



# City Research Online

## City St George's, University of London

**Citation:** Williams, S. & Radnor, Z. (2022). Moving from Service to Sustainable Services: A Healthcare Case Study. *International Journal of Productivity and Performance Management*, 71(4), pp. 1126-1148. doi: 10.1108/IJPPM-12-2019-0583

This is the accepted version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

**Permanent repository link:** <https://openaccess.city.ac.uk/id/eprint/25306/>

**Link to published version:** <https://doi.org/10.1108/IJPPM-12-2019-0583>

**Copyright and Reuse:** Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to [City Research Online policy](#).



**Moving from Service to Sustainable Services: A Healthcare Case Study**

Journal:	<i>International Journal of Productivity and Performance Management</i>
Manuscript ID	IJPPM-12-2019-0583.R2
Manuscript Type:	Standard Paper
Keywords:	healthcare, public service operations, Sustainability, Continuous Improvement, Services

SCHOLARONE™  
Manuscripts

## Moving from Service to Sustainable Services: A Healthcare Case Study

### Abstract

#### Purpose:

Worldwide, healthcare systems struggle to sustain the delivery of services at a time of increasing demand, limited resources and growing expectations from users. Coupled with dealing with the aftermath of the Covid-19 pandemic and the threat of other outbreaks. There has never been a more important time to sustain innovation and improvements. Using an illustrative case, we assess the application of two existing frameworks to identify the key propositions and dimensions required to deliver sustainable services.

#### Design/methodology/approach:

This illustrative case study focuses on a service provided by a chronic disease, multi-disciplinary community healthcare team in the UK. Experienced-based interviews were conducted with health professionals, patients and relatives to provide a rich account of a care pathway design. A high-level process map is used to visualise the key 'touch points'.

#### Findings:

We identify all seven propositions of the SERVICE framework being present along with additional dimensions relating to sustaining innovation and improvement.

#### Research limitations/implications:

This research is limited to a chronic disease care pathway. However, we believe the results could be applicable to other medical conditions, which are supported by a similar multi-disciplinary service model.

#### Practical implications:

We provide a sustainable public service operations SERVICES framework for health professionals and managers to consider when (re)designing care pathways.

#### Originality/value:

This research contributes to the emerging discipline of public service operations research by empirically testing for the first time the SERVICE framework within healthcare. We have included additional factors associated with innovation and improvement and recommended further development of the framework to include factors, such as economic sustainability, highly relevant to the context of universal healthcare systems.

**Keywords:** public service operations, healthcare, sustainability, improvement, service, innovation

## 1. Introduction

The ability to redesign sustainable services is paramount to the future delivery of effective and efficient healthcare worldwide. In the UK, this challenge coincides with policymakers and the public's fascination and possible anxieties of how public services are being delivered in times of uncertainty, particularly in light of the Covid-19 pandemic and the threat of other outbreaks. We argue that general operations management concepts, tasks and components are relevant to this sector but also, public sector organisations need to recognise that they are a service organisation and therefore need to engage with service operations management theory and frameworks. Operations management (OM) methodologies are 'context specific' and this means that the discipline needs to adapt, rather than dismiss, the context (Radnor and Osborne 2013). How this is achieved is not evident in the OM literature. Similarly, guidance for organisations to deliver sustainable services is variable.

The context of this case research is a community-led service for a chronic long-term disease delivered within a region of the UK. The aim of the paper is to assess the application of Osborne et al's (2015) SERVICE framework to progress our understanding of improving healthcare operations. We believe this is the first application of this framework within healthcare. This research is timely given healthcare systems globally are dealing with unprecedented levels of uncertainty. It is more important than ever that improvements and innovations in healthcare delivery of sustained. We have therefore extended the SERVICE framework to include dimensions of sustainable innovation and improvement as defined by Piercy and Brammer (2012).

We use an illustrative case to test the application of this new combined framework to identify the

1  
2  
3 key propositions and dimensions required to deliver sustainable services. This research also  
4  
5 makes an important practical contribution as healthcare professionals and managers endeavour to  
6  
7 (re)design and deliver sustainable services in what is a complex and challenging environment.  
8  
9

10  
11  
12 The remainder of this paper is organised as follows: the next section briefly discusses the  
13  
14 trajectory of service operations management research and the importance of public service  
15  
16 operations management. Then an overview of the original SERVICE framework and the  
17  
18 dimensions of sustainable of improvement is provided. The methodology section reports on the  
19  
20 design of the case research, followed by the results and discussion. The paper concludes with the  
21  
22 limitations of the study and opportunities for further research.  
23  
24  
25  
26  
27

## 28 **2. Trajectory of public service operations management**

29

30  
31 The discipline of operations management has its origins within manufacturing. However, with  
32  
33 the growth of the service industry came service operations. Periodically scholars call for more  
34  
35 operations management research in not-for-profit and Public Sector organisations (Karwan and  
36  
37 Markland 2006, Taylor and Taylor 2009), because increasingly the fragmented and inter-  
38  
39 organizational context of public services delivery (Haveri, 2006) necessitates asking new  
40  
41 questions about public services delivery. As a result, we have seen the introduction of  
42  
43 professional services followed by public service operations management (Radnor and Bateman,  
44  
45 2016). The emphasis on public services may have been fueled by the fact during the period of  
46  
47 2005 to 2011, both the UK and US, as well as other countries such as Greece and Portugal, have  
48  
49 experienced unprecedented financial crisis across public sector service which has led to severe  
50  
51 spending cuts. Given the recent Covid-19 global pandemic, it is likely this crisis will continue  
52  
53 as healthcare systems face the uncertainty of possible second waves of the pandemic and  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 the need to resume key services.  
4  
5  
6  
7

8 Such continual pressure on the western world public services has forced the need to reduce costs  
9 and increase efficiency. This has led to many organisations adopting private sector management  
10 concepts in order to improve their internal operations and processes. One area of public services  
11 operations management that has received more attention of late is healthcare. Studies have  
12 explored how approaches and techniques originating from manufacturing are applied within  
13 healthcare systems in order to improve health outcomes and the efficiency and effectiveness of  
14 care delivery (Henrique and Filho, 2020; Green, 2012). Froehle and Magazine (2012) propose  
15 operations management and operations research has a lot to offer healthcare operational decision  
16 making with direct benefits including reduced patient waiting times, better access to care and cost  
17 savings.  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

### 33 **3. Sustainability and improvement of public service operations** 34 35 36 37

38 The work of Osborne et al., (2015) builds the case for an integrated context for which public  
39 service organisations, such as healthcare organisations, to entrench sustainable business practice.  
40 In the development of the SERVICE framework, the authors eloquently review and comment on  
41 the last decade's emerging strand of public management theory. Although the scope of this paper  
42 is not to repeat this conversation, we do draw on their SERVICE framework (see figure 1)  
43 (Osborne et al., 2015), which embraces service-dominant logic rather than the product dominant-  
44 logic so often imposed on public and professional services (see Osborne et al., 2013).  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 The interest and implementation of quality improvement approaches has been one area of public  
4 service operations that has gained momentum over the past decade. This interest has spanned  
5 various sectors including Health (e.g. Brandao de Souza, 2009; Papadopoulos et al., 2011),  
6 Central and Federal Government (Richard 2008, Radnor, 2010) and, Local Government (Krings  
7 et al. 2006, Seddon and Brand 2008). Approaches have included Lean Thinking, Six Sigma,  
8 Business Process Reengineering (BPR), Kaizen and Total Quality Management as well as  
9 blended approaches such as Lean Six Sigma. Reviewing the trajectory of these approaches in  
10 healthcare confirms this rise in the use of quality improvement. For example, in 2010 a review of  
11 the use of business process improvement methodologies in the public sector reported 51% of  
12 publications focused on Lean, with 35% of these being in health services (Radnor 2010). In 2015,  
13 a review identified 243 articles associated with implementing lean in healthcare, with acute  
14 settings (hospitals) being the most prominent in the literature (D'Andreamatteoa et al., 2015). A  
15 more recent review of the use of Lean in healthcare identified 605 publications with 237 of these  
16 reporting on the implementation of Lean projects (Wackerbarth et al, 2020). From this latest  
17 review, the authors concluded there was low adherence to the tenets of Lean, which suggests  
18 issues with the fidelity of implementation and sustainability of improvements.

19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41 Some authors have reported on the mixed results of improving healthcare services (Proudlove et  
42 al., 2008; Radnor et al., 2012). Some reports have shown some encouraging signs, for example,  
43 Burgess and Radnor's (2013) study of English NHS Hospital Trusts reported a movement from  
44 project based improvement to more systemic change. However, they did question the  
45 sustainability of the improvements. Sustainability is the focus of this paper both in terms of the  
46 design of the service and the innovations and improvements made. We draw on two theoretical  
47 frameworks to analyse our healthcare case research. The SERVICE framework (Osborne et al.,  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 2015) focuses on the sustainability of public services and the second on improvement and  
4  
5 innovation (Piercy and Brammer, 2012).  
6  
7

#### 8 **4. SERVICE framework**

9

10 The role of the service-user in the design, delivery and evaluation of public services continues to  
11 gain attention among academics, practitioners and policymakers. Radnor et al (2014), among  
12 others, have argued for public services to move away from a product-dominant logic, where  
13 production and consumption are separated as discrete processes, to a (public) services-dominant  
14 logic where the service experience is placed at the centre of public services delivery (Osborne et  
15 al., 2015; Virtanen and Stenvall, 2014).  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25

26 Similarly, there has been a call for public sector organisations to move beyond the short-term,  
27 transactional approach to a relational approach. This emphasizes three elements: building  
28 system-wide relationships; understanding sustainability is strongly linked to the transformation of  
29 user knowledge; and professional understanding of the delivery process of public services is  
30 based upon co-production with service users (Osborne et al., 2015). Gronoos (2007) highlights  
31 in the case of services the production process is iterative and production and consumption occur  
32 concurrently. From an analysis of the new public management literature, Osborne et al (2015)  
33 develop a framework in which sustainable business models for a range of public services can be  
34 situated. This is the SERVICE framework, which consists of seven propositions: System,  
35 Environment, Relationships, Value, Innovation, Co-Production and Experience (see figure 1).  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

*Insert figure 1 about here*

1  
2  
3 Proposition one refers to public service organisations being part of complex service delivery  
4 **systems**. The ability to act as independent units is of limited value and there is a far greater need  
5  
6 for negotiated relationships to include policy makers, other public service organisations, service  
7  
8 users, citizen and other stakeholders (Osborne et al., 2014). The integrated governance of these  
9  
10 organisations is insufficient to support the level of integration needed for complex systems.  
11  
12 Healthcare organisations particularly face this challenge of operating within complex service  
13  
14 systems where many patients have comorbidities and complex needs. In the UK and elsewhere,  
15  
16 there are continual calls for better joined up healthcare services (e.g. The King's Fund, 2015;  
17  
18 Williams, 2017; Rechel, 2020).  
19  
20  
21  
22  
23  
24  
25

26 The second proposition considers the environment and how service organisations embrace and  
27  
28 **embed** organizational sustainability. The sustainability of individual organisations is a  
29  
30 prerequisite for the long-term survival of the wider system of public services (Osborne et al 2015).  
31  
32 In healthcare, this might refer to the sustained delivery of services within the acute (hospital) and  
33  
34 community settings. The introduction of intra-organisational networks (e.g. stroke and cancer  
35  
36 care networks) that bring these settings together is just one mechanism that might help to create  
37  
38 an environment conducive to embedding organizational sustainability. Other environmental  
39  
40 considerations are financial constraints and environmental regulations public service  
41  
42 organisations are required to balance.  
43  
44  
45  
46  
47  
48

49 The third proposition focuses on the importance of **relationships** within what is a knowledge-  
50  
51 driven sector. Technology is providing a platform in which the nature of relationships between  
52  
53 public sector organisations, politicians and service users is changing (Osborne et al., 2015).  
54  
55 However, the spread and proliferation of fragmented information systems remains (Okemiri et al  
56  
57  
58  
59  
60

2020). This challenge must be addressed as healthcare systems gradually transform into models of care that are digital and patient-centered. The presence of inadequate data integration at various levels incapacitates key activities such as operational planning, clinical decision-making and patient flow. There is a variety of existing information and communication technologies (ICTs) that can improve the quality and delivery of healthcare services (Gastaldi et al., 2012). One such example is the growing use of radio frequency identification (RFID) technologies with applications including:

- patient identification improving patient safety (Tseng et al., 2008);
- patient tracking used to track movements within a facility to improve the quality and timeliness of services (Swedberg, 2010) ;
- asset management to ensure the availability of critical equipment (Qu et al., 2011) and;
- medical treatment support with tagging of items such as drugs to endure accuracy of treatment processes (Sun et al., 2008).

There is also a need to move away from short-term transactional relationships (often used within product-dominant settings), (McLaughlin et al., 2009) to develop long-term relationships across service systems (McGuire, 2012). The majority of ‘public goods’ (whether provided by government, the non-profit and third sector or the private sector) are in fact not ‘public products’ but rather ‘public services’ that are integrated into people’s lives (Radnor and Bateman, 2016). A collaborative network of organisations, teams and individuals is needed to develop the communication and knowledge to aid seamless transition across this network. Healthcare services are often criticized for lack of coordination and joined up care (Parnaby and Towill, 2009; Sloan et al., 2014).

1  
2  
3 *Value* represents the fourth proposition. In the public management literature that has been some  
4  
5 discussion around whether the achievement of public value is an indicator of public service  
6  
7 effectiveness rather than internal measures of public service efficiency (e.g. Bekkers et al., 2011;  
8  
9 Benington and Moore, 2010). Osborne et al (2015) note this discussion is fundamental to  
10  
11 reforming public services. The desire to add value to the lives of citizens and service users is  
12  
13 critical to improving the delivery of existing services and the design of new services. Although  
14  
15 patient and public engagement has been on the agenda for many years within the NHS (UK) the  
16  
17 impact has been disappointing (Coulter, 2012). In particular, there has been a lack of focus on  
18  
19 engaging patients in their own clinical care, despite strong evidence that this could make a real  
20  
21 difference to health outcomes (Coulter, 2012). A useful addition to the discussion around co-  
22  
23 creating value comes from Black and Gallan (2015) who advocate healthcare service networks  
24  
25 can enhance communication and the co-creation of value. Such networks can include individuals,  
26  
27 groups or organisations (Vanden Bulte and Wuyts, 2007). However, understanding value, rather  
28  
29 than satisfaction, from the perspective of patients, relatives and health professionals remains  
30  
31 underdeveloped within healthcare. More recently, there has been a call for a broader  
32  
33 conceptualization of value (Black and Gallan, 2015) which includes a holistic definition of  
34  
35 wellbeing (e.g. emotional, physical and psychological health or life satisfaction (Ballantyne and  
36  
37 Varey, 2006).

38  
39  
40  
41  
42  
43  
44  
45  
46  
47 The fifth proposition refers to *innovation*, which is a critical factor for the development of  
48  
49 healthcare systems (Thune and Mina, 2016). Innovation in healthcare can be classified in three  
50  
51 ways: product innovation (e.g. medical devices); process innovation (e.g. redesign of patient  
52  
53 pathways or technologies to enable integration of health series) and organizational innovations  
54  
55 (e.g. new ways of working – interdisciplinary teams). Osborne and Brown, (2011) note that  
56  
57  
58  
59  
60

1  
2  
3 public service organizations need to support and develop innovation across the service system to  
4 ensure it is effective. For this to be achieved Osborne et al. (2015) propose three conditions to be  
5 present. First, the innovation needs to be externally focused to ensure that it adds value to service  
6 users rather than solely focusing on internal efficiency. Second, the service user needs to be  
7 involved in the process and production of the innovation (Skalen et al., 2014; Verma and  
8 Jayashima, 2014). Finally, governance rather than management is essential to the innovation of  
9 complex service systems. Proksch et al. (2019) argue innovation in healthcare has, in general, a  
10 positive effect on patient outcome and provide examples of healthcare innovation such as text-  
11 messaging and mobile-health behaviour change interventions, new process leading to reduction  
12 in unnecessary admissions and new generation of transcatheter heart valves. One response that  
13 has been adopted by around 150 general practices in England is a “telephone first” approach, a  
14 practice-wide change in which every patient asking to see a GP is initially phoned back by a GP  
15 on the same day (Newbould et al., 2017). It has been claimed this approach lowered the use of  
16 emergency departments by up to 20% and cost savings of about £100 000 per practice  
17 through prevention of avoidable attendance and admissions to hospital (NHS England,  
18 2013).

19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42 **Co-production** represents proposition six. Alford (2014) highlights often the lack of  
43 understanding of service management where the service user is rarely casted as the co-producer  
44 of public services, and is seen as the client of public service agencies. Where possible, users  
45 should be able to manage their own journey with providers, commissioners and regulators.  
46 Perhaps more accurately for healthcare, Osborne et al., (2016, p640) define co-production as ‘the  
47 voluntary or involuntary involvement of public service users in any of the design, management,  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 delivery, and/or evaluation of public services'. There is a continuum of perspectives on co-  
4 production which includes user involvement being 'added into' the operational process of service  
5 delivery to higher levels of co-production due to the consumption and production of the service  
6 taking place at the same point (Osborne et al., 2015). There is still much debate over what  
7 constitutes co-production and the challenges associated with power relations and questions of  
8 representation/inclusivity (Palmer et al., 2018; Williams and Caley, 2020).  
9

10  
11  
12  
13  
14  
15  
16  
17  
18  
19 There is a growing body of literature on coproducing healthcare services and to some extent may  
20 be leading the way, particularly in Mental Health Services. Traditionally, healthcare services  
21 have recognized the need for some kind of partnership with patients. For example, in the US the  
22 Center for Medicare Services identifies patient and family engagement as a pillar in its efforts to  
23 improve healthcare (McCannon and Berwick, 2011). Similarly, in social care participatory  
24 delivery of services is actively sought by policy makers (Cayton, 2004; Needham and Carr, 2009).  
25  
26 Coproduction is featured in the literature within the context of improving healthcare systems (e.g.  
27 see Batalden et al., 2016; Filipe et al., 2017; Kaehne et al., 2018) and is seen as a model of  
28 service delivery, which should have a positive impact on service users (patients) and on the wider  
29 social system (Realpe and Wallace, 2010). Black and Gallan (2015) extend this discussion to  
30 emphasise the importance of organisations within the healthcare system (also referred to a  
31 network) to engage with one another to enhance patient well-being and quality of life and to co-  
32 create value with the patient/customer. The final proposition builds on these collaborative efforts  
33 by capturing the knowledge from across the healthcare system in order to improve the service  
34 *experience* and to ensure improvements are sustained (Lusch and Vargo, 2006; 2014). Table 1  
35 summaries the theoretical propositions.  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 *Insert table 1 here*  
4  
5  
6  
7

## 8 **5. Sustainable SERVICE innovation and improvement**

9

10 In addition to the SERVICE framework, we note here the important link between innovation,  
11 improvement and sustainability. Piercy and Rich (2015) provide a useful description, which we  
12 believe can be assessed within the realms of public services. Although their discussion sits  
13 largely within manufacturing, it does encourage us to go beyond the confines of improvement  
14 and environmental sustainability, the place where much of this work has focused (e.g. Pil and  
15 Rothenberg, 2003; Kleindorfer et al., 2005). Conducting a meta-analysis of several hundred  
16 studies, Piercy and Brammer (2012) identified six dimensions related to innovation, improvement  
17 and sustainability: environmental; workforce; supply chain; community; governance and quality  
18 issues (see table 2).  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32

33 *Insert table 2 here*  
34  
35  
36  
37

38 Considering these sustainable improvement dimensions in light of the SERVICE framework, we  
39 draw some similarities between the two approaches (see table 3). First, the whole systems  
40 approach is common to the supply chain context required for sustainable improvement. The  
41 reference made to embedding organizational sustainability for the short and long-term needs to  
42 encompass environmental issue along with arrangements for governance and quality  
43 improvement. Long-term relationships are central to both the SERVICE framework and the  
44 sustainability dimensions, which may extend across the organisation, supply chain and the wider  
45 community. Similarly, the ability to deliver and sustain public value again requires collaborative  
46 working. Innovation to achieve service effectiveness can occur in several ways including  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

environment, supply and quality improvements along with new working practices and technologies. Coproduction of a service requires service-user involvement, which may be concomitant to the wider community depending on the service being offered. Finally, the knowledge creation and mobilization required to enhance the service experience can be linked to the internal and external supply chain. Clearly organizational and supply chain structures and governance need to be in place to aid shared learning and decision-making.

*Insert table 3 here*

As there are similarities between the SERVICE framework and the dimensions of sustainable innovation and improvement, we employ both approaches in our illustrative case to enable us to assess sustainability in the widest sense.

## 6. Methodology

To test the application of this combined approach, we engaged with a multi-disciplinary specialist team, which was developed to deliver services within the community for patients diagnosed with Huntington's disease (HD). There are between 6,000 and 8,000 people within the UK living with HD (HD Association, 2012). It is a hereditary disorder of the central nervous system and usually develops in adulthood and can cause a very wide range of symptoms. The trajectory of care varies for each patient although the HD Association (HDA) has identified the types of specialisms and services that HD patients are likely to need to access.

An illustrative case study (McNulty and Ferlie, 2002) was employed, as this design is suitable for

1  
2  
3 testing of new frameworks and where a limited body of evidence exists (Meredith et al. 1998)  
4  
5 often within an under researched setting (Pitchforth et al, 2017) in this case healthcare. The  
6  
7 research lends itself to an exploratory approach and an inductive methodology to allow the  
8  
9 building of theoretical insights (Yin, 2014) into the sustainability of service design and  
10  
11 improvement and innovation activity.  
12  
13  
14  
15  
16

17 Our illustrative case study focused on a community based HD service within one region of the  
18  
19 UK. The case study and participants were purposively selected based on the criteria shown in  
20  
21 table 4. The HD multidisciplinary community team consisted of a psychologist, nurse,  
22  
23 occupational therapist, physiotherapist and a speech and language therapist. Staff participants  
24  
25 were invited to participate in the study by email which included the information sheet. All  
26  
27 members of the team participated in the study.  
28  
29  
30  
31  
32

33 The HD Team lead identified twelve patients and their relatives to join the study. Service user  
34  
35 participants needed to have been accessing the service for at least six months. Details of the  
36  
37 study were provided to patients and relatives by the lead of HD team. Contact was made by  
38  
39 telephone with those that expressed an interest to take participate in the study. All participants  
40  
41 needed to be able to provide consent to take part in the study.  
42  
43  
44  
45  
46

47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
*Insert table 4 about here*

49 Experience-based, in-depth semi-structured interviews were conducted with all the healthcare  
50  
51 professionals within the HD team (n=5). Of the twelve patients invited to participate in the study  
52  
53 three agreed along with six relatives/carers. All interviews conducted were face-to-face and  
54  
55 audio recorded. We recognize the limited number of participants within the study; therefore, to

1  
2  
3 validate the results these shared anonymously with a wider group of HD patients and relatives  
4  
5 when attending family group meetings.  
6  
7  
8  
9

10 The duration of the interviews was between 30 and 60 minutes and all were audio recorded with  
11 the consent of the interviewees. Interviews took place in the interviewee's home (patient and  
12 relatives) or place of work (healthcare professionals). The main aim of this study was to test the  
13 application of SERVICE propositions and improvement/innovation dimensions to enable us to  
14 assess if the HD care pathway is sustainable. To gain an in-depth understanding of how the care  
15 pathway is operationalised we asked the interviewees to recall their experiences of either giving  
16 or receiving care. Healthcare professionals were asked about their roles within the pathway,  
17 when and how the service was introduced, how the service is delivered and evaluated and any  
18 recent changes made. Patients and relatives were asked to share their experiences of receiving  
19 care from the HD team and other providers. All interviews were transcribed verbatim. A two-  
20 stage approach was used to analyse the data:  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34

- 35 1. Interview data documenting the experiences of staff, patients and relatives were  
36 triangulated and analysed to produce a high-level process map of the service (see figure 2).  
37 This map was validated with members of HD family group to confirm the service design  
38 and any recent or required innovations and improvements.  
39  
40  
41  
42  
43
- 44 2. An inductive thematic analysis of the interview data was also conducted using King's  
45 (1998; 2004) thematic framework. This approach encourages an iterative process where  
46 the coding framework develops as interviews are analysed. Themes were matched against  
47 the propositions of the SERVICE framework and dimensions of sustainable innovation  
48 and improvement (see table 5). Additional areas associated with service delivery and  
49 improvement were included in the coding framework.  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3  
4  
5 Extracts from the interviews are included in the analysis to illustrate the experiences of those  
6  
7  
8 delivering and receiving care.  
9

10  
11  
12 *Insert table 5 here*  
13

## 14 **7. Results and discussion**

15  
16  
17  
18  
19 A high-level process map (see figure 2) was constructed, which identifies the interventions and  
20  
21 touch points within the Huntington's disease (HD) patient pathway. The map provides a  
22  
23 roadmap of the patient journey and identifies the different stakeholders involved in delivering  
24  
25 care and services for HD patients. It is likely, in the UK, there are regional and national variations  
26  
27 depending on how HD services are commissioned. However, the map illustrates the key 'touch  
28  
29 points' for those involved in receiving and giving care which is helpful for our discussions  
30  
31 around the sustainability of the service. Touch points relate to the key stages of transition within  
32  
33 a patient pathway usually from referral to treatment (or care management) whether in a hospital  
34  
35 or community setting (Williams and Radnor, 2017). From our research, we know that not all HD  
36  
37 services are provided by community-based multi-professional teams as in our case research, and  
38  
39 therefore this might be seen as an exemplar service.  
40  
41  
42  
43  
44  
45  
46

47 *Insert Figure 2 here – High-level process map of HD patient care pathway*  
48  
49  
50

51 From our analysis, we were able to identify all seven propositions of the SERVICE framework,  
52  
53 with some more prominent than others. The multi-professional, user-centred approach to the  
54  
55 design and delivery of the HD service has presented an innovative and sustainable approach.  
56  
57  
58  
59  
60

1  
2  
3 Here we examine each proposition in turn by synthesizing our data and including extracts from  
4 the interviews where appropriate.  
5  
6  
7  
8  
9

10 The first SERVICE proposition refers to the notion public services are not just organizations but  
11 are in fact *systems* and need to be governed as such. From the interviews with the HD health  
12 professionals, it was evident that their work expanded well beyond the clinical interventions  
13 required by their patients. The team is responsive to what is required to keep the patient  
14 functioning and living an independent life where possible. The flexibility of the team is a key  
15 attribute as one staff interviewee noted, “we go wherever the patient is, this can be their home,  
16 nursing home, day care unit or hospital.” The span of communication extends across  
17 organizational and professional boundaries, but interestingly this is not dependent on  
18 technological solutions. The multi-professional roles of the team enable them to provide an  
19 integrated service which includes outreaching and working collaborating with a spectrum of  
20 health and social services. Often this means participating in activities such as form-filling,  
21 accompanying patients and relatives to interviews and meetings, and making telephone calls on  
22 behalf of patients and relatives, as one relative interviewee remarked, “they’ve been so much help  
23 with all this paperwork because I’d be no good at it”. Another patient interviewee recounted the  
24 difficulties of getting rehoused and how the team assisted him “I was on it (the council housing  
25 list) for two years.. and still heard nothing, then [name of team member] got involved and we  
26 applied again .. it was three months and everything was done.”  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43  
44  
45  
46  
47  
48  
49  
50

51 The HD team operate well-beyond the boundaries of their professional roles and collectively  
52 provide information and assistance that helps their patients remain independent for as long as  
53 possible and to make the transition across the various agents within the health and social care  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 system/network as seamless and well integrated as possible. This level of interaction across the  
4  
5 different services enables the HD team to optimize their service provision and effectively engage  
6  
7 in value co-creation with their patients (Black and Gallan, 2015).  
8  
9

10  
11  
12 The weekly HD team meeting is also integral to enabling this system/network approach to be  
13  
14 managed and sustained. Collectively the team is able to draw on their shared experiences and  
15  
16 knowledge to ensure signposting is up-to-date and accurate. Blurring of the different  
17  
18 professional roles is inevitable to enable the team to be responsive to patient and family needs. As  
19  
20 one staff interviewee noted “If it was say an occupational therapy referral but xxxx is inundated  
21  
22 with work for three weeks or so, again, we would make that multi-disciplinary decision. The  
23  
24 team meeting is fundamental to ensuring clarity around responsibilities and information sharing.  
25  
26  
27  
28  
29

30  
31 The second proposition is the need to develop an *environment* conducive to organizational  
32  
33 sustainability both in the short and long term. One area this relates to is the need to maintain the  
34  
35 employment of the staff and managers. Here our unit of analysis is the patient pathway and  
36  
37 central to this as noted above is the multidisciplinary working by the team. All the HD team  
38  
39 members had been in their roles for at least 2 years. The team lead had been in post for  
40  
41 approximately 7 years, shortly after the team’s inception. The maturity and experience of the  
42  
43 team assists in creating a stable environment and embedding the service within the wider  
44  
45 organization. One staff interviewee noted, “the professions of the team are carefully selected to  
46  
47 reflect the needs of our patients and their families. We review this regularly to ensure that we  
48  
49 have the right skills.”  
50  
51  
52  
53  
54  
55

56 The other element of sustainability to be considered is (health) service sustainability, in particular  
57  
58  
59  
60

1  
2  
3 the need to move away from service silos to create an integrated service. To some extent, the  
4 multi-disciplinary nature of the team and the collaborative working environment has enabled  
5 them to blur the professional boundaries that might be more evident in clinical teams. For  
6 example on staff interviewee noted how any member of the team can undertake the initial  
7 assessment "...to respond more quickly, somebody else would go out and do the core assessment.  
8 And then the assessment process would start". The wider integration across the health and social  
9 care system (network) probably requires further examination. It is evident members of the team  
10 are acting as 'brokers or boundary spanners' (Long et al., 2013) to bridge organizational  
11 boundaries and ensure consistency of service delivery. Continually negotiating the access to  
12 services on behalf of patients along with ensuring client information from other providers is  
13 current and informative. This often extends to accompanying patients and relatives to interviews  
14 and meetings to enable them to access support (e.g. accessing care in the community) across the  
15 wider health and social care system. Often this support can extend to the wider public service  
16 system (e.g. housing, education, benefits) which can assist the general wellbeing and independent  
17 living of patients and their relatives. Several of the patient and relative interviewees spoke about  
18 receiving help with obtaining bus passes and disabled badges and in one case access to financial  
19 support and benefits.  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42  
43

44 The third proposition requires the development of long-term *relationships* across the service  
45 system rather than seeking short-term transactional value. The progressive nature of HD requires  
46 patients and their families to seek support at various points of the disease trajectory. It is difficult  
47 to predetermine what support will be required and when due to the complexity of the condition.  
48 However, given the stability of the team membership it has allowed good relationships to be  
49 developed with their patients/relatives. One relative interviewee stated how she and members of  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 her family had developed strong relationships with the team and how the team was usually her  
4 first port of call when seeking advice. Similarly, as the team liaises with other service providers  
5 such as social care they are also developing good relationships across the care supply chain. One  
6 relative interviewee stated the *“team is so ... experienced and familiar with individuals and with  
7 the whole general situation, and with all the social issues, we have very little contact with our GP  
8 regarding HD.”* Another staff interviewee referred to the good relations with other service  
9 providers *“we’ve got good relationships actually, we’ve got very good relationships with local  
10 Social Services, and I think again, because our patients have got you know, it’s a longstanding  
11 disease, those relationships build up over time, so you get to know the social worker, they get to  
12 know you.”* The development of these relationships is dependent on local knowledge of services  
13 and hence any changes of personnel within these services need to be communicated. Staff  
14 interviewees mentioned the necessity of being kept informed of any changes in service provision  
15 or staff to ensure quick and reliable access to appropriate assistance for their users. The formal  
16 communication channels to update changes within the system were reported as often being too  
17 bureaucratic and slow to react, hence the teams’ reliance on more informal relations that are  
18 developed at a local level.  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41

42 The development of new technologies and digital platforms within healthcare is reported to have  
43 created interesting opportunities for e-health and connect users, experts and practitioners (Presti  
44 et al., 2019). Yet for the HD team the interface between IT systems is often problematic even  
45 within a community and acute setting of the same organisation (Okemiri et al 2020). All of the  
46 health professionals’ interviewees spoke of their frustrations and called for the development of  
47 better Information Systems to support the communication required by these system-wide  
48 relationships.  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3  
4  
5 Proposition four promotes the need for internal efficiency (e.g. quality improvement) and the  
6 ability to have an outward-facing focus on *value*. The HD team meets weekly to review the needs  
7  
8 of their existing patients and any new referrals that have been received. All of the health  
9  
10 professional interviewees thought this face-to-face meeting was central to being able to respond  
11  
12 quickly to the needs of their patients and families. As noted above, the team link regularly with  
13  
14 other agencies and service providers to ensure that their patients are able to access services.  
15  
16 Sometimes this will involve accompanying the patient to a meeting and other times it will require  
17  
18 signposting to available resources. The HD team is continually updating their knowledge of new  
19  
20 services and provision within their geographic area. Periodically, the team review their internal  
21  
22 systems and procedures to look how they might improve the efficiency and effectiveness of their  
23  
24 service. One area that we feel is notable for its omission is economic sustainability, which is a  
25  
26 lens in which to view value. Given the pressures highlighted in the early part of this paper, we  
27  
28 feel this should not be overlooked within the context of sustaining services in healthcare and the  
29  
30 need to deliver economic value. The notion of value-based healthcare encourages us to consider  
31  
32 how well resources are allocated based on need and how well the resources are used to serve  
33  
34 those in need (Gray, 2017). Interestingly this HD team has been able to protect its funding since  
35  
36 its inception ten years ago. However, the team lead did emphasize the difficulties in doing so and  
37  
38 the need to demonstrate the value they bring to patients and relatives and the wider healthcare  
39  
40 community. The team is continually promoting their services to general practices, social services  
41  
42 and other providers. The ability to demonstrate effective use of resources, the service quality and  
43  
44 financial gains is becoming more important. The effective use of resources is constrained by the  
45  
46 capacity of the team. The patient and family group is one mechanism in which to gather  
47  
48 information on service quality. The ability to show financial savings is more difficult as it is not  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 always clear when the team has prevented an admission to acute (hospital) services.  
4  
5  
6

7  
8 The fifth proposition relates to *innovation* as a means through which to achieve service  
9  
10 efficiency and effectiveness. Osborne et al., (2015) note this innovation needs to be open and  
11  
12 collaborative. Working closely with patients, relatives and various other stakeholders within the  
13  
14 community encourages the HD team to be externally focused. The monthly patient and relative  
15  
16 support group the team recently introduced is a mechanism in which they can continually monitor  
17  
18 whether their services are delivering what is important to their patients and relatives. The ability  
19  
20 to undertake other innovations in relation to communication and access to information was  
21  
22 constrained by the wider health and public service system. The interface of IT systems within  
23  
24 and outside of the healthcare organization was limited and required regional or national  
25  
26 investment. Examining the provision of HD services across the UK it is permissible to say that  
27  
28 having a dedicated multi-disciplinary team is an innovation as this is not a service widely  
29  
30 available to all HD patient and their families.  
31  
32  
33  
34  
35  
36

37  
38 Technological innovations appeared to be somewhat limited. The team's open referral system  
39  
40 was largely reliant on letters, email and telephones. As one staff interviewee described how  
41  
42 referrals were processed by the team "*.. phoning the referrer, perhaps ringing the patient, getting*  
43  
44 *as much information as possible, and then we would look at booking in an appointment, that*  
45  
46 *would either be via the telephone or that would be via letter."* Some members of the team were  
47  
48 able to introduce technological solutions to aid communication. Patients and relatives provided  
49  
50 examples of using IT particularly those attending the family groups. These included the setting  
51  
52 up of Facebook pages and WhatsApp groups as a way of keeping in touch outside of the  
53  
54 meetings.  
55  
56  
57  
58  
59  
60

1  
2  
3  
4  
5  
6 **Co-production**, in the context of this framework, is reported to be the source of effective  
7 performance and innovation in public services. From the interview data and the high-level map  
8 (figure 1), it is evident that the patient and their relatives are central to the HD service. Initially  
9 the front part of the process focuses on referrals into the system. Once the team receives a  
10 referral, the appointment of a named care coordinator is made for each patient. From this point,  
11 services and interventions are ‘pulled’ towards the patient depending on their needs. “..that’s  
12 where we’re lucky as a team, in that we’ve got that flexibility to be able to respond, as and when,  
13 but also to make our interventions appropriate really to what the patient’s needs are” (Staff  
14 interviewee). Another noted her role was about “..empowering people to make their own choices.”  
15  
16 The care coordinator supports the patient in getting access to other professions and services that  
17 will assist in independent living and enhancing quality of life. A member of the team commented  
18  
19 “So I, as care coordinator then, would be responsible for pulling in the relevant people, for  
20 notifying the GP, the referrer, of what has happened to date. And then also I would be  
21 responsible for reviewing that person and that generally ... it is patient specific, you know as in  
22 what their needs are”.

23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41  
42 Recently the team has introduced patient and family support groups, which again ensure that the  
43 patient’s voice is central to the design of services. These groups provide the opportunity for open  
44 discussions on how services might be improved and more specifically to share experiences of  
45 those living with HD. Positive experiences for patients and families such as these create  
46 opportunities for more engaged efforts over time and the chance to access important resources  
47 and engage in more value co-creating behaviours (Black and Gallen, 2015).  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 The seventh and final proposition of the original framework is knowledge, which is seen as a key  
4 resource to deliver service *experience*. Understanding service user expectations and the level of  
5 service delivery in which to satisfy those expectations are key areas of knowledge that needs to  
6 be developed. Knowledge also may be known just within the organization (also referred to as  
7 ‘sticky’ knowledge) and something that needs to be acquired in order to do the job/role. In  
8 relation to the HD team, the generation and sharing of ‘sticky’ knowledge was apparent from the  
9 healthcare professionals. For example, sharing knowledge of contacts within local services and  
10 charities was important for service provision and the development of new team members.  
11 Having regular face-to-face team meetings supported by other forms of communication e.g. email,  
12 telephone were important to all the HD team members. One team member indicated weekly team  
13 meetings were crucial to being able to respond to patients’ needs. Frequent patient-relative group  
14 meetings have also ensured service-users are central to the service. One relative/carer  
15 interviewee noted how she could be herself at the group meetings and how she does not feel  
16 judged as other member will have experienced something similar.  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37

38 The summary table (table 6) below illustrates examples of how the propositions of the SERVICE  
39 framework and the six dimensions of sustainable improvement are present within the HD service.  
40  
41  
42  
43

44 *Insert table 6 here*  
45  
46  
47  
48

49 Reflecting on our analysis of the SERVICE propositions and the innovation and improvement  
50 dimensions in relation to our case research there is a need to comment on how some were more  
51 prominent than others. This observation may reflect the context of the research (e.g. HD service)  
52 or the growing maturity of public sectors with the field of (service) operations management and  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 the sustainability of services. First, the systemic working of the team was certainly prominent in  
4  
5 our data. Collectively the HD team has considerable knowledge of the wider health and social  
6  
7 care system/network and were actively able to support and signpost their patients. In this  
8  
9 brokering role, they are able to transfer and transform information so it is meaningful for their  
10  
11 patients and relatives. The development of good relationships was evident not only within the  
12  
13 team and the wider health and social care community but also with their patients and relatives,  
14  
15 The nature of this chronic long-term disease often requires sustained support to enable long-term  
16  
17 relationships to be developed with the families. This family-centred approach enables greater  
18  
19 opportunities for involvement with patients and their families and the ability to co-create value  
20  
21  
22 (Black and Gallan, 2015).  
23  
24  
25  
26  
27

28 The experience and maturity of the team was another key determinant in this case. There has  
29  
30 been little turnover of staff since its inception. Any expansion of the team has been managed  
31  
32 carefully through various mechanisms (e.g. weekly team meetings, coaching and mentoring,  
33  
34 connections with local services) which have helped to share the family-centred ethos the team has  
35  
36 developed along with the 'sticky' knowledge acquired from working alongside the families and  
37  
38 other services involved in their care.  
39  
40  
41  
42  
43

44 One of Piercy and Brammer's (2012) dimensions, *workforce* (which we term *staff*), we feel is  
45  
46 worthy of further discussion. It is important to note, in this case research, the HD team perform  
47  
48 generic and professional roles. The care-coordinating role enables the pooling of team capacity  
49  
50 to ensure contact is made with new patients as soon as possible. Similarly, the coordinator 'pulls  
51  
52 in other professions as and when required by the patient or relatives. Given the importance of the  
53  
54 integrated working and multi-disciplinarity of the HD service, representation of staff requires  
55  
56  
57  
58  
59  
60

1  
2  
3 greater emphasis in sustaining of services. This is pertinent given the retention and attrition issues  
4  
5 facing the UK healthcare system, where there is greater acuity for community based services  
6  
7 (Buchan et al., 2019). We therefore propose staff as an additional proposition within the  
8  
9 SERVICE(S) framework.  
10  
11  
12  
13

## 14 **8. Conclusion**

15  
16  
17  
18  
19 The overall aim of this paper was to test the application of the SERVICE framework and the  
20  
21 innovation and improvement dimensions within the context of healthcare services, and more  
22  
23 specifically within a community setting. Our case fits the typical characteristics of a  
24  
25 professional/public service as being high customer interaction, high customisation and high  
26  
27 labour intensity (Schemmer, 1986). Using healthcare we have assessed the combined framework  
28  
29 to reflect the specific context of a multi-professional, family centred, community based HD  
30  
31 service.  
32  
33  
34  
35  
36

37  
38 To the best of our knowledge, this is the first time the original SERVICE framework has been  
39  
40 tested within a healthcare setting. In addition, this paper extends combines this framework with  
41  
42 dimensions of sustainable improvement and innovation to provide a new SERVICES framework.  
43  
44 We have identified that economic sustainability needs to be more prominent when assessing  
45  
46 healthcare services particularly in periods of uncertainty which many universal healthcare  
47  
48 systems are experiencing for various reasons including the recent coronavirus pandemic. As we  
49  
50 have noted, such situations also create opportunities for the innovation and improvements which  
51  
52 may need to be sustained beyond the pandemic.  
53  
54  
55  
56  
57  
58  
59  
60

1  
2  
3 Although our case results are limited to the pathway of one chronic long-term condition, we  
4 believe there are general points of learning to other medical conditions where services are  
5 primarily located outside of the acute (hospital) setting. Here our unit of analysis is a patient care  
6 pathway provided by a specialized community-based team (rather than organization) but we  
7 believe this still has relevance. The Huntington's disease (HD) case in this study could be viewed  
8 as an exemplar particularly due to the multi-disciplinary nature of the team, and given the push  
9 towards integrated services in health and social care we feel this is an appropriate 'test'.  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20

21 For our case, some framework propositions and dimensions were more evident than others, for  
22 example, there is a strong presence of understanding value, developing long-term relationships  
23 and co-producing services. This partially relates to the degenerative nature of the disease but also  
24 to the design of model of care (e.g. disease specific, multi-disciplinary and community-based).  
25 The strengthening of other propositions and dimensions is possible in particular technology to  
26 support interaction with families and other services in particular. Innovations in technology  
27 seemed to be driven by families. The case does demonstrate process innovation in the way the  
28 team is able to adapt their service to the changing needs of their patients and relatives.  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40  
41

42 We propose there is one additional dimension (staff) that requires attention, particularly given the  
43 retention issues facing many healthcare providers in the UK. Following this empirical research in  
44 healthcare the public service sustainable framework – SERVICES framework - we propose is  
45 shown in figure 3.  
46  
47  
48  
49  
50  
51  
52  
53

54 *Insert figure 3 here*  
55  
56  
57  
58  
59  
60

1  
2  
3 The SERVICES framework encourages those designing, evaluating or managing services to  
4 review the extent to which each proposition/dimension is present. In healthcare, there is a need  
5 to have a clearer understanding of service design and categorization of service attributes in order  
6 to identify sustainable improvements and innovations. In particular, this framework helps to  
7 highlight those propositions/dimensions that seem to receive less attention. For example,  
8 understanding value in healthcare often is considered the same as measuring patient satisfaction.  
9 Value needs to be clearly defined and care pathways need to be improved based on the  
10 knowledge and clinical expertise of care providers and the preferences and needs of patients  
11 (Poksinka et al., 2016). Similarly, the scope for innovation needs to expand beyond technology  
12 and product innovation. Often to embed new technologies, process innovation needs to occur.  
13 The SERVICES framework is designed to support this shift in thinking. The addition of staff is  
14 an important addition as sustainable improvements will be dependent on appropriate use of  
15 resource and investment in skills and competencies to review service design, assess service  
16 attributes and identify opportunities for the introduction of innovations and sustained  
17 improvements.

18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
33  
34  
35  
36  
37  
38  
39  
40 We opened our paper stating public sector organisations need to recognise themselves as service  
41 organisations and engage with service operations management theory and frameworks. Here we  
42 have further developed a framework that is specific to service organisations. It offers some  
43 clarity and guidance on the key dimensions and propositions in relation delivering sustainable  
44 services, an area that is not well understand within the literature. Further research is needed  
45 however to contextualize the new SERVICES framework in healthcare and other service settings.

46  
47  
48  
49  
50  
51  
52  
53  
54  
55  
56 Our study has shown, from the illustrative HD case, it is possible to identify examples of service  
57  
58  
59  
60

1  
2  
3 design and practice that demonstrate sustainability and improvement. Extending the research  
4  
5 beyond care pathways to different levels of the healthcare system would be helpful e.g.  
6  
7 organization and system/network, along with different health and social care settings. Because of  
8  
9 the Covid-19 pandemic, we have seen many examples of innovation at various levels and scale  
10  
11 (e.g. building of field hospitals within weeks). Repurposing of theatres for use as intensive care  
12  
13 units and online GP consultations are some examples of operational redesign. Some of these  
14  
15 improvements and innovations will need to become the new way of working. We propose our  
16  
17 SERVICES framework will provide a model for academics and managers in which to assess  
18  
19 service design and opportunities for sustainable improvement and innovation.  
20  
21  
22  
23  
24  
25

26 More generally, this study has identified further research needs to continue to unpack the  
27  
28 relevance of operations management frameworks such as design, planning and control, operations  
29  
30 strategy, innovation and improvement. Here we have focused on the design, innovation and  
31  
32 improvement of sustainable public services. Other frameworks need to be considered within this  
33  
34 context. Studying public service operations provides the opportunity for theory building  
35  
36 particularly through the rich data provided by qualitative case studies and will help to provide a  
37  
38 greater insight into the operational effectiveness required of public services (Esain et al., 2016).  
39  
40  
41  
42  
43

44 The implications of the study are twofold. First, for managers and healthcare professionals, we  
45  
46 have operationalised the seven propositions of the original SERVICE framework and the six  
47  
48 dimensions of sustainable innovation and improvement to provide valuable insight for those  
49  
50 charged with designing and delivering sustainable healthcare services. The framework provides  
51  
52 guidance on the critical factors such as understanding value, supply chain and environmental  
53  
54 dimensions of improvement that are often overlooked or less evident when improving healthcare  
55  
56  
57  
58  
59  
60

1  
2  
3 services. We have also emphasized the important role of staff in the delivery of sustainable  
4  
5 services and advocate for periods of stability in which teams can identify and implement  
6  
7 improvements and innovations.  
8  
9

10  
11  
12 Earlier we called for public sector organisations to recognise they are service organisations and to  
13  
14 engage with service operations management theory and frameworks. It is the role of scholars to  
15  
16 continue to develop and test these theories and frameworks in different service environments.  
17  
18 Here we have contributed to this research agenda by taking a wider perspective on sustainability,  
19  
20 which has resulted in the SERVICES framework.  
21  
22  
23  
24  
25  
26

## 27 **References**

- 28  
29 Alford, J. (2014), “The multiple facets of co-production: building on the work of Elinor Ostrom”,  
30  
31 *Public Management Review*, Vol. 16, pp. 299–316.  
32  
33  
34 Ballantyne, D. and Varey, R. (2006). “Creating value-in-use through marketing interaction: The  
35  
36 exchange logic of relating, communicating and knowing”. *Marketing Theory*, Vol. 6, No. 3, pp,  
37  
38 335–348.  
39  
40  
41 Bamford, D. and Griffin, M. (2008), “A case study into operational team working within a UK  
42  
43 hospital,” *International Journal of Operations & Production Management*, Vol. 28, pp. 215–  
44  
45 237.  
46  
47  
48 Batalden, M. Batalden, P. Margolis, P. Seid, M. Armstrong, G. Opiari-Arrigan, L. and Hartung,  
49  
50 H. (2016), “Coproduction in health care”, *BMJ Quality & Safety*, Vol. 25, No. 7, pp. 509-517.  
51  
52 Bekkers, V. A. Edwards, R. Moody and Beunders, H. (2011), “Caught by surprise? Micro-  
53  
54 mobilization. New media and the management of strategic surprises”, *Public Management*  
55  
56  
57  
58  
59  
60

1  
2  
3 *Review*, Vol. 1, No. 1, pp. 1003–1022.

4  
5 Benington, J. and Moore, M. (2010), *Public Value: Theory and Practice*. Palgrave Macmillan,  
6  
7 Basingstoke.

8  
9  
10 Black, H and Gallan, A. (2015), “Transformative service networks: cocreated value as well-  
11  
12 being”, *The Service Industries Journal*, Vol. 35, No. 15-16, pp. 826-845.

13  
14 Boozeman, B. (2002), “Public-value failure: when efficient markets may not do”, *Public*  
15  
16 *Administration Review*, Vol. 62, pp. 145-161.

17  
18 Brandao de Souza, L. (2009), “Trends and approaches in lean healthcare”, *Leadership in Health*  
19  
20 *Services*, Vol. 22, No. 2, pp. 1

21  
22  
23 Buchan, J. Charlesworth, A. Gershlick, B. and Seccombe, I. (2019), *A critical moment: NHS*  
24  
25 *staffing trends, retention and attrition*, The Health Foundation: London.

26  
27 Burgess, N., and Radnor, Z. (2012), “Service improvement in the English National Health  
28  
29 Service: Complexities and tensions”, *Journal of Healthcare Management and Organisation*,  
30  
31 Vol. 18, No. 5, pp. 594-607.

32  
33 Burgess, N. and Radnor, Z. (2013), “Evaluating Lean in Healthcare”, *International Journal of*  
34  
35 *Health Care Quality Assurance*, Vol. 26, No. 3, pp. 220-235.

36  
37 Coulter, A. (2012), *Leadership for patient engagement*, The Kings Fund, London. Available at  
38  
39 [https://www.kingsfund.org.uk/sites/files/kf/leadership-patient-engagement-angela-coulter-](https://www.kingsfund.org.uk/sites/files/kf/leadership-patient-engagement-angela-coulter-leadership-review2012-paper.pdf)  
40  
41 [leadership-review2012-paper.pdf](https://www.kingsfund.org.uk/sites/files/kf/leadership-patient-engagement-angela-coulter-leadership-review2012-paper.pdf) [Accessed 20<sup>th</sup> July 2020].

42  
43  
44 Cayton, H. (2004), “*Patient-engagement and patient decision-making in England*”, Paper  
45  
46 presented at the Improving Quality of Health Care in the United States and the United  
47  
48 Kingdom: Strategies for Change and Action.

49  
50 D’Andreamatteoa, A. FedericoLegab, L. and Sargiacomoa, M. (2015). Lean in healthcare: A  
51  
52 comprehensive review. *Health Policy*, 119, 1197-1209.

- 1  
2  
3 Esain, A. Kumar, M. and Williams, SJ. (2016), Reflections and a research agenda in Radnor, Z.,  
4  
5 Bateman, N. Esain, A. Kumar, M. Williams, S. and Upton, D (Eds), *Public Service Operations*  
6  
7 *Management: A research handbook*, Routledge, Abingdon, Oxon.  
8  
9  
10 Filipe, A. Renedo, A. Marston, C. (2017), “The co-production of what? Knowledge, values, and  
11  
12 social relations in health care.” *PLoS Biology*, Vol. 15, No. 5, pp. e2001403.  
13  
14 Froehle, C. and Magazine, M. (2012), “The state of healthcare in OR/OM”, *Manufacturing and*  
15  
16 *Service Operations Management*, Vol. 14, No. 4, pp.495 -499.  
17  
18  
19 Gastaldi, L. Mangiaracina, R. Miragliotta, G. Perego, A. and Tumino, A. (2015). “Measuring the  
20  
21 benefits of tracking medical treatment through RFID”, *International Journal of Productivity*  
22  
23 *and Performance Management*, Vol 64, No. 2, pp. 175-193.  
24  
25  
26 Golden, B. and Seidmann, A. (2012), “Introduction to the special issue on applications of  
27  
28 healthcare operations management”, *Manufacturing and Service Operations Management*, Vol.  
29  
30 14, No. 4, pp. 485-487.  
31  
32  
33 Gray, M. (2017), “Value based healthcare”, *The BMJ*, Vol. 356 2017;356:j437 doi:  
34  
35 10.1136/bmj.j437.  
36  
37  
38 Green, L.V. (2012), “The vital role of operations analysis in improving healthcare delivery”,  
39  
40 *Manufacturing and Service Operations Management*, Vol. 14, No. 4, pp. 488-494.  
41  
42  
43 Grindle, M. and Hildebrand, M. (1995), “Building sustainable capacity in the public sector: what  
44  
45 can be done?” *Public Administration and Development*, Vol. 15, pp. 441-463.  
46  
47  
48 Gronoos, C. (2007), “*Service Management and Marketing*”, John Wiley & Sons, Chichester.  
49  
50 Harvey, J. (2011), *Complex Service Delivery Processes: Strategy to Operations*, 2<sup>nd</sup> edition,  
51  
52 Quality Press, Milwaukee, WI.  
53  
54 Henrique, D. and Filho, M. (2020). “A systematic literature review of empirical research in Lean  
55  
56 and Six Sigma in healthcare”, *Total Quality Management & Business Excellence*, 31:3-4, 429-  
57  
58  
59  
60

1  
2  
3 449,  
4

5 Judd, R. (1964), "The case for redefining services", *Journal of Marketing*, Vol. 28, No. 1, pp. 58-  
6  
7 59.  
8

9  
10 Kaehne, A., Beacham, A., and Feather, J. (2018), "Co-production in integrated health and social  
11  
12 care programmes: A pragmatic model: Managing community care". *Journal of Integrated*  
13  
14 *Care*, Vol. 26, No. 1, pp. 87-96.  
15

16  
17 Karwan, K. and Markland, R. (2006), "Integrating service design principles and information  
18  
19 technology to improve delivery and productivity in public sector operations: The case of South  
20  
21 Carolina DMV." *Journal of Operations Management*, Vol. 24, pp. 347-362.  
22

23  
24 King, N. (1998), Template Analysis in G. Symon, & C. Cassell, (Eds.) "*Qualitative Methods and*  
25  
26 *Analysis in Organisational Research*", Sage publications, London.  
27

28  
29 King, N. (2004) Using templates in the thematic analysis of text, in Cassell, C. & Symon, G.  
30  
31 (Eds), "*Essential Guide to Qualitative Methods in Organisational Research*", Sage, London.  
32

33  
34 Kleindorfer, P., Singhal, K. and van Wassenhove, L. (2005), "Sustainable operations  
35  
36 management", *Production and Operations Management*, Vol. 14, No. (4), pp. 482-492.  
37

38  
39 Krings, D. Levine, D. and Wall, T. (2006), "The Use of "Lean" in Local Government." *Public*  
40  
41 *Management*, Vol. 88, No. 8, pp. 12-17.  
42

43  
44 Long, J. Cunningham, F. and Braithwaite, J. (2013), "Bridges, brokers and boundary spanners in  
45  
46 collaborative networks: a systematic review. *BMC Health Services Research*, Vol. 13, No.  
47  
48 158: Available at [https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-13-](https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-13-158#ref-CR17)  
49  
50 158#ref-CR17.  
51

52  
53 Lusch and Vargo McCannon J, and Berwick D.M.. (2011), "A new frontier in patient safety",  
54  
55 *The Journal of the American Medical Association*, Vol. 305, pp. 2221-2.  
56

57  
58 Martin, S. (2010), Regulation, In Ashworth, R., Boyne, G. and Entwistle, T. (Eds), *Public Service*  
59  
60

1  
2  
3 *Improvement: Theories and Evidence*, pp.36-59. Oxford University Press, Oxford.

4  
5 McGuire, L. (2012), “Slippery concepts in context. Relationship marketing and public services”,  
6  
7 *Public Management Review*, Vol. 14, pp. 541-555.

8  
9  
10 McLaughlin, K. Osborne, S. and Ferlie, E. (2002), “*New Public Management: Current Trends*  
11  
12 *and Future Prospects*”, Routledge, London.

13  
14  
15 McLaughlin, K., Osborne, S. and Chew, C. (2009), “Developing the marketing function in U.K.  
16  
17 public service organizations: the contribution of theory and practice”, *Public Money and*  
18  
19 *Management*, Vol. 29, pp. 35–42.

20  
21 McNulty, T. and Ferlie, E. (2002) *Reengineering Health Care: The Complexities of*  
22  
23 *Organizational Transformation*. Oxford University Press, Oxford.

24  
25  
26 Meredith, J. (1998), “Building operations management theory through case and field research”.  
27  
28 *Journal of Operations Management*, Vol. 16 No. 4, pp. 441-454.

29  
30  
31 Needham, C. and Carr, S. (2009), “*Co-production: an emerging evidence base for adult social*  
32  
33 *care Transformation*”, SCIE Research briefing 31, Social Care Institute, London.

34  
35  
36 Newbould, J. Abel, G. Ball, S. Corbett, J. Elliott, M, et al. (2017). “Evaluation of telephone first  
37  
38 approach to demand management in English general practice: observational study”. *The BMJ*,  
39  
40 Vol. 358:j4197 | doi: 10.1136/bmj.j4197.

41  
42  
43 NHS England (2013). *High quality care now and for future generations: Transforming urgent*  
44  
45 *and emergency care services in England*. Page 35-36. Available at:  
46  
47 <https://www.england.nhs.uk/wp-content/uploads/2013/06/urg-emerg-care-ev-bse.pdf>  
48  
49 [Accessed 21<sup>st</sup> April 2020].

50  
51 Okemiri, H. Alo Uzoma, R. Achi, I. Oketa, C. Nnamene, C. and Chima, C. (2020). “Patient Data  
52  
53 Integration: A panacea for effective healthcare”, *Journal of Computer Science*, Vol. 16, No. 2,  
54  
55 pp 235-248.

- 1  
2  
3 Osborne, S. and Brown, L. (2011), "Innovation, public policy and public services: the word that  
4 would be king?" *Public Administration*, Vol. 89, pp. 1335-1350.  
5  
6  
7 Osborne, S. and Strokosch, K. (2013), It takes two to tango? Understanding the co-production of  
8 public services by integrating the service management and public administration perspectives,  
9  
10 *British Journal of Management*, Vol. 24, pp. S31-S47.  
11  
12  
13 Osborne, S., Radnor, Z., Kinder, T. and Vidal, I. (2015), "The SERVICE framework: A public-  
14 service- dominant approach to sustainable public services", *British Journal of Management*,  
15  
16 Vol. 26, pp. 1-15.  
17  
18  
19 Osborne, S. Radnor, Z. and Nasi, G. (2013), "A new theory for public services management?  
20 Towards a (public) service-dominant approach", *American Review of Public Administration*,  
21  
22 Vol. 43, pp. 135-158.  
23  
24  
25 Osborne, P., Radnor, Z. and Strokosch. K. (2016), "Co-Production and the Co-Creation of Value  
26 in Public Services: A Suitable Case for Treatment?" *Public Management Review*, Vol. 18, No.  
27  
28 5, pp. 639–653.  
29  
30  
31 Palmer, V. Weavell, W. Callander, R. Piper, D. Richard, L. Maher, L. Boyd, H. Herrman, H.  
32  
33 Furler, J. Gunn, J. Iedema, R. and Robert, G. (2018). The Participatory Zeitgeist: An  
34  
35 explanatory theoretical model of change in an era of coproduction and codesign in healthcare  
36  
37 improvement. *Journal of Medical Humanities*, [http://dx.doi.org/10.1136/medhum-2017-](http://dx.doi.org/10.1136/medhum-2017-011398)  
38  
39 011398  
40  
41  
42  
43  
44  
45  
46 Papadopoulos, T., Radnor, Z. and Merali, Y. (2011), "The role of actor associations in  
47  
48 understanding the implementation of Lean thinking in healthcare", *International Journal of*  
49  
50 *Operations & Production Management*, Vol. 31, pp. 167–191.  
51  
52  
53 Parnaby, J. and Towill, D.R. (2008), "Seamless healthcare delivery systems", *International*  
54  
55 *Journal of Health Care Quality Assurance*, Vol. 21, No. 3, pp. 249-273.  
56  
57  
58  
59  
60

- 1  
2  
3 Piercy, N. and Brammer, S. (2012), “A complete definition of corporate social responsibility and  
4 sustainability”, *British Academy Report*, London  
5  
6  
7  
8 Piercy, N. and Rich, N. (2015), “The relationship between lean operations and sustainable  
9 operations”, *International Journal of Operations & Production Management*, Vol. 35, No. 2,  
10 pp. 282-315.  
11  
12  
13  
14 Pil, F. and Rothenberg, S. (2003), “Environmental performance as a driver of superior quality”,  
15 *Production and Operations Management*, Vol. 12, No. 3, pp. 404-415.  
16  
17  
18  
19 Pitchforth E, Nolte E, Corbett J, Miani C, Winpenny E, van Teijlingen E, et al. (2017)  
20  
21 “Community hospitals and their services in the NHS: identifying transferable learning from  
22 international developments – scoping review, systematic review, country reports and case  
23 studies”. *Health Services and Delivery Research*, No 5. 19. <https://doi.org/10.3310/hsdr05190>  
24  
25  
26  
27  
28 Poksinska, B. Fialkowska-Filipek, M. and Engstrom, J. (2016). “Does Lean healthcare improve  
29 patient satisfaction? A mixed-method investigation into primary care”, *BMJ Quality & Safety*,  
30 Vol. 26, No 2, dx.doi.org/10.1136/bmjqs-2015-004290.  
31  
32  
33  
34  
35 Presti, L. Testa, M. Marino, V. and Singer, P. (2019). “Engagement in healthcare systems:  
36 Adopting digital tools for a sustainable approach”, *Sustainability*, Vol. 11, No. 220  
37 doi.org/10.3390/su11010220.  
38  
39  
40  
41  
42 Proksch, D. Busch-Casler, J. Haberstroh, M. and Pinkwart, A. (2019), “National health  
43 innovation systems: Clustering the OECD countries by innovative output in healthcare using a  
44 multi indicator approach”. *Research Policy*, 48, pp. 169-179.  
45  
46  
47  
48  
49 Proudlove, N., Moxham, C. and Boaden, R. (2008), “Lessons for lean in healthcare from using  
50 Six Sigma in the NHS” *Public Money & Management*, Vol. 28, No. 1, pp. 27-34.  
51  
52  
53  
54 Qu, X., Simpson, L. and Stanfield, P. (2011), “A model for quantifying the value of RFID-  
55 enabled equipment tracking in hospitals”, *Advanced Engineering Informatics*, Vol. 25 No. 1,  
56  
57  
58  
59  
60

pp. 23-31.

Radnor, Z. (2010), *Review of Business Process Improvement Methodologies in Public Services*.  
Advanced Institute of Management, London.

Radnor, Z. and Bateman, N. (2016), The Role and Substance of Public Service Operations  
Management in Radnor, Z., Bateman, N. Esain, A. Kumar, M. Williams, S. and Upton, D  
(Eds), *Public Service Operations Management: A research handbook*, Routledge, Abingdon,  
Oxon.

Radnor, Z. and Osborne, S. (2015), Operationalising lean in service, in Radnor, Z., Bateman, N.  
Esain, A. Kumar, M. Williams, S. and Upton, D (Eds), *Public Service Operations  
Management: A research handbook*, Routledge, Abingdon, Oxon.

Radnor, Z. and Osborne, S. (2013), "Lean: a failed theory for public services?" *Public  
Management Review*, Vol. 15, pp. 265–287.

Radnor, Z., Osborne, S., Kinder, T. and Mutton, J. (2014), "Operationalising co-production in  
public services delivery: the contribution of service blue-printing", *Public Management  
Review*, Vol. 16, pp.13-20.

Realpe, A. and Wallace, L. (2010), "*What is co-production?*" Health Foundation, London.

Rechel, B. (2020). *How to enhance the integration of primary care and public health?  
Approaches, facilitating factors and policy options*, European Observatory of Health Systems  
and Policies. Available at [https://apps.who.int/iris/bitstream/handle/10665/330491/19978073-  
eng.pdf](https://apps.who.int/iris/bitstream/handle/10665/330491/19978073-eng.pdf) (Accessed 28th April 2020).

Richard, G. (2008), *Performance is the Best Politics: How to Create High-Performance  
Government Using Lean Six Sigma*. HPG Press, Fort Wayne.

Seddon, J. and Brand, C. (2008), "Debate: Systems Thinking and Public Sector Performance."  
*Public Money and Management*, Vol. 28, No. 1, pp. 7-10.

- 1  
2  
3 Skalen, P., J. Gummerus, C. von Koskull and Magnusson, P. (2014), “Exploring value  
4 propositions and service innovation: a service-dominant logic study”, *Journal of the Academy*  
5  
6 *of Marketing Science*, Vol. 43, pp. 137–158.  
7  
8  
9  
10 Sloan, T., Fitzgerald, A. Hayes, K. Radnor, Z. Robinson, S. and Sohal, A. (2014), "Lean in  
11 healthcare – history and recent developments", *Journal of Health Organization and*  
12  
13 *Management*, Vol. 28, No. 2, doi.org/10.1108/JHOM-04-2014-0064.  
14  
15  
16  
17 Sun, P.R., Wang, B.H. and Wu, F. (2008), “A new method to guard inpatient medication safety  
18 by the implementation of RFID”, *Journal of Medical Systems*, Vol. 32 No. 4, pp. 327-332.  
19  
20  
21 Swedberg, C. (2010), “Apollo Hospital Chennai uses RFID to speed up check-ups”, *RFID*  
22  
23 *Journal*, June, pp. 1-3, available at: [www.rfidjournal.com/articles/view?7659](http://www.rfidjournal.com/articles/view?7659)  
24  
25  
26 Taylor, A. and Taylor, M. (2009), "Operations management research: contemporary themes,  
27 trends and potential future directions." *International Journal of Operations & Production*  
28  
29 *Management*, Vol. 29, No. 1, pp.1316-1340.  
30  
31  
32  
33 The King’s Fund, (2015), *Health and social care: three priorities for the new government*.  
34 Available at: <http://www.kingsfund.org.uk/projects/new-gov/three-priorities-new-government>  
35  
36 [Accessed 9th July 2020].  
37  
38  
39  
40 Thune, T. and Mina, A. (2016). “Hospitals as innovators in the health-care system: a literature  
41 review and research agenda”. *Research Policy*, Vol. 45, No. 8, pp. 1545-1557.  
42  
43  
44  
45 Vanden Bulte, C., & Wuyts, S. (2007). *Social networks and marketing*. Cambridge, MA:  
46 Marketing Science Institute.  
47  
48  
49 Verma, R. and Jayashima, K.(2014), “Service delivery innovation architecture: an empirical  
50 study of the antecedents and outcomes”, *IIMB Management Review*, Vol. 26, pp.105–121.  
51  
52  
53  
54 Virtanen , P. and Stenvall, J. (2014), "The evolution of public services from co-production to co-  
55 creation and beyond: New Public Management's unfinished trajectory?", *International Journal*  
56  
57  
58  
59  
60

1  
2  
3 *of Leadership in Public Services*, Vol. 10, No. 2, pp. 91 – 107.

4  
5 Wackerbarth, S. Bishop, S. and Aroh, A. (2020). Lean in Healthcare: Time for evolution or  
6  
7 revolution? *Journal of Healthcare Quality*, doi: 10.1097/JHQ.0000000000000253.

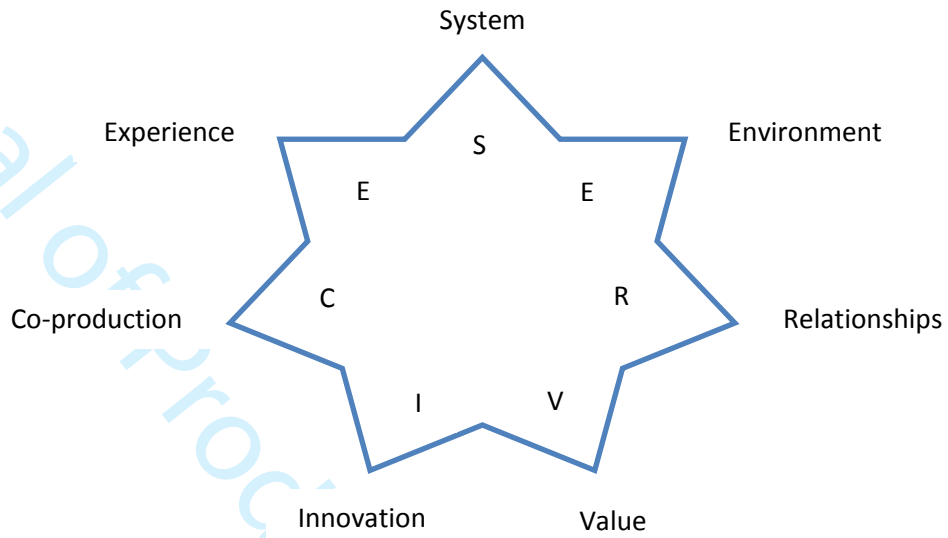
8  
9  
10 Williams, SJ. (2017), *Improving Healthcare Operations: The application of Lean, Agile and*  
11  
12 *Leagility in the design of care pathways*, Palgrave MacMillan: London.

13  
14 Williams, SJ and Radnor, Z. (2017), Using Bandwidths to Visualise and Improve Patient  
15  
16 Pathways, *Public Money & Management*, Vol. 37, No. 7, pp. 21-28.

17  
18  
19 Williams, SJ and Caley, L. (2020), *Improving Healthcare Services: Co-design, Co-production*  
20  
21 *and Operations*, Palgrave MacMillan: London.

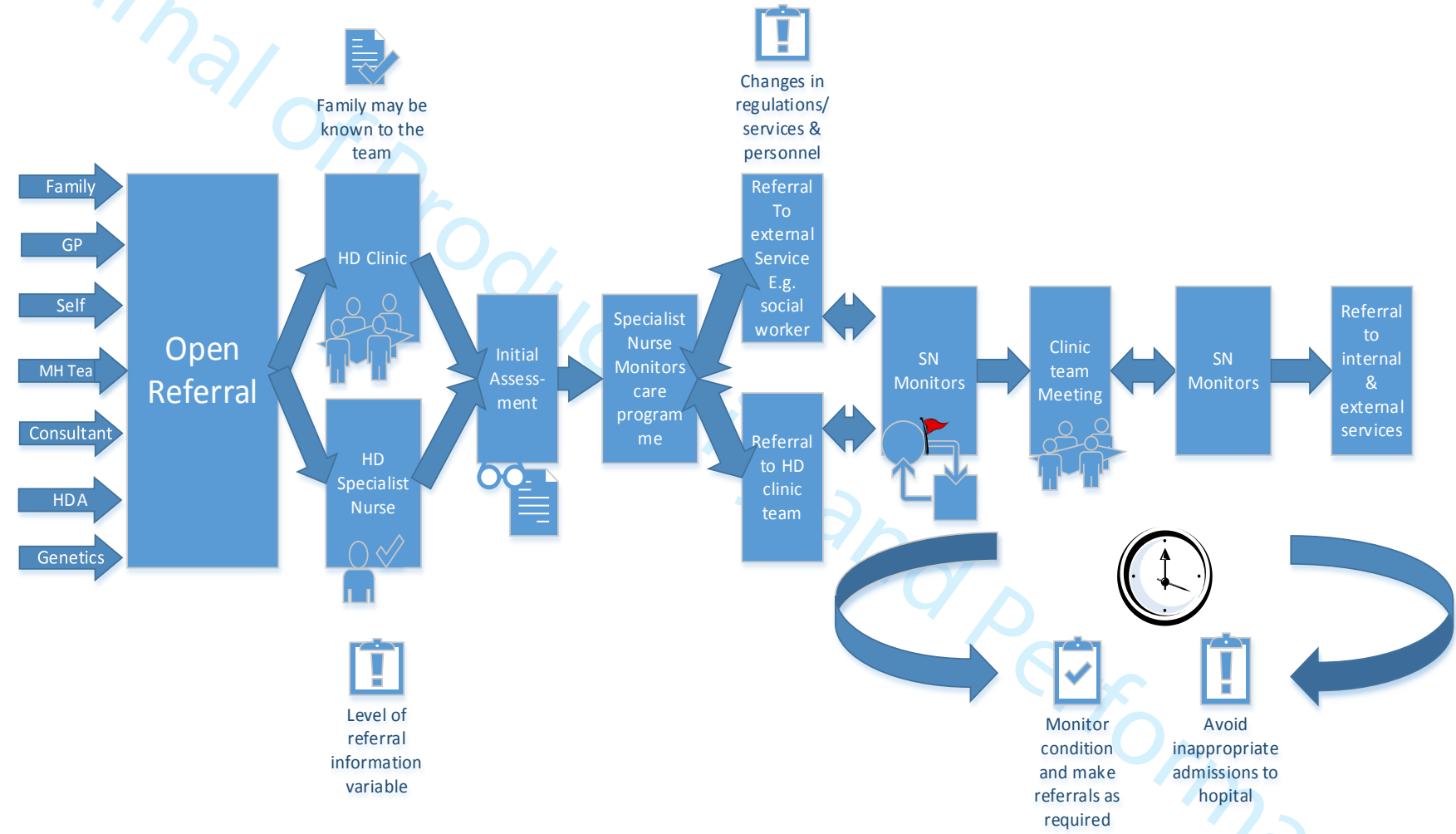
22  
23  
24 Yin, R. K., (2014). *Case Study Research: Design and Methods*. 5<sup>th</sup> edition, Sage Publications,  
25  
26 London.

Figure 1 - Seven-point SERVICE star of sustainable business model for public service organizations



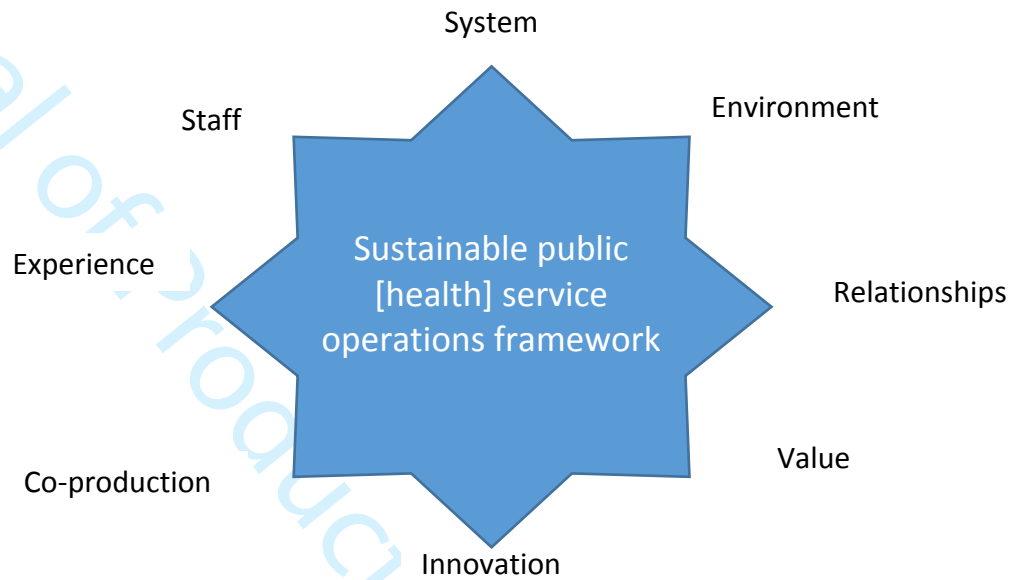
Source: Osborne et al., 2015, p 11

Figure 2. High-level process map of HD patient care pathway



Source: Authors

Figure 3. A eight point SERVICES framework for a sustainable public (health) service operations



Adapted from Osborne et al (2015)

Table 1 SERVICE framework theoretical propositions.

<i>Proposition 1</i>	Public services are <i>systems</i> (not individual organizations) and need to be governed accordingly (Radnor et al., 2014)
<i>Proposition 2</i>	Public service organizations need to embrace and <i>embed</i> organizational sustainability in the short term but also realizing this is not sufficient for long-term sustainability (Boozeman, 2002; Grindle and Hilderbrand, 1995)
<i>Proposition 3</i>	Long-term <i>relationships</i> are needed to support sustainable public services, rather than discrete short-term transactions (McGuire, 2012; McLaughlin et al., 2009)
<i>Proposition 4</i>	Creating sustainable public <i>value</i> for local communities is dependent on internal efficiencies and external effectiveness (Radnor and Osborne, 2014; Vidal, 2013).
<i>Proposition 5</i>	Public service organizations need to <i>innovate</i> and disseminate this across the service system to achieve service effectiveness (Osborne and Brown, 2011).
<i>Proposition 6</i>	<i>Co-production</i> is at the centre of public service delivery (Osborne and Strokosch, 2013).
<i>Proposition 7</i>	Public service systems need to generate and capture knowledge to help deliver and sustain effective service <i>experience</i> (Lusch and Vargo, 2006; 2014)

Source: Adapted from Osborne et al., (2015, p. 5)

Table 2 – Six dimensions of sustainable improvement

1. <i>Environment</i>	The impact on the natural environment of business operations, the use, reuse and recycling of materials (resources) for consumption and post consumption. Piercy and Rich (2014) note the environmental benefits that lean production can bring in relation to improved quality and less defects and rework.
2. <i>Workforce</i>	Four sub-dimensions are identified for this dimension:  workplace operational issues (providing a safe working environment with good working conditions), compensation (fair wages and payment), diversity issues (Non-discrimination in hiring) and union relations (recognition).  Having an engaged, empowered and well-trained workforce is a key part of organisational change and lean improvement (Storey, 1994).
3. <i>Supply chain</i>	How organisations work with the members of their supply chain is of importance particularly in relation to labour practices and how they treat suppliers. Building close, long-term relationships and transparent levels of communication and information exchange are some of the factors well established in the Lean and green supply chain literature (e.g. Simpson and Power, 2005).
4. <i>Community contributions</i>	This focuses on how organisations make a positive contribution to the local community, for example making charitable donations or positively supporting the community (e.g. Lee and Shin, 2010)
5. <i>Governance &amp; ethics</i>	This relates to the management of activities such as socially responsible investment, having a clear and written ethics policy, and ensuring legal compliance.  As noted above, transparency of information within the organisation and across organisational boundaries underpins improvement and sustainability activity.
6. <i>Product &amp; service quality</i>	Ensuring products and services are safe and fit for purpose, of good quality and marketing activities are accurate are examples of this dimension. Improving operations and product and service quality are central to lean operations (Womack and Jones, 1996).

Compiled from Piercy and Brammer (2012) and Piercy and Rich (2015)

Table 3 Comparison of the SERVICE propositions and dimensions of improvement and sustainability

<i>SERVICE framework</i>	<i>Sustainable improvement</i>
Whole <i>systems</i> approach	This should span the entire <i>supply chain</i>
Embed <i>organizational sustainability</i> in the short and long-term.	<i>Environmental</i> sustainability should be part of this along with <i>governance</i> arrangements and <i>quality</i> improvement.
Long term <i>relationships</i> are encouraged	This can include <i>workforce</i> , <i>supply chain</i> and the wider <i>community</i>
Establishing sustainable public <i>value</i>	This requires collaborative relationships with the <i>supply chain</i> and <i>community</i> members
<i>Innovate</i> to achieve service effectiveness	Innovation can occur in many ways include <i>environment</i> , <i>supply chain</i> , <i>quality</i> improvement and investment in the <i>workforce</i>
<i>Co-production</i> of service	This requires the service-user and possibly the <i>community</i> to be at the centre of service provision
Knowledge creation and mobilization to enhance the service <i>experience</i>	The generation of knowledge can be linked internally to the <i>workforce</i> and externally to <i>supply chain</i> and <i>community</i> members. Structures and <i>governance</i> need to be in place to encourage creation and dissemination of knowledge for improvement and sustainability of services

Source: Compiled by the authors

Table 4. Selection criteria for HD case study and participants

<ul style="list-style-type: none"><li>• Based in the community – majority of health improvement research focuses on acute care (hospital)</li></ul>
<ul style="list-style-type: none"><li>• Multi-disciplinary nature of the team – provide different perspectives of the care pathway</li></ul>
<ul style="list-style-type: none"><li>• Interaction of team with other health and public services – innovative spirit of team</li></ul>
<ul style="list-style-type: none"><li>• Complexity of the care pathway as no clear trajectory of care</li></ul>
<ul style="list-style-type: none"><li>• Maturity of team and delivery of family-centred care</li></ul>
<ul style="list-style-type: none"><li>• Service users had to have been accessing services for at least 6 months.</li></ul>
<ul style="list-style-type: none"><li>• All participants needed to be able to provide consent to participate in the study</li></ul>

Source: Authors

Table 5 Coding and data examples

Proposition	Code	Example of data
1. Whole systems approach	Signposting	We are frequently looking to signpost or accompany patients when need to access other services (healthcare professional)
	Accessing services	The HD MDT are the first port of call if we need to access other services. The team would know or would find out for us who we need to contact (relative)

Source: Authors

Table 6. Examples of the SERVICE propositions and dimensions of sustainable improvement for the Huntington's disease service

Proposition	HD Examples
1. System	Connecting across the service provision (and care supply chain) to help deliver an integrated service. Examples of working across health and social care.
2. Embed	One element of embedded organizational sustainability is the continuity of the team members and ensuring any new members are properly inducted and well versed in the systems supporting the HD service.
3. Relationships	Maintaining good relationships with patients is important for the team. Similarly patients valued the accessibility of the team and the continuity of the team. Given the nature of the disease the team works closely with the family as well as the patient.
4. Value	Constantly reviewing the needs of the patients/relatives to help understand their requirements to maintain function and independence. With such a complex condition this often requires multi-agency working which the team may coordinate.
5. Innovation	Innovations are introduced by the team in response to the needs of patients and relatives for example the monthly group meetings. Technological solutions tend to be driven by patients and relatives e.g. use of WhatsApp and Facebook
6. Co-production	Interestingly when the team members were interviewed not all of them described their service to be co-produced. Yet the above recent example indicates that the team are moving towards the coproducing their service.
7. Experience	All team members made reference to trying to improve the patient experience. Ensuring interventions were available at the appropriate stage within the patient's health trajectory. In addition, being clear when assistance was available and when it was limited.
<b>Additional factors</b>	
8. Workforce	Each team member is assigned a professional mentor. Weekly meetings are held to discuss new and existing cases. Capacity is pooled to maintain a responsive service for existing and new patients and to manage workloads.
9. Environmental	These dimensions were not mentioned directly but the team is governed by their organisational policies and procedures which include environment, technology and health & safety etc.

Source: Compiled by authors