job descriptions	↘ -0.30	0.29	0.243	0.141	
47	Staff had time within their working hours to complete the tasks of the initiative	↗ 0.59	0.251	0.138	0.328	
48	The initiative had leadership and/or champions who were committed and capable	↑ 1.62	**0.003**	**0.001**	**0.006**	Leadership appears to be a highly significant success factor across all definitions of success.
49	There was an appropriate balance of power between those involved with the initiative	↗ 1.15	0.697	0.775	0.929	
50	Team members were able to express their opinions, and their opinions were valued	↑ 1.91	**1 (no variance)**	**0.049**	**0.026**	Distributed decision making may be a critical success factor across all definitions of success. It was common to all innovations of value that scaled up (hence no variance)
51	There was a sense of ownership and commitment by those involved with the initiative	↑ 1.79	0.284	0.177	0.102	
52	Staff who were responsible for delivering the initiative were involved as partners, and were able to shape the initiative	↑ 1.74	0.306	0.176	**0.031**	Participatory processes with staff may be critical to the ability of a project to realise its intended value.

	Factor	Average answer across all categories*	Distribution of factor is the same across categories of expansion (proven value)	Distribution of factor is the same across categories of expansion (all)	Distribution of factor is the same across categories of realised value	Interpretation and comment on secondary analysis***
			Sig.**	Sig.**	Sig.**	
53	The beneficiaries (patients/service users) were involved as partners, and were able to shape the initiative	↗ 0.83	0.45	0.139	**0.027**	Participatory processes with patients/service users may be critical to the ability of a project to realise its intended value.
54	The community in which it was situated were involved as partners, and were able to shape the initiative	↗ 0.96	0.177	**0.034**	**0.023**	Participatory processes on a community level may be critical to both the ability of a project to realise its value, and its scalability.
55	There was a collaborative network of people/organisations that helped to support and sustain the initiative	↑ 1.30	**0.008**	**0.007**	**0.003**	The support of a collaborative network of people/organisation may be highly significant to both value creation and scalability.
56	It felt as though the initiative was imposed on us and there was little sense of ownership or commitment to the project	↓ -1.64	0.684	0.488	0.326	

Foot note to table 1: Analysis of variance of potential success factors across categories of success

* Respondents on average ↑= agree, ↗=somewhat agree, →=neither agree not disagree, ↘= somewhat disagree, ↓=disagree

** Asymptotic significances are displayed. The significance level is 0.05.
The darker the shading, the safer it is to reject the null hypothesis. Sig <0.05 indicates >95% certainty that the difference between categories is not random.

*** Secondary analysis examined the direction of the association and the strength of effect across categories of success.

Table 2: Factors that are significantly associated with innovation success with illustrative quotes

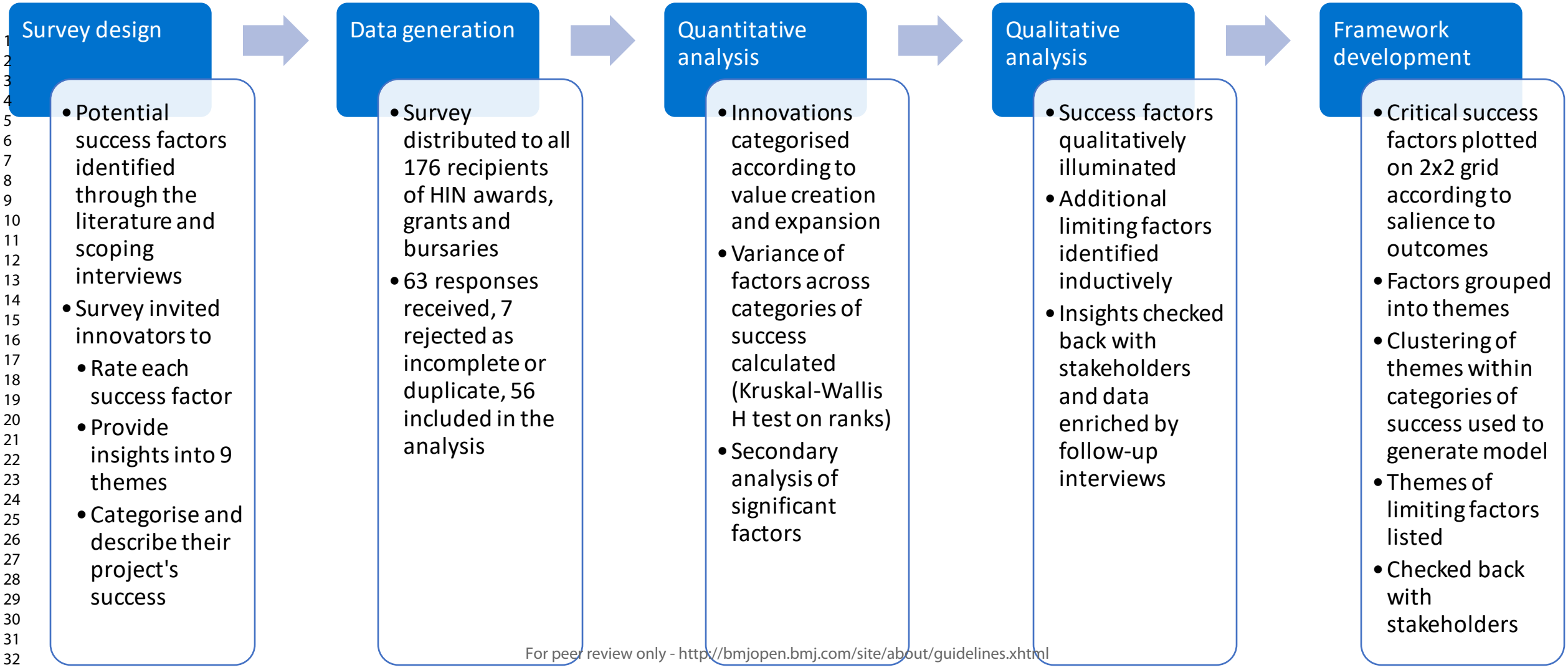
Significant factors by theme (significant to value or expansion)	Illustrative quotes
Theme 1: Project aims	None of the factors related to the aims of the project were significant
Theme 2: Resources & support • There were sufficient members of staff with the right skills to meet the requirements of the initiative (significant to expansion & value) • Members of staff had sufficient energy and time to dedicate to the initiative (expansion) • There was sufficient administrative support to deliver and maintain the initiative (expansion) • There was sufficient educational support to deliver and maintain the initiative (expansion)	"The programme support sat with one individual rather than a team and as highlighted previously the administrative/programme support hadn't been entirely appreciated/factored in at the outset of the programme." R16 "There are innovators out there who are doing things on their own, and the person I'm thinking about is not in a very good place. He's got virtually no support, and I don't know how he does it." FI2 "The resources needed in terms of administration and support were underestimated. We input far more time and admin resources than originally planned." R15 "The envelope of funding available did not enable us to fully develop a training package which was what we had initially hoped to do." R25
Theme 3: How the project interfaced externally • External political or societal factors impacted negatively on the delivery of the initiative (value, scored negatively) • We had opportunities to demonstrate the benefits of this innovation within our organisation and/or to other organisations (value)	"The project piggy-backed on the current social movement highlighting the needs of mental health." R18 "Hearing has always been the poor relation to other health issues even though everyone knows someone struggles with their hearing either family or friends." R35
Theme 4: Organisational factors • The initiative integrated well into existing organisational structures, programmes or policies (expansion) • The initiative was hampered by opposition from within the host organisation (expansion)	"The project was presented in [area] Council, [area] NHS Trust, to the public health team in the council and the voluntary sector in [area]. It was aligned with local priorities and local initiatives. A journal article is being drafted." R13 "There was also a disconnect between commissioner priorities & [*the host organisation's*] priorities in relation to the programme, which impacted on its sustainability & roll-out." R16

Theme 5: Personal factors • I was internally motivated to implement this initiative (value) • I found working on the initiative personally rewarding (value) • I feel I had the right skills/experience/training to implement and sustain the initiative (expansion & value)	"I was very motivated to implement this project which was demanding as I had no protected time for it. Nonetheless, you do what is needed to achieve a goal." R18 "I am very proud of our achievements and that the work has become a routine part of our culture and system of working" R28 "On reflection I needed to lead this project more strongly. I tried to be facilitative and not prescriptive, but the staff were not experienced enough to utilise this opportunity. They needed more direction and support. There was some conflict between the educators and the substantive staff." R10
Theme 6: Project management • The project had sufficient input from experts with the necessary knowledge and experience (value) • We were able to demonstrate the effectiveness of the project (value)	"As the project was run within [*university*] and [*tertiary hospital trust*], there was plenty of expertise to call upon as required." R6 "The ongoing reporting allowed for the results to be understood early in the project, shared and used in the strategy for delivering education across [*region*]" R5 "A robust evaluation was undertaken of the programme, along with regular review points to inform adaptations/opportunities for improvement." R16
Theme 7: Tasks of the project	No factors relating to the tasks of the project were significant
Theme 8: Team processes • There was ongoing orientation and training available e.g. to new staff or to build capacity (expansion) • The initiative had leadership and/or champions who were committed and capable (expansion & value) • Team members were able to express their opinions, and their opinions were valued (expansion & value)	"We always express the value of our service users, administrator, and other members of the team and meet regularly to discuss well-being, progress, and evaluation." R33 "The team got on. It was a lovely team and dynamics. We all believed in the idea and were excited about it. Obviously the project needs expertise in [*technology*], so in that regard the work was dependent on the availability of such expertise within the team." "Leadership hasn't been invested in providing the platform for the workshops & curriculum to be rolled out. Lip service given by leadership." R56 "This programme was carried out by a team but lead by myself. Other parties lacked the time and incentive to commit to running and leading the programme after the 12 months of my time being project lead" R46

Theme 9: Collaborative and participatory practices • Staff who were responsible for delivering the initiative were involved as partners, and were able to shape the initiative (value) • The beneficiaries (patients/service users) were involved as partners, and were able to shape the initiative (value) • The community in which it was situated were involved as partners, and were able to shape the initiative (value) • There was a collaborative network of people/organisations that helped to support and sustain the initiative (expansion & value)	"We've had some sort of service user involvement all the way through... that's really improved the way we've reflected and talked… it gives a genuineness to what we're trying to achieve… the fact that you go and work with the associates and carers, you actually go and look at the environment, you spend time with the nurses that you're going to be teaching and all the other people that you're working with, really helps to, you know, it definitely adds value to the project." FI3 "There was a single practitioner using the resource on her own, and now it is nationally recognised… Without that level of support: the time, the people and the resources, we wouldn't have got anywhere. It's been a fantastic level of support. They designed an implementation toolkit to support practitioners embedding the programme locally." FI2 "The team at the [*innovation network*] were fabulous and so supportive." R12

Footnote to table 2:

The nine themes and factors were derived from a qualitative review of the literature supplemented by stakeholder interviews. Significant factors were derived through a survey that explored salience of factors to outcomes. Survey respondents are indicated by R(n) and follow-up interview respondents by FI(n).



Project aims

- Designed to address an important healthcare need
- Public recognition and concern for the needed
- Strong evidence based for the intervention

Resources

- Funding
- Infrastructure
- Sufficient skilled staff
- Staff with time & energy
- Admin support
- Technical support
- Educational support

External relations

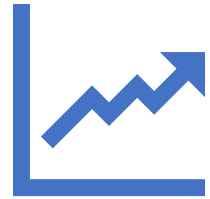
- Societal political fit
- Adapted to fit social political agenda
- Opportunities to demonstrate benefits
- Active profile raising

Host organisation

- Organisational fit
- Adapted for organisational fit
- Host capabilities
- Host opposition
- Host values/culture

Personal factors

- Protected time
- Peer support
- Internal motivation
- Project felt personally rewarding
- Skills & expertise
- Time & energy



Implementation factors

- Expert input
- Outcomes measured
- Effectiveness demonstrated
- Performance data reported
- Systematic improvements
- Ongoing training
- Training incentivised
- Training required

The work/tasks

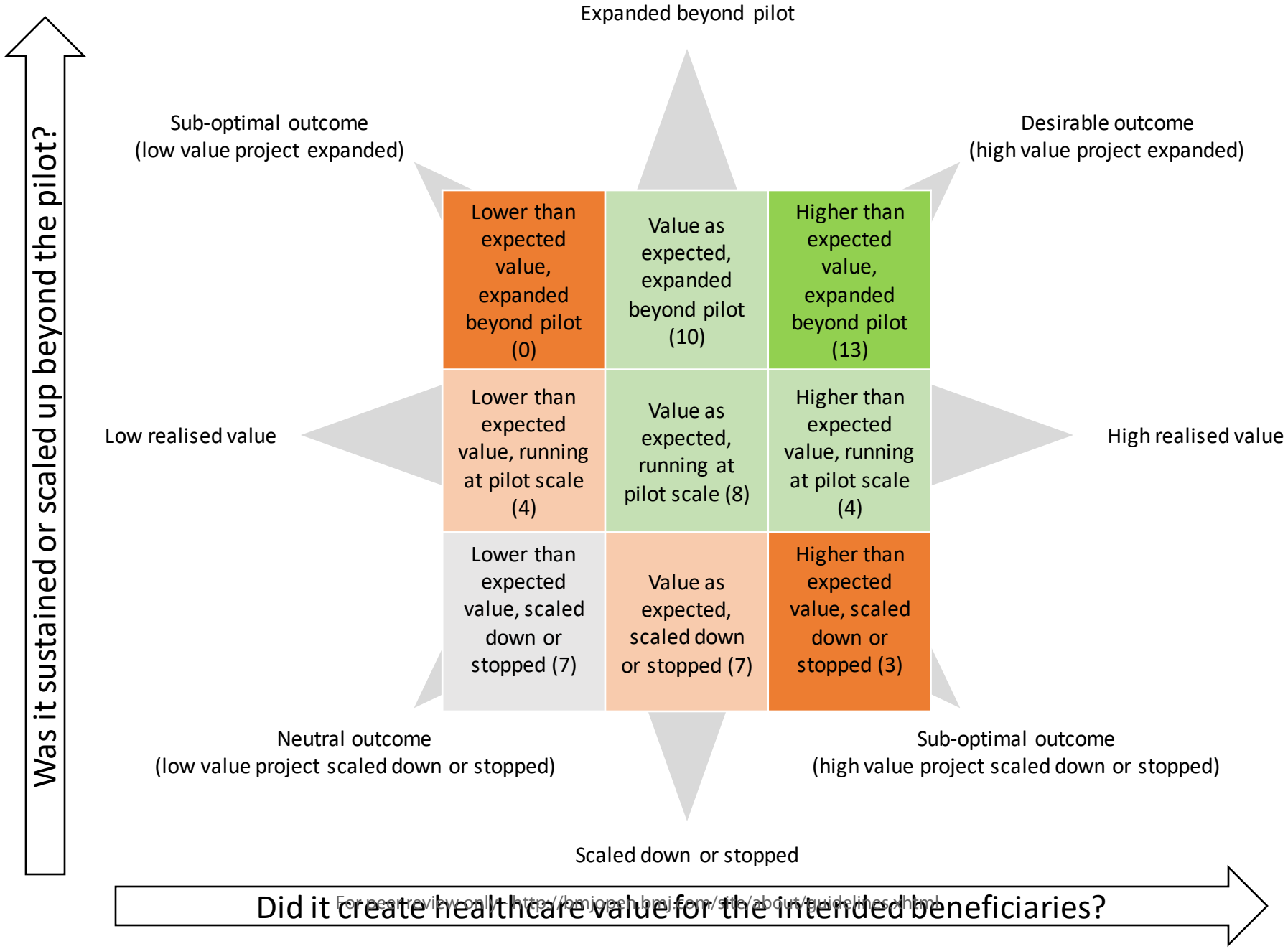
- Task difficulty
- Made things easier
- Made extra work
- Tasks felt rewarding

Team factors

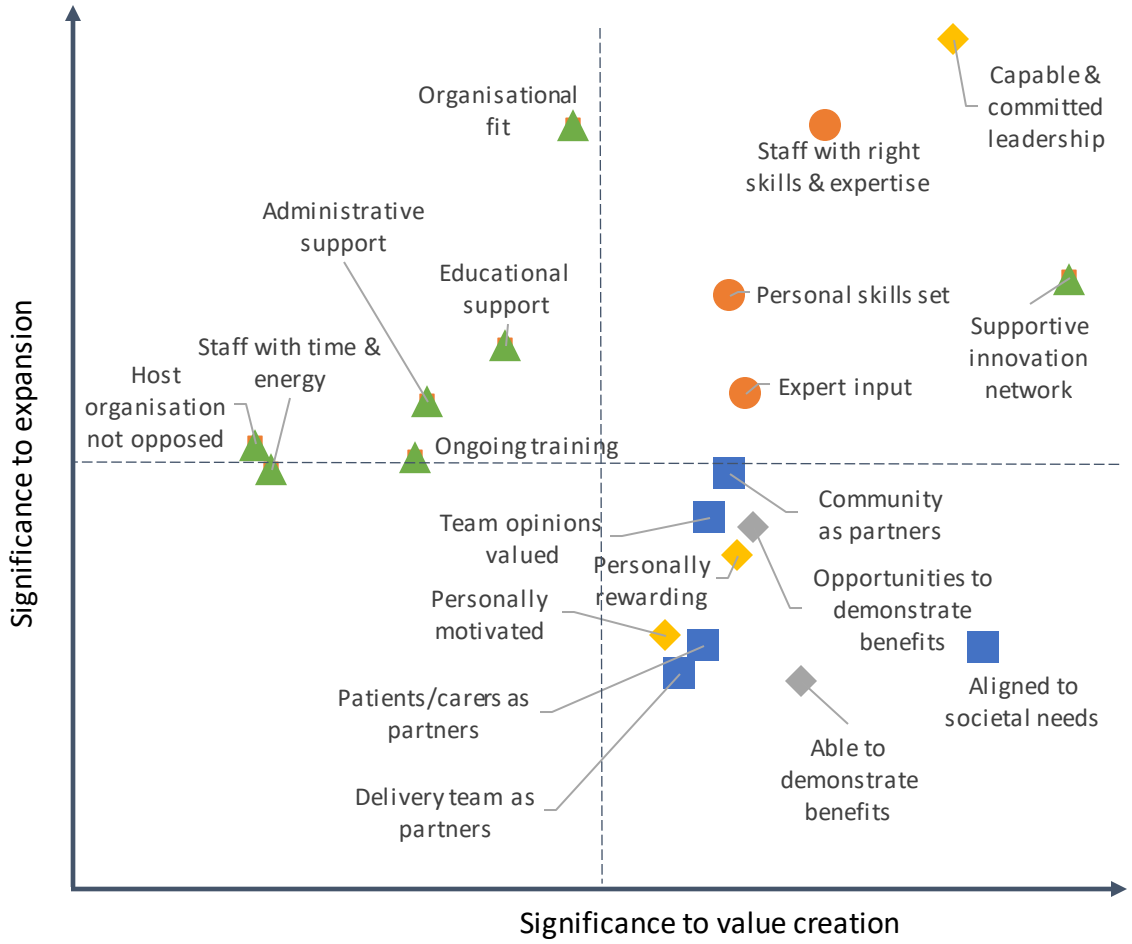
- Team cohesion
- Work shared
- Dependent on an individual
- Belief in project
- Engagement incentivised
- Roles in job descriptions
- Tasks within working hours
- Team leadership committed & capable
- Good balance of power
- Team opinions valued

Participation

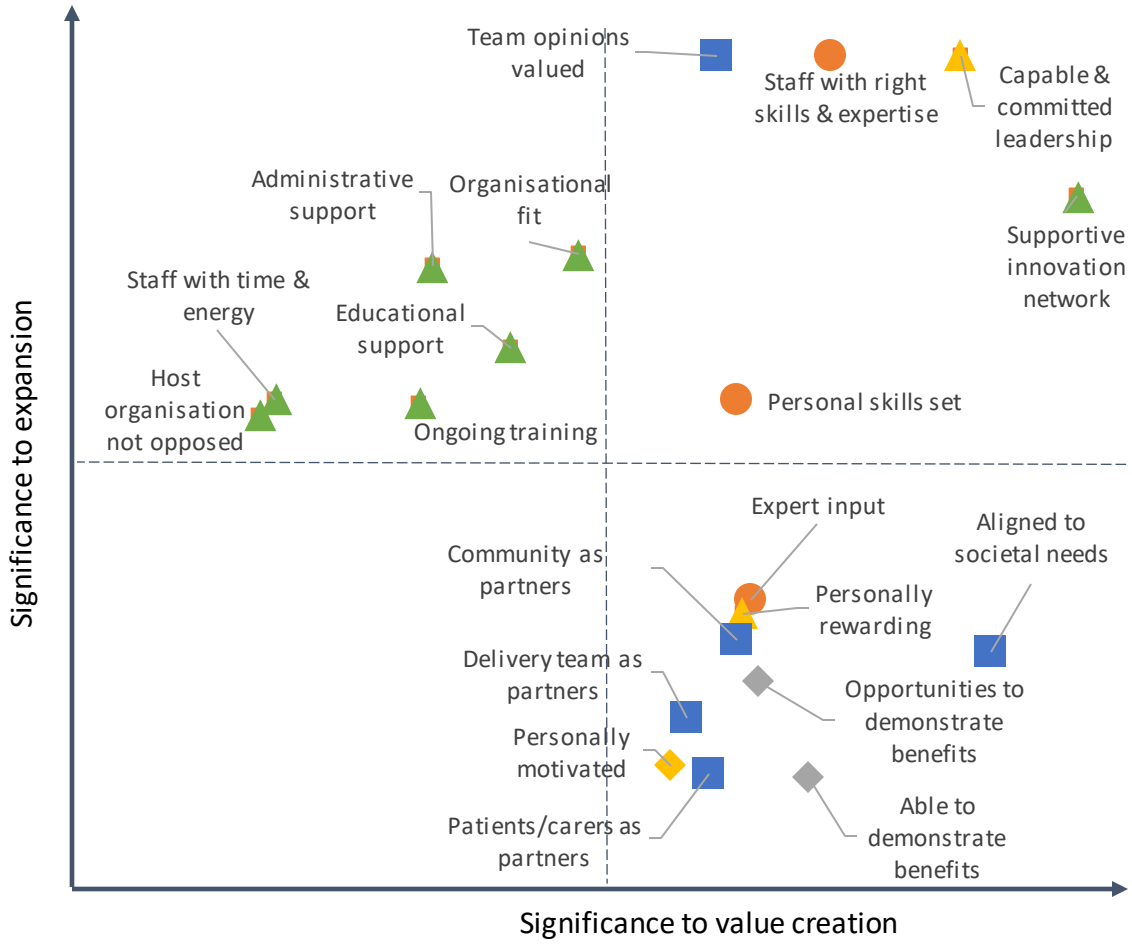
- Stakeholder participation
- Staff participation
- Patient/service user participation
- Community participation
- Collaborative supportive network
- Project felt imposed



Significance of factors to value creation and expansion



Significance to value creation and expansion of higher value projects



Critical success factors plotted according to their significance to success

- Natural logarithmic axes: factors above and to the right of the dotted line have significance >=0.05
- Expansion axis: significance to whether a project becomes embedded or spread
- Value creation axis: significance to clinical value "did it work for the intended beneficiaries"

Key

- = skills & expertise
- = participation
- = evaluation
- = resourcing & support
- = leadership skills & motivation

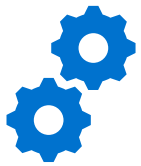
Nested Hierarchy of Needs for Success in Health Service Innovation

Core success factors are important to whether an innovation creates value, *and* to whether it embeds or spreads:

- Leadership skills, expertise and capability
- Sufficient staff with the right skills and expertise
- Expert input and a supportive collaborative network of innovators

Value creation factors are specific to whether an innovation creates value for its intended beneficiaries:

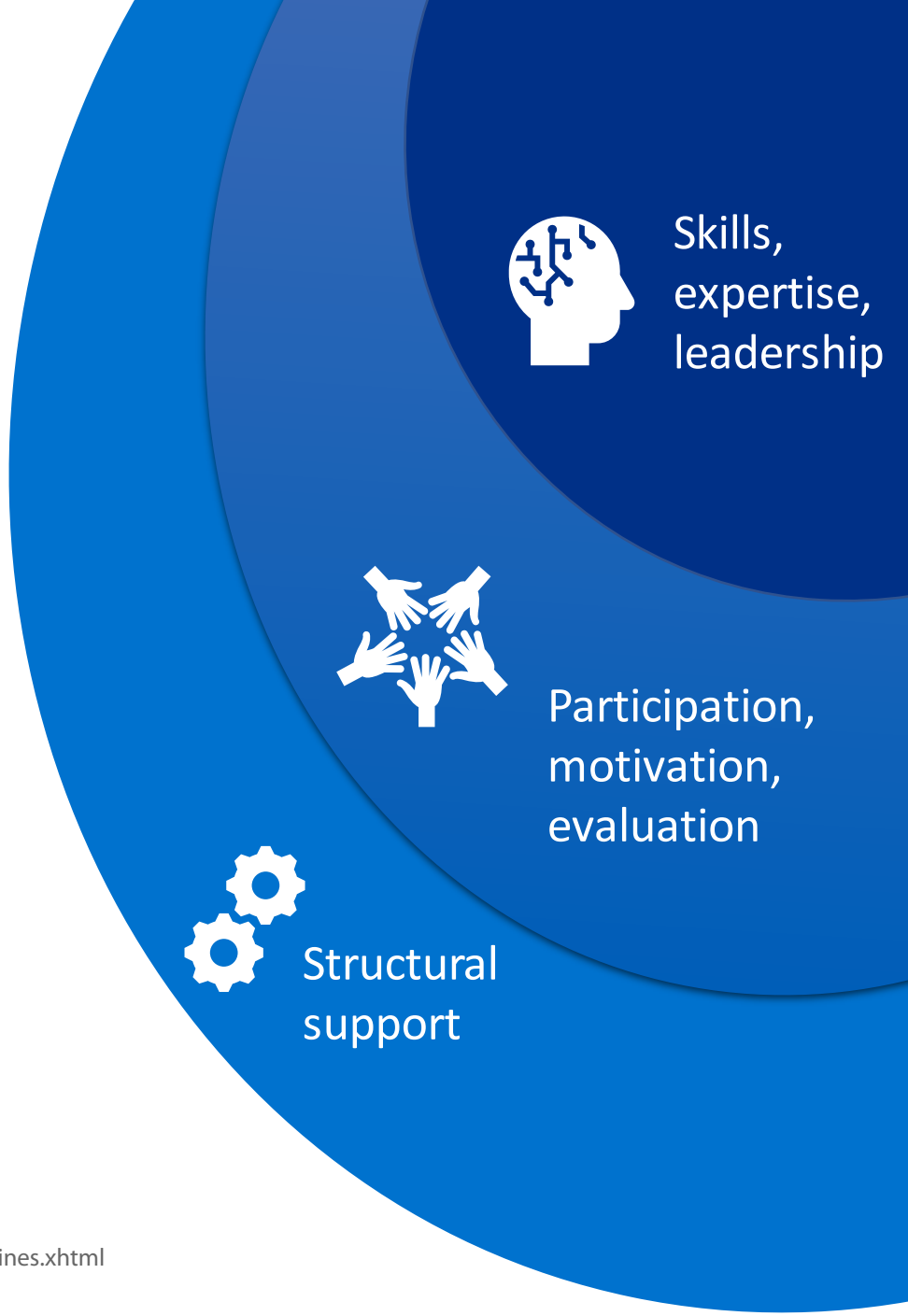
- Involvement of patients, public, practitioners and communities; alignment to societal needs
- Motivated leadership, opportunities to showcase success



Expansion factors are specific to whether a valuable innovation embeds or spreads:

- Organisational fit and support
- Access to administrative and educational support
- Staff with time and capacity

Additional limiting factors were described at the boundaries and intersections between organisations, professions, sectors and cultures; lack of structural support beyond the start-up phase; staff burnout and turnover



Sustaining and embedding healthcare innovations - HIN evaluation - post scoping

Start of Block: Opening block

Q1

Sustaining and embedding healthcare innovations: an evaluation for the Health Innovation Network and Health Education England

This questionnaire is being conducted by King's College London on behalf of Health Education England and the Health Innovation Network (HIN). The questionnaire aims to explore factors influencing the long term success of healthcare innovations. You will be asked to rate a set of factors that have been identified from the current literature and evidence.

Each rating should represent your overall impression of whether the factor has influenced the project named below. Please use the free text boxes to help us understand any factors that you feel are particularly important.

How will my responses be used?

HIN would like to support healthcare innovators so that their projects are more likely to become sustained and embedded. Aggregated responses will be used by HIN to target training and development, and to disseminate learning about factors that impact on the sustainability of healthcare innovations. You will not be identified as a respondent.

Why have I been approached?

You are the named recipient of ${e://Field/Award} from the Health Innovation Network of South London. This project has been approved by King's College Research Ethics Committee Ref: LRS-18/19-10432.

Which project does this survey relate to?

${e://Field/ProjectTitle}

Q3 Please tell us about the above named project (select one)

- ○ It is no longer running (you can tell us why later) (1)
- ○ It is running, but likely to finish soon (2)
- ○ It is running in a stable way but has NOT been adopted beyond its original pilot (3)
- ○ It is running in a stable way and HAS been adopted beyond its original pilot (4)
- ○ It is too early to have a view on its long term status (5)
- ○ Other (7) _____

Q4 Tell us about yourself (tick ALL that apply)

- ☐ I am part of the project leadership team (1)
- ☐ I am part of the project administrative team (2)
- ☐ I am part of the project training team (3)
- ☐ I am a healthcare/socialcare professional delivering this project to patients/service users (4)
- ☐ I am a patient/service user (5)
- ☐ Other (please describe) (6) _____

End of Block: Opening block

Start of Block: The Project

Q18 **Factors relating to the type of project, and what it was trying to achieve.**

Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q66 The initiative was designed to end once a set outcome had been achieved.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q67 The initiative was designed to end after defined period of time.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q68 The initiative was designed to address an important healthcare need.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q69 There was public/political recognition and concern for the problem that the initiative was designed to address.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q72 The initiative was based on a strong evidence base, and it was credible that the stated benefits could be achieved through the project plan.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q79 Insights or details relating to the type of project or what it was trying to achieve, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The Project

Start of Block: Resources

Q26 **Factors relating to how well the project was resourced.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q65 The project was sufficiently funded.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q36 The project had sufficient infrastructure, such as buildings, office space, materials or supplies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q37 There were sufficient members of staff with the right skills to meet the requirements of the initiative.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q38 Members of staff had sufficient energy and time to dedicate to the initiative.

- [ ] Agree (1)
- [ ] Somewhat agree (2)
- [ ] Neither agree nor disagree (3)
- [ ] Somewhat disagree (4)
- [ ] Disagree (5)
- [ ] Don't know (6)

Q35 There was sufficient administrative support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q39 There was sufficient technical support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q40 There was sufficient educational support to deliver and maintain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q87 Insights or details relating to how well the project was resourced, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Resources

Start of Block: External environment

Q47 **Factors relating to how the project intersected with the external environment.** Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q41 External political or societal factors impacted negatively on the delivery of the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q42 It was necessary to adapt the project so that it aligned more closely with external political or societal priorities.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q43 We had opportunities to demonstrate the benefits of this innovation within our organisation and/or to other organisations.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q44 Steps were taken to raise the profile of the initiative e.g. through media, marketing, community engagement or publications.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q45 There are plans to replicate this innovation at other sites or spread it to other parts of the organisation.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q92 Insights or details relating to how the project intersected with the external environment, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: External environment

Start of Block: The organisation

Q49 **Factors relating to the host organisation within which this initiative was situated.** Your comments will not be fed directly back to the host organisation, however they may be used to identify a training need. Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

We believe the host organisation for this innovation to be:
${e://Field/Organisation}

If you are referring to another organisation (e.g. CCG, Hospital Trust) please name it here:

_____

Q48 The initiative integrated well into existing organisational structures, programmes or policies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q50 It was necessary to adapt the initiative so that it achieved a good fit with existing organisational structures, programmes or policies.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q51 The host organisation was ready and able to undertake the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q52 The initiative was hampered by opposition from within the host organisation.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q53 The host organisation lacked the necessary values/culture to support and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q97 Insights or details relating to the host organisation within which this initiative was situated, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The organisation

Start of Block: Personal factors

Q148 **Factors relating to yourself.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important. We respect your privacy: individual responses will not be linked to you or your project. Please skip any questions you do not feel comfortable answering.

Q150 I was released from other duties so that I could implement this initative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q151 I had a supportive peer network that I could discuss any issues or problems with.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q152 I was internally motivated to implement this initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q78 I found working on the initiative personally rewarding.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q153 I feel I had the right skills/experience/training to implement and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q149 I had sufficient energy and time to dedicate to the initative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q154 Insights or details relating to yourself, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Personal factors

Start of Block: Implementation

Q55 **Factors relating to how the project was implemented.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q54 The project had sufficient input from experts with the necessary knowledge and experience.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q56 The outcomes and impact of the project were measured or assessed.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q57 We were able to demonstrate the effectiveness of the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q58 Performance data was gathered and reported on a regular basis.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q59 Steps were taken to systematically improve and adapt the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q60 There was ongoing orientation and training available e.g. to new staff or to build capacity.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q61 Staff were given time/incentives to attend the necessary training.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q62 Staff were required to attend the necessary training.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q105 Insights or details relating to how the project was implemented, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Implementation

Start of Block: The work/tasks

Q64 **Factors relating to the tasks of the project.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q63 The initiative was difficult or complex to deliver.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q65 The initiative helped to make things easier or more efficient.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q66 The initiative did not require special or extra effort.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q67 I believe that the staff delivering the initiative found the work/tasks rewarding and satisfying.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q109 Insights or details relating to the tasks of the project, and how this has impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: The work/tasks

Start of Block: Team processes

Q68 **Factors relating to team processes.**
Your answers will not be fed back directly to the team, however they may be used to identify training needs across the network. Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q69 The project team worked well together.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q70 There were clear responsibilities for individuals: the work was shared across the team.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q71 Project was overly dependent on a particular individual or individuals.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q72 I believe that the team understood what the project was trying to achieve and that it would lead to improved processes and outcomes.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q73 There were rewards or incentives that supported engagement with, and continued delivery of, the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q74 The activities and roles of the initiative were incorporated into job descriptions.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q75 Staff had time within their working hours to complete the tasks of the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q76 The initiative had leadership and/or champions who were committed and capable.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q77 There was an appropriate balance of power between those involved with the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q78 Team members were able to express their opinions, and their opinions were valued.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q119 Insights or details relating to team dynamics and processes, and how these impacted on whether the initiative has become sustained and embedded:

_____

_____

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End of Block: Team processes

Start of Block: Participation

Q79 **Factors relating to ownership and involvement in the project.**
Please use the free text box at the bottom to help us understand any factors that you feel are particularly important.

Q80 There was a sense of ownership and commitment by those involved with the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q81 Staff who were responsible for delivering the initiative were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q82 The beneficiaries (patients/service users) were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q83 The community in which it was situated were involved as partners, and were able to shape the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q84 There was a collaborative network of people/organisations that helped to support and sustain the initiative.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q85 It felt as though the initiative was imposed on us and there was little sense of ownership or commitment to the project.

- ☐ Agree (1)
- ☐ Somewhat agree (2)
- ☐ Neither agree nor disagree (3)
- ☐ Somewhat disagree (4)
- ☐ Disagree (5)
- ☐ Don't know (6)

Q125 Insights or details relating to ownership or involvement in the project, and how these impacted on whether the initiative has become sustained and embedded:

_____

_____

_____

_____

_____

End of Block: Participation

Start of Block: End of survey

Thank you for taking part in this survey. If you have any questions please contact the lead researcher kathleen.leedham-green@kcl.ac.uk.

End of Block: End of survey

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

Page/line no(s).

Title and abstract

Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	4
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	2

Introduction

Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	4
Purpose or research question - Purpose of the study and specific objectives or questions	5

Methods

Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	5
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	5
Context - Setting/site and salient contextual factors; rationale**	5
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	5
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	5
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and	6

analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	
Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	6, 7
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	8
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	7
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	7
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	7,8

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	8-14
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Table 2 and 11-14

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	15-16
Limitations - Trustworthiness and limitations of findings	15

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	18
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	18

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014

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