Innovation in the Public Sector

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Innovation in the health sector – case study analysis

By Paul Cunningham

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Innovation in the Public Health sector: A case study analysis

PUBLIN Work Package 4: Synthesis Report

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Introduction

Background

This report arises from an international study, PUBLIN[1], funded by the European Commission, DG Research. PUBLIN is part of the programme for research, technological development and demonstration on 'Improving the human research potential and the socio-economic knowledge base, 1998-2002' under the EU 5th Framework Programme.

This study sets out to test a series of "statements" concerning the process of innovation as it occurs in the public sector. The study was prompted by the general observation that innovation is not perceived to occur to the same extent within the public sector context as it does in the private sector. The research methodology selected to test these statements was to map the development of an innovation within the context of the public health sector and to examine the factors that stimulate, drive, facilitate, resist and disseminate innovation through a series of case studies conducted in six European countries (Ireland, The Netherlands, Spain, Sweden and the United Kingdom – the latter with two case studies by separate teams). Each case study focused on a single innovation, although it quickly became evident that the innovations studied were both dependent upon and led to sets of parallel and complementary innovations.

Overall, the format of presentation and key focal questions varied between the case studies, largely as a consequence both of the differing analytical perspectives of the teams and the divergent contextual locations and contexts of the innovations studied. However, each case study tracks the origins of the innovation in question and examines the 'critical events' in their development. Similarly, issues such as the pressures, drivers and rationale for the introduction of the innovation, barriers to its diffusion and uptake and facilitating factors may also be derived from each case study and this framework is used as the basis for the synthesis and analysis. These case studies are not intended to be evaluative or judgemental but may draw on evaluations, reviews and associated documents, together with interviews of the major proponents and actors. This synthesis does not set out the specific methodologies for each case study; readers seeking to such information are referred to the individual case study reports. However, the broad methodological concepts and definitions employed are set out below.

More specifically, the objectives of this PUBLIN Work Package were:

1. To understand the innovation processes present within national public health systems.
2. To understand the learning processes underlying policy development in publicly regulated health sectors.

[1] http://www.step.no/publin/

Key terms and concepts

Innovation

Green, Howells and Miles (2001), in their investigation of service innovation in the European Union, provide a suitable definition of the term innovation which denotes a process where organisations are

> "doing something new i.e. introducing a new practice or process, creating a new product (good or service), or adopting a new pattern of intra- or inter-organisational relationships (including the delivery of goods and services)".

What is clear from Green, Howells and Miles' definition of innovation is that the emphasis is on novelty. As they go on to say,

> "innovation is not merely synonymous with change. Ongoing change is a feature of most… organisations. For example the recruitment of new workers constitutes change but is an innovative step only where such workers are introduced in order to import new knowledge or carry out novel tasks".

Change then, is endemic; organisations grow or decline in size, the communities served, the incumbents of specific positions, and so on. Innovation is also a common phenomenon, and is even more prominent as we enter the "knowledge-based economy".

An innovation can contain a combination of some or all of the following elements:

- New characteristics or design of service products and production processes *(Technological element)*
- New or altered ways of delivering services or interacting with clients or solving tasks *(Delivery element)*
- New or altered ways in organising or administrating activities within supplier organisations *(Organisational element)*
- New or improved ways of interacting with other organisations and knowledge bases *(System interaction element)*
- New world views, rationalities and missions and strategies. (*Conceptual element*)

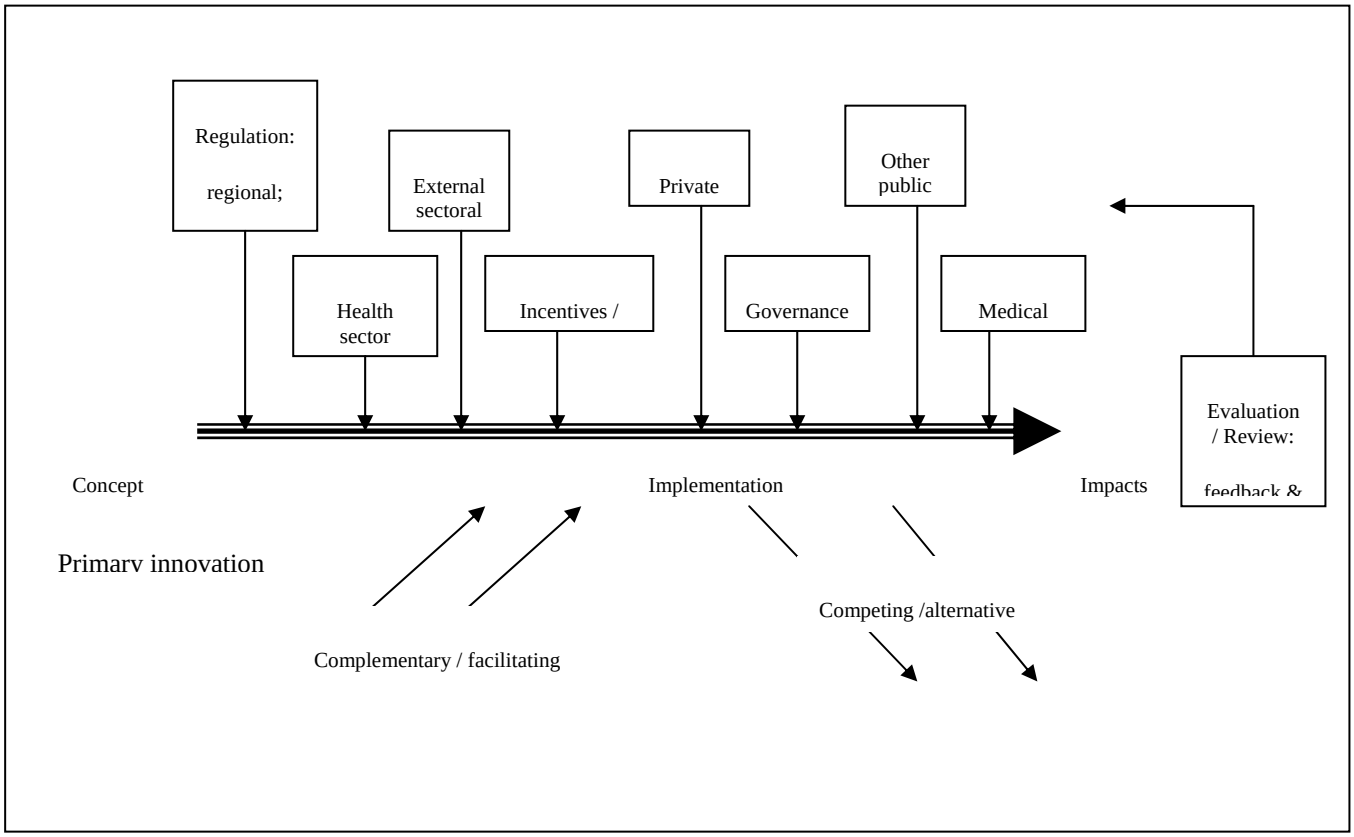
These are broad headings and several subcategories exist within each. What is noteworthy is that the bulk of empirical innovation studies to date focus just on the first category. Often the topic of "organisational innovation" is introduced only to deal with "innovating organisations", i.e. what sorts of organisational structure are required to engender or respond to technological innovations. However, there are also innovations in terms of organisational techniques (e.g. just-in-time and quality control systems) that can be studied in much the same way as more technological innovations; and there are similarly innovations in terms of organisational roles and functions (such as ombudsman and complaints systems) that can be studied in terms of the diffusion of organisational structures.

The Innovation environment

The case study approach depends on the assumption that every innovation whether at an operational level or a policy level can be placed within an innovation environment or domain. Within this environment at policy level there are other competing or alternative policies and complementary or facilitative policies for a specific area of public sector activity. For example, these policies may relate to those concerning regulation, the private or not-for-profit sector or professional practice. Also within this environment are service or operational innovations that arise within that area of public sector activity. Some of these innovations may have been instigated by a particular new government policy, others by service, operational or other factors. Either way the environment in which a primary innovation can occur finds itself being facilitated or competing with other innovations for its development and diffusion. Organisational capabilities and human networks are amongst other inter-related factors that are found within this complex environment. Molina (1990) saw this innovation environment as containing socio-technical constituencies, in which stakeholders worked to develop specific innovations and where factors such as policy regulation, trends, history, organisational capabilities and other contextual pressures shaped the development of an innovation**.**

This concept is illustrated in the following, admittedly rather simplistic, diagram.

Figure 1: The Innovation "environment"



The PUBLIN Research "statements"

In an effort to define a common methodological framework within which to study innovation in the public sector, several statements were put forward and related policy questions suggested. These give a '*problem driven view*' of the issue under study (den Hertog 2003)

(see Tables 1 and 2 below). It should be strongly emphasised that this list was only intended to be indicative of what propositions might be tested and it was expected that it would be subject to reformulation and improvement during the course of the PUBLIN study. While acknowledging that the innovation process is an iterative and complex process, the statements and related questions can be situated within a linear model ("life story") of the innovation process and associated policy learning, as a way of unpacking the different issues of interest to study.

Table 1. Statements for Service Innovation

	Hypothesis	Policy Questions
Initiation		
	Public sector innovation is born out of the need to solve specific service related problems or concerns.	What was the primary rationale for the innovation under study? Were there supporting rationales? Was the innovation developed proactively or reactively? Where did (recognition of) the need for the innovation originate?
	Performance targets are a driver for and facilitator of public sector innovation.	What are the most appropriate incentives and drivers for innovation in the public sector system under study?
	There are significant differences between "top-down" (i.e. policy-led) innovations and "bottom-up" (i.e. demand/practice-led) innovations.	Does the location of the pressure for the introduction of an innovation impact its diffusion and development?
Design and Development		
	Service innovation solutions are mainly developed outside the public sector and then transferred into the public sector through imitation	How best to harness and support public sector innovation? Where did the innovation arise? Does it have models outside or inside the public sector? Is there evidence of policy learning and any associated structures?
	The choices and features of service level innovations in the public sector are politically influenced by underlying organisational politics, dominant values and belief systems	How can the introduction of innovations overcome the resistance to change at service level?
	Most functional innovations are an outcome of service or operational level initiated processes	What could be done to improve the 'innovativeness' or innovative capacity of the public service system under study?
	The involvement of the end user in service level innovation process within the public sector is usually for pragmatic reasons to improve the design features and increase acceptance of the innovation	How best to manage the governance of innovation at service level?
Selection, Diffusion and Utilisation		
	The selection and diffusion of major service level innovations that can potentially have a radical effect on the public sector require effective networking, competence building and alternative thinking	How to create an open communication platform connecting various actors at operational level?

	Innovations at service level in the public sector that depend on intergovernmental co-ordination for diffusion require direct political intervention, or stimulus by a crisis situation	How can intra-governmental roadblocks be by-passed?
Evaluation and Learning		
	Innovation in the public sector is not the result of a passive process adaptation of R&D based findings at service level, but the product of complex processes and interactions between policy makers and related agencies and organisational constituents at service level.	How can complex innovation processes within the public sector be made more manageable?

Table 2 Statements for Policy Learning

	Hypothesis	**Policy Questions**
Initiation		
	Public policy innovation is born out of the need to solve specific policy related problems or concerns.	How can specific problem-orientated policy innovations be transformed into more general forms of policy learning? Is policy learning largely a reactive or proactive process?
	Policies directed at performance measurement are a driver for and facilitator of policy innovation	What are the most appropriate incentives and drivers for innovation in the public sector system under study?
Design and Development		
	Policy innovation solutions are mainly developed outside the public sector and then transferred into the public sector through imitation	How best to harness and support public sector innovation?
	The choices and features of policy level innovations in the public sector are politically influenced by underlying politics, dominant values and belief systems	How can the introduction of innovations overcome the resistance to change at service level?
	Policy innovations tend to focus on improving efficiency in the public sector	What could be done to improve the 'innovativeness' or innovative capacity of the public service system under study?
Selection and Deployment		
	The selection and deployment of major policy level innovations that can potentially have a radical effect on the public sector require an environment that encourages effective networking, competence building and alternative thinking	How to create an open communication platform connecting policy-makers and other stake holders at policy level with professionals and other actors at the operational level?
	The most challenging public policy innovations take place at the intra- governmental (inter-functional) level. Interventions that depend on intra-governmental co-ordination for deployment require direct political interaction, or stimulus from a crisis situation.	How can intra-governmental roadblocks be by passed?
Evaluation and Learning		
	The role of the end user in public sector policy making is to broaden the criteria by which policy learning occurs	How best to manage the governance of policy innovation in the public sector?

	Policy learning in the public sector is not the result of a passive process adaptation of R&D based findings, but the product of complex processes and interactions between policy makers and related agencies and organisational constituents at service level.	How can complex policy innovation processes within the public sector be made more manageable?

(Adapted from Friso den Hertog's paper *Doing Case Studies in PUBLIN*)

It is important to note that the above research questions were somewhat generic in nature and required some adaptation before it was possible to use them in the case study process. Moreover, each research question could form the basis of a number of sub-issues or questions, the precise nature of which could depend upon the source of information (i.e. position of interviewee, nature of the innovation, area of public sector, etc.). It was also clear that there was a substantial degree of overlap between the issues addressed in these two sets of questions, underlining a concern that the separation of case studies into sets of innovation (or service delivery)-focused and policy-focused issues may be artificial and problematic (i.e. the process of policy learning and the nature of the innovation are not independent).

In the event, the above concerns over the, rather prescriptive, sets of research statements and over the "artificial" separation of the service and policy levels and the nature of policy learning linking the two were realised during the course of the case studies. Although it was possible to draw some broad answers and lessons relating to the research statements, it was felt that another approach should be applied when synthesising the case studies.

Therefore, an alternative analytical framework was adopted which related more closely to the concept of the "innovation" environment. This was based on the idea that the innovation which formed the focus of the case study would be subject to a number of factors that influenced its development through time. These comprised:

- drivers or pressures which led to the creation or initiation of the innovation or which underpinned its rationale
- facilitating factors which enhanced the development, diffusion or acceptance of the innovation
- barriers which militated against the two sets of factors above and which needed to be overcome for the successful implementation of the innovation.

It was also found, in the course of the case studies, that the overall context within which the innovations took place, either in the immediate institutional or service setting or more broadly within the national public health sector, for example, could also be analysed in terms of such a framework. Thus, the characteristics of the individual innovations could be examined within their wider service and policy reference frames and specific policy lessons identified.

These barriers, drivers and facilitating factors are described in detail in Section 2.

Methodology

Service and policy innovation

At the initial planning stage, to encourage a common approach to selecting case studies each partner was encouraged to identify ***one*** *innovation environment*, and conduct two case studies within that. One case study was expected to encompass a primary health service innovation

(i.e. at service/delivery level), whilst the other would encompass a policy innovation (i.e. at government policy level). At this early stage, two potential issues were identified. First, that there may be elements of the other class of innovation in each of these (see the discussion on separation of the service and policy level in the previous Section). Second, that there may be somewhat different environments involved for each class of innovation, especially as one moves out to organisations/actors other than the primary starting-point of the analysis.

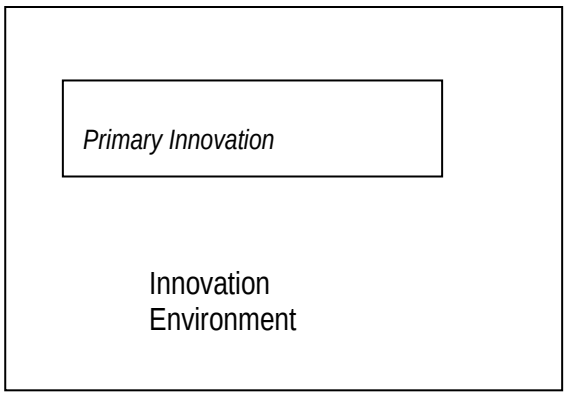
These issues were indeed found to be significant in a number of the case studies and as a consequence the treatment of the service and policy elements were combined into a single case study write-up although the analysis *policy learning* was given due attention.

Placing the innovation in context

Using the idea of the innovation as a linear process or "lifeline" as outlined in Section 1.2.2, the case study approach was designed to place the studied innovation in a series of nested contexts each of which might be expected to affect its development. This context was to be elucidated in three levels of phases:

- Phase 1 - Mapping of the National Health System: In order to view the wider context of an innovation, a brief overview of the structure of the national health service is needed. This overview should identify the key structures and actors supporting the various innovation systems that are operating within the national health system, with specific interest given to the public system.
- Phase 2 - Innovation Environment: This entails a study of the immediate innovation environment (see Figure 1), including the major factors impinging on the innovation itself.
- Phase 3 - Innovation events: The study of a single innovation, identifying key actors, structures, issues, processes and critical events involved (see Figure 2).

Figure 2. Simplified diagram of approach to data collection



National Health and Innovation Systems

Variables of interest

This PUBLIN study required acceptance of the idea that in doing exploratory case studies it is difficult to provide an exact plan of what is expected when some of the variables to be studied are unknown at the outset. Also there is a balance between freedom of interpretations of a phenomena and the provision of a specific protocol for this purpose to compare outcomes (Den Hertog 2003). However, to ensure some comparability of data collected for the case studies identified within each package, using Yin's (1989) embedded case study approach it was suggested that data collection should be carried out on two levels; the first level focusing on the chain of events in the innovation process, making up the first unit of analysis and the second, focusing on critical incidents or learning events that played a crucial role in the process as a whole. As noted above, the selected approach was to embed the case study to collect data concerning both the context of the innovation, the innovation environment and the process of behaviour change or transformation.

A number of potential innovation issues, from both the operational/service level and policy level perspectives were identified:

Contextual factors:

- The type or aspect of the health service which forms the focus of the innovation
- Regulatory and governance processes, organisational structures, professional spheres of practice related to the innovation(s) and innovation processes within the public service system under study
- Location or site of deployment of the innovation
- Characteristics of innovation processes and the dynamics the public service sector under study
- The competing and alternative innovations present
- Complementary innovations, the introduction of which facilitated or were essential for the progress of the primary innovation under study
- Factors driving or facilitating the innovation- policy, organisational, technological and or social

- Organisational structures, rules and collaborations supporting the success or failure of the innovation
- The 'innovativeness' or innovative capacity of the public service system under study. Assessment of this.

Process factors:

- Rationale for the process of innovation
- How far different actor(s) are involved in the process of innovation
- Experimentation and learning management practices in place
- Approach to diffusion of the innovation
- Types of knowledge supporting the innovation
- The effects of the innovation at service level
- How the success, utility and values of the innovation under study were judged (if at all). Actors involved in this process.
- Where knowledge comes from, e.g. training, conferences workshops, word of mouth, etc., to inform diffusion of innovation
- The effects on service delivery 'front of house' and 'behind the scenes'
- Previous evaluations of the innovation or innovation process

Policy context factors:

- The relationship between the public and private sector.
- The 'innovativeness' or innovative capacity of the policy system under study

Policy process factors:

- The primary rationale for the policy innovation under study. Supporting and competing rationales
- The flows of competencies and knowledge contributing to policy innovation
- The development of new policy instruments;
- Barriers and facilitative measures supporting policy deployment and implementation
- The reorganisation of publicly funded health organisations as a result of such innovation policies; and also
- The effects on the policy making process within government
- The effects on service delivery
- The feedback mechanisms related to policy learning;
- How was the success, utility and values of the policy innovation under study judged

In addition, it was suggested that each case study should identify '*critical incidents'*, events which have played a crucial role in the innovation process [as a whole] and which could be useful to identify basic learning in the process (Den Hertog 2003). It was anticipated that four to six such incidents should be studied per case.

The case studies

As noted above, six case studies were selected in the following countries: Ireland, The Netherlands, Spain, Sweden and the United Kingdom. In the latter country, two case studies were undertaken by separate research teams. The examples selected were:

1. Development of a patient-focused home-help service (Ireland)

2. Development and implementation of clinical pathways in the psychiatric hospital Vijverdal (The Netherlands)
3. The adoption of Digital Radiology technology and Main Ambulatory Surgery processes (Spain)
4. Hospital-Managed Advanced Care of Children in their Homes (Sweden)
5. Patient-Oriented Education Systems for Diabetes (UK)
6. NHS Direct – a nurse-operated medical telephone helpline service (UK)

Summaries of each case study are presented in the following sections.

Ireland: (University College Cork) "Innovation in the provision of home help services in the Southern Health Board area."

The case study focuses on the introduction of an innovative system of communication and team working in relation to home help services for the elderly and the chronically ill. The aim of the Southern Health Board (SHB) in this innovation was to introduce an "improved structure of communications and participation for all stakeholders2 designed to improve patient benefits, staff relations and worker satisfaction". The innovation was intended as a pilot for the Irish Health Service at large and took place in the context of the introduction of a national partnership programme which underpinned wage agreements – Workplace Partnership. This is an approach to negotiating both substantive and relationship changes, based on the introduction of formal structures for joint participation of trade unions, managers and staff in decision-making. Its goal is to develop shared understanding and joint problem solving approaches in the workplace at an early stage in decision-making, leading to solutions that take account of the needs of all workplace stakeholders.

A key element of this innovation was a move to interdisciplinary assessment and case work – to allow for participation in need assessment and decision-making by the home help workers who had previously been excluded from these processes. This case study produces a microcosm of service innovation in the public health service because it encapsulates the innovation process from inception to retrospection. At its core, the innovation introduced a multi-disciplinary approach to service provision. This meant the involvement of the health professional (in this case the public health nurse), the service coordinator (home help organiser) and the actual service provider (the home help worker) in allocating actual service provision.

Following on the needs-assessment in the new system, all three parties would be involved in determining the appropriate nature and level of service to be provided to the client. This innovation meant moving from a strongly demarcated and often disconnected process to an inclusive process where all members of the team had a timely opportunity to comment on the perceived needs of the client and the appropriate responses. It was also hoped that this innovative process would further encourage a multidisciplinary approach in the wider care of elderly clients, allow for regular feedback, and facilitate case management.

At the time the innovation took place, the Irish public health service had been actively engaged in a major change process for a number of years. This change was driven partly by a number of critical reviews of Irish health care, which pointed to the absence of a single organisation responsible for managing the health service as a unified national system. The

[2] All the stakeholders were supply-side based – there was no consultation with service recipients.

reviews also commented on the disconnection between budget and practice and recommended strenuous reform. In addition, at the time of this case study, considerable budgetary pressure was put on health providers as significant savings were sought across the health service.

These changes paralleled the changing sectoral environment in which clinical best practice had been evolving for twenty years and with it an increasing acceptance of the benefits and, some would say necessity, of multi-disciplinary work. This was particularly the case in the long-term care of the elderly. Since June 2001, all those over 70 years old in Ireland have been entitled to free health care under the general medical scheme. This means that everyone in this age group is potentially eligible for home help support, since it is provided under the general medical scheme.

The partnership group sought to test innovations in service delivery to the elderly with a view to process improvement, effective deployment of resources, and ultimately an improved service for the client group. The stated objective was to examine "the provision of a more responsive service to elderly clients in their own homes, underpinned by the framework of Partnership within the health service".

This case was chosen because it offered opportunities to examine a service innovation from inception to evaluation, and because the outcomes of the innovation were expected to feed into national policy on the public sector provision of care to the elderly, through the Partnership system.

Following the final (largely positive) feedback on the pilot a report was made to the SHB partnership working group who in turn reported back to the Health Services National Partnership Forum. However, in the interim period a number of significant changes had taken place. Most notably a decision had been made to scrap the health board system and develop a new national health service management body – the Health Service Executive. Also budgetary pressures, which had been so exacting during the period of the pilot, seemed to have relented and there was less pressure for home help expenditure to be reduced. For these reasons, the new system was not introduced on a wider basis and the SHB home help system reverted to prior practices.

The Netherlands (University of Maastricht): "Development and implementation of clinical pathways in the psychiatric hospital Vijverdal."

This case study focuses on the implementation of process innovation within the context of mental health care. It describes an innovation in mental health care: the development and implementation of clinical pathways in the psychiatric hospital Vijverdal in Maastricht (The Netherlands). The study describes a five-year period (2000-2005). The innovation in the Vijverdal hospital goes far beyond the implementation of new guidelines for treatment and care. Vijverdal decided to translate the pathways into new organisational forms of care and to create an organisational context for the development and implementation of patient-centred care programs (or *clinical pathways*), both by integrating and connecting internal and external groups and institutions of care providers. The hospital has become "flow-oriented" and now consists of care units that are responsible for care programs for specific groups of patients.

This process innovation has been linked with a flow-oriented organisational redesign, which is strongly influenced by the concept of flow-oriented design as developed in the Dutch

socio-technical school. This approach implies the design of organisations and organisational units with "whole tasks". A systems model has been used to analyze the innovation process and tries to map the driving and blocking forces at different stages and levels of the health care system. This mapping process builds on the model of healthcare innovation developed in an earlier explorative study (Den Hertog, F. *et al*. 2005), which describes healthcare services as nested and interacting systems. Special attention has been paid to crucial interfaces within the local innovation system. These interfaces are allocated along two basic dimensions of the systems model: (1) interfaces between functions in the health care value chain, (2) and the interfaces between the different system levels. The study can be regarded as a blend of case study, survey, participant observation and action research.

The case study concentrates on two levels: that of the activities of professionals and care managers involved in changing the organizational context of their work, and on the continuous pressures from the outside world, regulators, (regional) policy-makers, and other health care services, to reduce costs and improve quality of care. The results of the study underline, that innovation in health care implies an intensive organization development effort. The proposed systems model appears to be an adequate toolkit for understanding the innovation process and the interactions and interdependencies in the innovation system.

Spain (University of Alcala): "The adoption of innovations (Digital Radiology technology and Main Ambulatory Surgery processes) in a public hospital in Spain."

This study analyses the process of adoption of two innovations within the public health system in Spain: Digital Radiology (DR) technology, a technologically intense innovation, and the Main Ambulatory Surgery (MAS) process, which is a more organisational and managerial oriented innovation. Both innovations take place at the service level, i.e. within the hospital environment although both also involve aspects of policy learning. The hospital in question is that of La Princesa, situated in an urban area of Madrid.

The adoption of the Digital Radiology technique (as a replacement for the Analogue technique) resulted in differences in behavioural attitudes due to the way in which the X-ray is developed (technological change), how it is transported to the physician, how it can be stored, and the way in which doctors analyse the resulting X-rays, in addition to other economic and health impacts. Its significance stems from the fact that radiology is one of the most active areas of the hospital, comprising over 20% of all the hospital's annual services. Although not one of the most expensive areas per unit of service, the management of the radiology service has an enormous effect on other services in the hospital as many of the other hospital services refer patients to it for diagnostic purposes. Although the implementation of Digital Radiology has no direct impact on the patient it reduces costs and the time needed to provide the service, together with other improvements in other aspects of the service. The study undertakes a cost-benefit analysis of the introduction of the new technology as well as examining effects on the quality of the service.

The Main Ambulatory Surgery (MAS) system replaces the traditional surgery (TS) system and removes the necessity of overnight stays for post-operative patients. MAS permits the patient to leave the hospital on the same day of the surgery and receive outpatient care at home. Consequences include a substantial economic saving due to the higher cost of inpatient care compared to outpatient care. The main impact of the innovation took place at the organisational level through the adoption of different procedures and ways of acting not only for doctors, nurses and other hospital staff, but also for patients. Other impacts include

improvement in the management and a lower resource demand, particularly on hospital beds and other physical space. The study also examines the benefits of the MAS system, on organisational changes and on the quality of the service perceived by the patient.

Both innovation processes, DR and MAS implied technological and managerial or organisational changes for the hospital and the case study analyses the difference between both innovation processes, and the consequences of their implementation on the provision of health services in the hospital.

Sweden (VINNOVA): "Hospital-Managed Advanced Care of Children in their Homes."

This case study examines the unit for "Hospital-Managed Advanced Care of Children in their Homes" (SABH). Today, SABH forms a section of Astrid Lindgren Children's Hospital (ALB) at the Karolinska University Hospital in Stockholm County. The choice of SABH was influenced by the fact that it was known to the study team as an organisational innovation that also included technological innovations. SABH was, apparently, an example of how technological innovations in ICT and telemedicine can induce organisational innovations (although this turned out to be a misapprehension). It was felt that the study of such an innovation could provide insights to the relation of public health care and private ICT enterprises in the context of innovation.

The primary rationale for the innovation was to improve the quality of care for seriously ill children as well as improving the wellbeing of the child's family. The concept of the innovation arose in a context that facilitated its generation and development. The prime instigator saw SABH as a logical next step in a process that had made hospital paediatric wards more "homelike". The "second" instigator saw the concept as a important part of a larger process of renewal of childcare within the Stockholm County Council that resulted in the creation of ALB. An important element in the vision of this process was to improve the quality of childcare by minimising their time spent in hospitals.

The SABH-innovation was an organisational innovation which could profit from technological innovations e.g. in telemedicine. "Secondary" technological innovations were searched for in the private sector but the required technology was not available in the market. Hence, the project group initiated a number of collaborative development projects with private companies. However the technology goals formulated by the project group in 1997 had not been achieved when SABH started its activities in November 1998. A key problem in developing the required technology was the fact that the hospital had not allocated financial resources in the budget for such work.

The organisation of public health care in Sweden also influenced the implementation of the SABH-concept. At the County Council level politicians and civil servants were important players in the implementation process while at the Hospital heads at varying management levels influenced both the design and the implementation processes. Some incidents were interpreted by the project group as an indication that certain levels of the hospital management and the County Council administration were against the SABH-concept and its implementation. On the other hand the County commissioner for health care in Stockholm County Council actively supported the implementation. The study indicates that the delayed implementation of SABH was due to the lack of financial resources for development work in the County Council and the Karolinska hospital combined with a period of cutbacks, which explain the resistance to implementation of the SABH-concept. The pressure of budget

cutbacks in health care in Stockholm throughout the 1990s was an important element in the innovation context, i.e. cutbacks delayed the implementation of SABH.

The study presents a complex process of interaction due to the many levels of decision-making in public health care. The SABH project group had to search and apply for financial resources for implementing the concept as well as for acquiring and developing the facilitating technologies. They had to embed the concept at different management levels in the hospital and at the County Council and convince the responsible politician for health care in the County Council to support them in the administration and among politicians. They also had to convince the head of ALB to act on their behalf towards hospital management. Thus, the innovation process described can partly be characterised as "innovation by fighting". The project group encountered resistance from management which they fought within the hospital with the help of the media and the County Commissioner (and the head of ALB whom they had thought to be resistant to the idea). The County Commissioner took up the fight with the County Council administration and politicians with the aid of the media. The head of ALB had to fight with the management of the hospital to push the implementation of SABH forward. Such fighting was necessary due to the economic regime of cutbacks which put heavy restrictions on the County Council administration and the hospital management. This regime promoted cost saving innovations but hindered innovations that improved the quality of health care and at the same time increased cost.

However, it was felt that the implementation of the SABH-concept was rather smooth and quick compared to innovation processes in the public health system in general. Two major reasons may explain the low level of innovation progress: a lack of financial resources for developing and implementing organisational innovations; and lack of vision of hospital management at different levels (which is a probably consequence of the long period of budget cutbacks).

The lack of financial resources for organisational innovation formed the main problem both in the elaboration phase and implementation of the SABH-concept: the rationale for decision makers not to implement the SABH-concept was budget constraint rather than content. The study indicates that in order to support and increase innovativeness the County Council should make budget allocations for the development of new activities. This would also improve the management of innovation processes. Such allocations would give responsibility for managing innovation processes to a level of the hospital management, a problem that obstructed and delayed the innovation process. Despite the small size of the required investment (around 10 million SEK) implementation of the concept involved many individuals from different management levels in the hospital as well as involvement from Council politicians.

The study also indicates that individual incentives to engage in innovative activities in the public health care sector are, to a large extent, found in employees' values and belief systems. The rationale for the instigators was to improve the quality of care. The public health system does not use individual economic incentives to promote innovation - using economic incentives may increase innovativeness among hospital staff.

United Kingdom (Manchester Metropolitan University): "Patient-Oriented Education Systems for Diabetes"

The first UK case study analyses the birth, development and implementation of a novel innovation within the country's National Health Service (NHS): patient-centred diabetes

education. More specifically, the service innovation examined is a novel, high quality, patient-orientated programme of education for type 2 diabetes patients. It is the product of a collaboration between the Salford Primary Care Trust (PCT) Diabetes Education Unit and a group of education specialists at Manchester Metropolitan University. Diabetes is a very common disease with 1.4 million people with diagnosed diabetes in England. Its incidence is rising as a direct consequence of an ageing population - more than 10% of people over 65 are diabetic - and an increasing incidence of obesity. The vast majority (85%) of people living with the disease are diagnosed with type 2 diabetes, which means that they are able to produce some insulin but the levels are not sufficient to properly control their blood sugar levels. Through changes in lifestyle – notably, a healthy food regime and regular physical activity – type 2 patients can control their diabetes. In addition, some type 2 patients will need to take tablets to keep their blood sugar levels within the recommended range. Diabetes can have very serious consequences; these include heart conditions, loss of limbs and blindness.

This innovation is multi-faceted and is best viewed as a set of interrelated innovations rather than as a single innovation. Innovations encountered in the case study thus include conceptual, systemic, policy, and administrative/organisational innovations, as well as service and service delivery innovations. Some of the innovations occur at the policy and service levels while others cut across the policy and service levels. Notably, the concept of patient-centred diabetes education cuts across all hierarchical levels and represents an important break from the traditional, paternalistic model of health service provision and delivery. In the new conceptual frame, the individual patient is the central focus and services are to be tailored to the individual's needs, and delivered at the local level.

The conceptual shift is associated with a radical structuring of the NHS that has occurred in recent years. The objective of this is to create a primary care-led NHS that is responsive to local needs. In addition, a set of key UK policy agencies/enforcing bodies, the National Institute for Clinical Excellence (NICE) and National Service Framework (NSF) standards, have been established to evaluate needs, set and enforce standards of care. Within these, the development of patient-centred diabetes education services is identified as a priority.

These bodies are experimenting with a new approach to policy learning in order to arrive at an effective set of standards for diabetes education. This departs from the traditional model of governmental standards-setting by *de jure*. Instead, a pseudo market for innovation has been established which could support the development of local, bottom-up innovations in services and service delivery. As a consequence, a number of alternative education services ('service packages') are currently being developed in the UK. While the basic understanding (or 'science') of the condition, of diet, and of exercise, are not contested, important differences exist between the alternative service packages being developed and tested. These include significant differences in content, in styles of education, and in modes of delivery. The case study examines the key factors that lead to the generation of this variety at the service level.

Through action research methods, the team was able to gain unique access to innovation processes occurring at the service level. It was been possible to examine, at close hand, the development of a diabetes education programme currently being trialled within Salford Primary Care Trust in the North-West of England. The action research approach enabled the examination of 'critical incidents' that occurred along the pathway of an innovation process. Particular features of this case study are the diffusion and translation of policies into action at ground level, organisational learning by PCTs, the implications of education innovations for staff skills and competences, and the management of change.

United Kingdom (university of Manchester): "NHS Direct: An Innovation in Social Trust – Remote access to public healthcare and the health service".

The second UK case study maps the development of an innovation within the context of the UK public health sector and examines the factors that stimulate, drive, facilitate, resist and disseminate innovation. In this example, the innovation in question is NHS Direct. The case study tracks the origins of NHS Direct and examines the 'critical events' in its development to the current service. Issues such as the pressures, drivers and rationale for its introduction, barriers to its diffusion and uptake and facilitating factors are also considered. The case study is not intended to be evaluative or judgemental of the service, although it does draw on a number of evaluations of NHS Direct, largely to gain information on its sequential development.

The introduction of *NHS Direct* followed extensive debate concerning a wish to combine an old and a new technology (telephones and Clinical Assessment Software – CAS, respectively) in order to deliver healthcare and health service advice to the public. NHS Direct aimed to provide more extensive and cheaper access to healthcare, whilst at the same time alleviating pressure on (hospital-based) Accident and Emergency services and GPs (General Practitioners or 'family doctors'). In essence, NHS Direct is a nurse-led, 24-hour telephone advice service which offers distance-based information (basically, a form of *triage*) to the public and allows them to make better informed decisions on their appropriate subsequent avenue to health care. In this sense, the innovation concerns the ability of CAS to reach appropriate decisions under a wide range of demands, together with issues of public trust, social reflexivity and social empowerment.

At the general level, the introduction of NHS Direct could be said to form part of the UK Government's policy for modernising the NHS. More specifically, it aimed to improve customer satisfaction and patient safety, at the same time empowering patients to make better informed choices about their own healthcare. The fact that the service was also found to have a potential to contribute to wider developments in the NHS may also have played a role in its policy background. However, the extent to which these *a posteriori* policy outcomes shaped the decision making process preceding the introduction of NHS Direct, and the extent to which concerns over the need to improve cost effectiveness of the delivery of emergency and GP services formed part of its policy rationale represented elements for investigation in the case study.

The study revealed a number of key attributes which characterise the overall environment for innovation in the UK public sector, particularly in regard to the publicly funded health system. These are broadly divided into barriers to innovation and drivers or facilitators of innovation. These factors were analysed in the context of the "responses" by which the innovation circumvented these barriers or was otherwise influenced by them.

The Public Health Sector environment

The Public Health Sector

Whether activities are undertaken or delivered by the public sector or the private sector (or indeed the "third sector") is in many ways a matter of historical circumstance. Health services were formerly mainly a matter of private and voluntary provision; telecommunications and broadcasting used to be mainly public services. The ownership and (other aspects of) the

mode of governance[3] of specific services (and other economic sectors and activities) may take various forms, while the services are still considered mainly public or private, depending upon what the "market" or system of entitlements for the outputs happens to be, and upon the structure of their financing. In most cases, even where a service - health, education, policing, etc. - is largely delivered by the state, there are often private and voluntary alternatives available for those financially able and/or politically motivated to seek other ways of meeting their requirements.

In the Nomenclature Générale des Activités Économiques dans les Communautés Européennes (NACE), a classification system of economic activity used in the EU and more widely, activities relating to the public health sector are assigned under the codes **L** (which covers Public Administration and Defence), and **N** (Health and Social Work) - well down the list of economic sectors that begins with extractive industries and then moves on down through manufacturing and private service sectors of the economy.

This classification system effectively embodies the view that the role of the state is in the:

> "Regulation of the activities of agencies that provide health care, education, cultural services and other social services. [In addition, the] public administration of programmes aimed to increase personal well-being: health, education, culture, sport, recreation, environment, housing, social services, etc." RAMON (2001)

Organisations in the public sector are identifiable by the fact that they are shaped continually by public policy; they are regularly governed and regulated in fundamental ways by the state, and in many cases are largely financed by the state or through state allocation of funding. As the historical contingencies mentioned above imply, each nation state may be different from others in terms of precisely what the state governs within each sector under study. Certain functions within the sectors under study may be subcontracted out to voluntary and private providers or may be internalised within the state. For the sake of this study however, the health service sector has been taken to encompass the activities shown in Box 1 below. The cases studies thus largely concentrate on those activities as they are delivered through public sector institutions rather than through private sector parallels.

Box 1. Health Activities

Hospital activities

These include short or long-term hospital activities of general and specialised hospitals [such as] sanatoria, medical nursing homes, asylums, mental hospital institutions, rehabilitation centres, and other health institutions which have accommodation facilities, including military-base and prison hospitals. These activities are chiefly directed to in-patients and carried out under the direct supervision of medical doctors [and include] hospitalisation activities such as: medical and surgical technical care, diagnosis, treatment, operations, analyses, emergency interventions, [as well as support services]… such as boarding, meals.

Medical practice activities

[These includes activities that] can be carried out in private practice, group practices and in hospital out-patient clinics. Patients are usually ambulatory and can be referred to specialists by general practitioners. Included are

[3] Ownership and property rights more generally are themselves specific historical institutions of governance and control.

private consultants' activities in hospitals as well as activities carried out in clinics such as those attached to firms, schools, homes for the aged, labour organisations and fraternal organisations as well as within patients' homes. [These activities are in the form of] medical consultation and treatment in the field of general and specialised medicine by general practitioners and medical specialists and surgeons.

Dental practice activities

These can be carried out in private practice or in out-patient clinics, including clinics attached to firms, schools, etc., as well as in operating rooms. [This category includes] activities of a general or specialised nature [as well as] …orthodontic activities.

Other human health activities

This class may include the activities of nurses, midwives, physiotherapists or others in the field of optometry, hydrotherapy, medical massage, occupational therapy, speech therapy, chiropody, homeopathy, chiropractics, acupuncture, etc. Activities may be carried out in health clinics such as those attached to firms, schools, homes for the aged, labour organisations,… in residential health facilities other than hospitals, as well as in own consulting rooms, patients' homes or elsewhere… by paramedical practitioners legally recognised to treat patients. [These also include] activities of: dental paramedical personnel such as dental therapists, school dental nurses and dental hygienists ; activities of medical laboratories; activities of blood banks, sperm banks, transplant organ banks; ambulance transport of patients [and other activities including screening which may or may not rely upon sophisticated instrumentation and/or highly technically skilled staff (e.g. breast cancer, TB, etc.), and may be performed by mobile units or equipped individuals.]

Source: RAMON (2001)

The public service institutions are typically surrounded by a variety of alternative or complementary private and voluntary initiatives. More relevant to this study, they are also surrounded by a mix of public, private and voluntary organisations that are largely orchestrated by the activities of the major health and public administration providers. Some of these are agents in the "supply chain" of the public organisations; some are less closely integrated (perhaps reflecting the role of regional or local agencies, for example). The consequence is that a wide range of organisations may be involved, and may need to be studied when considering innovation processes and the associated policy learning in the health service public sector. Such organisations may include service providers, policy agencies, quangos (quasi-autonomous non-governmental organisations) ministries responsible for policy making, or other organisations owned by the state or other public authorities.

Common themes in the public health sector[4]

Across Western Europe, a number of issues are shaping the way in which healthcare is formulated, delivered and assessed. In essence these drivers of healthcare policy fall into two main groups; those that derive from changes in the characteristics and demands of the population itself and those that represent managerial responses in order to deal with such changes and demands. These drivers therefore underpin many of the changes and innovations encountered across the public health systems of Europe. The most significant include demographics, an increase in chronic diseases and long-term conditions, consumerisation, patient empowerment, public trust in expert opinion, the privatisation of services and the introduction of and New Public Management techniques in the public sector, and a shortage of healthcare professionals.

[4] This section is derived to a great extent from the MMUBS case study.

The following sections provide further detail on these drivers for change. Much of the information is drawn from the example of the United Kingdom, but is typical of the situation in many other developed world economies.

Demographics

With few exceptions, globally changing birth patterns, together with a general decline in mortality rates (often, paradoxically, due to improvements in healthcare) have led to an increasingly ageing population and a commensurate rise in total health costs. For example, in the UK in 1971, 13% of the total population were over of people over 65. By 2003 this figure had risen to 16% and by 2030, forecasters suggest that one in ten of the population will be 75 or over.

To pursue the example of the UK, the greatest problems stem from the over 80s who represent a major cost to the National Health Service (NHS). Currently representing 4% of the total population, their number is growing faster than the over 65s. At the same time, the number of young people is set to be around 20% lower than it was 20 years ago (Bosanquet, 1999). The working age population is also due to fall in size when the so-called 'baby boomers' (those born in the immediate post Second World War era of the mid- to late 1940s) and move into retirement, as a relatively smaller number of people have been born since the mid-1970s (ONS, 2004). Under a transfer of payments system, a shrinking work force is required to pay ever higher taxes to cover this ageing population. Yet the tax burden cannot be increased without limit.

The problem is compounded by the rising cost of medicine - it costs substantially more to provide good quality health services, and earlier detection means the pathway of treatment is longer. Under such conditions, in the UK, the long term survival of state-provided healthcare has been questioned. Its continuation will probably be tied to changes in the age of retirement. Further, there may be a need for members of the working population to increase their savings and cover part of their own health costs through private insurance, as is the case in the United States and in some EU countries (such as the Netherlands). However, even in these countries financial pressures have imposed budgetary restrictions. Unfortunately, savings amongst the current UK working population are *falling* and they are not investing in private health insurance schemes. Further, poor returns in stock markets over the last decade mean private and company pension schemes are not meeting expectations, compounding the problems for newly retired workers.

At the same time, governments and, hence, the healthcare institutions under their responsibility are increasingly confronted with rising expectations for performance improvements. These arise from a variety of stakeholders including tax payers, politicians, regulatory authorities, healthcare professionals, patient lobby and interest groups, and insurance companies. The desired improvements encompass both cost reductions and raising the quality of care, working life and patient satisfaction. Healthcare professionals face a demand for win-win solutions which deliver more cost- and medically-effective treatments with increased patient satisfaction.

Allied to these factors, and of particular relevance to the Irish case study, is the changing structure and role of the family, which has split from the traditional nuclear family to a more dispersed and less mutually supportive entity. This has shifted the burden for the care of the elderly (irrespective of their healthcare needs) away from the family and relations to the state.

The costs of this shift have also been accompanied by financial implications, with a rise in the practice of means-testing in order to ascertain eligibility for 'free' health care.

Increase in chronic diseases and long-term conditions

Aside from the growth of age-related health problems and despite the efforts of national governments to provide people with healthcare advice, including campaigns to assist people to give up smoking, to have healthier diets, and to adopt healthier lifestyles in general, there has been an upward trend in the developed world of chronic diseases and long-term adverse health conditions. Thus, there are currently 17.5 million people with long-term medical conditions in the UK, of which 8.8 million are chronic. This is due to the growth in obesity (leading to a growing incidence, for example, of diabetes and heart disease), lack of exercise, poor diet, smoking, and rising alcohol consumption. Multiple long-term conditions make care particularly complex, and a small number of patients and conditions account for a disproportionate amount of health care use. Indeed, the majority of UK GPs' visits are related to chronic disease, and more than 60% of hospital beds are occupied by people with chronic diseases.

Early and effective treatment is thought to be the way forward, coupled with preventive measures to avoid or delay the onset of illness. This requires two things:

- a long-term view rather than short-term political expediency, and
- a holistic approach with associated integrated services across primary and secondary care that allows patients to gain control over their condition.

Ironically, recent changes in the organisation and structure of the NHS have produced an array of new public and private sector institutions which actually makes the achievement of the second goal more difficult. For example, the MMU case study in the area of diabetes uncovered a bewildering number of bodies concerned with the condition. The links between these bodies is unclear to patients, and sometimes to health care professionals. Hence it has been suggested that UK patients need to fit within an existing set of fragmented systems, rather than a set of services being integrated around their needs.

The first of the above goals, whilst laudable, is unlikely to occur in the near future. For example, the NHS remained a prominent political issue during the 2005 UK General Election and there is a strong desire on the part of health ministers to be seen to be acting positively on the system whilst in power. The role of political pressure in driving through change and innovation is clearly visible in the second UK case study on the implementation of NHS Direct.

Consumerisation

It is often suggested that public expectations of the public health care system are ever increasing – certainly concepts such as 'patient satisfaction' have gained currency in both the professional and popular media. At the same time, it is suggested, users have become highly sophisticated and demanding, so much so that they are no longer 'patients' but 'customers'. This has given rise to a new relationship between health practitioners (family doctors, hospital doctors and consultants, and nurses) and users; one that is more akin to private sector services. The public is no longer willing to behave as submissive patients, and are more likely to complain when services fail to meet their expectations (either directly, through patient

interest groups, or through political representatives) or even adopt legal proceedings when errors are made. At the same time, the responsibilities of officials such as the Health Service Ombudsman, in the UK, have made recourse to the legal process more accessible.

The change is said to be driven by a number of factors. One factor is a shift in attitude, partly driven by the influence of the USA (where litigation is now common practice). Another factor is the growth of the internet as a source of medical information. The reason for the internet's popularity is easy to appreciate as it presents an opportunity for people to go beyond their doctor to gain information about conditions and treatments when, and from as many sources as they want (Cumbo, 2001).

In practice, strong caveats need to be placed on these notions of consumerisation, which may not be universally applicable. For example, in the MMU diabetes education case study, it was found that the majority of diabetes sufferers do not view themselves as customers, nor do they wish to become empowered customers, preferring instead to remain passive recipients of the medical services determined by their GP and other medical practitioners. In other words, they prefer to remain traditional 'patients'. This may reflect the economic and social demographics of the residents within the case study region, who are invariably poorly educated and economically disadvantaged and whose age means they do not tend to be internet users, or have an interest in gaining access or learning how to use the internet. This was found to have important implications for the design and delivery of a patient-orientated education programme at the service level. Thus healthcare innovations are also faced with the task of trying to change users' basic beliefs and expectations, for both treatment and for information and advice.

Patient empowerment

Closely linked to the above issues is the notion of individual 'empowerment', whereby the customer takes on responsibility for the management of his/her health condition. Governments have been keen to place greater emphasis on the responsibility of individual 'health service consumers' to take greater care of their own health. As yet, there is no political consensus about the appropriate balance between societal and individual responsibility, however, in the UK, the Labour Administration withdrew the *Patient's Charter for England* – a list of rights and entitlements drawn up by the previous Conservative government in 1991 - and replaced it with a new document, *Your Guide to the NHS*, which emphasises patients' responsibility to look after themselves.

Whilst individual empowerment appears to be a positive move, it presumes that patients have the knowledge and understanding to actually make informed choices and ignores possible tensions between medical issues (from clinical emergencies to the use of 'alternative' remedies for the treatment of chronic conditions) and the capabilities of patients to react in the correct manner. Users face serious problems in terms of both understanding new medical evidence and gaining access to validated sources. The issue of the "informationally disadvantaged", i.e. those who do not have access to modern sources of information such as the internet, also applies in this context. In addition, the non-immutable nature of medical knowledge is thought to be linked to a decline in the public's trust of the medical opinion of healthcare professionals. There is also often an assumption that patients are themselves willing to become more empowered, whereas, as at least one of the case studies indicates, this may not in fact be valid. Thus, there is a strong set of countervailing arguments which militate against the policy for greater patient empowerment. A number of the case studies cite

the issue of patient empowerment as a driver for change; hence it is particularly relevant in the context of this study.

It may be argued that patient empowerment is a rhetorical means of shifting responsibility for health care from government to the patient and that the consumerisation of users is being used by the state to offset its own responsibilities, given the increasing pressures faced by the health system. The rationale for giving patients a greater role in their own welfare may stem from problems associated with an ageing population and the increasing prevalence (and costs) of chronic conditions. However, empowerment does not represent a cheap option and may well engender higher costs, at least in the short run, in time and resources, than the paternalistic system it replaces. Even over the longer term, empowerment (and other innovations) may cost more than the status quo and there is a need for such replacements to demonstrate benefits other than those linked to economic concerns, such as improved quality of life.

Decline of public trust in expert opinion

Generally, over recent decades there has been a steady erosion of the public's trust in figures of authority, including politicians and healthcare professionals. For example, data from UK polls indicates that the proportion of people who say they trust government has more than halved over the last 30 years (Hewitt, 2005). Various reasons are cited for this but three main influences appear to be:

- a decline in deference accorded to those in authority, coupled to a growth of cynicism towards the desire to hold public office;
- the revolution in information and communications which may be used to challenge those in authority or alternatively, in the face of a plethora of contradictory statistics, can be regarded as "spin" when used by those in authority;
- the rise of a more individualistic society and a greater emphasis on the authenticity of personal experience.

However, in the health sector in particular, the picture is far more complex. Some might assert that health practitioners (GPs, hospital doctors and consultants, and nurses) are far less respected in society than they once were. This is based on the view that the rate of scientific and clinical discovery is so fast that it is hard for any individual to stay at the leading edge of knowledge - health advice is subject to change – and as a consequence the general public (and key elements of the popular media) increasingly question the validity of the knowledge and competences of health practitioners. Also, in the UK and France, for example, several well-publicised cases of malpractice have further eroded the public's confidence in the health sector.

Nevertheless, recent opinion polls present contradictory evidence. A 2002 MORI opinion poll showed that the public's trust in doctors was at a twenty year high. Despite a series of high profile stories about healthcare and the state of the NHS, 91% of people thought that doctors tell the truth, making doctors the most trusted of the professions and occupations listed, with a mere 6% of the opinion that doctors do not tell the truth. The same proportion (91%) of people was very or fairly satisfied with the job done by doctors.

A similarly mixed message also comes from the National Centre for Social Research; its 2003 UK Social Attitudes Survey tracked a decline in satisfaction with the NHS. In 1983,

55% of UK citizens surveyed said they were satisfied with the NHS; by 2003 this had fallen to 40%. Over the same time frame the proportion dissatisfied with the service rose from 25% to 41%, despite an increase in government spending, from £15 billion in 1983 to £65 billion in 2003, and a reduction in average waiting times from 10 months to 4 months. On the other hand, people were on the whole satisfied with their GPs, with almost 75% stating they were happy with their doctor. Conversely again, the number of people being satisfied with the dental service had dropped from nearly three quarters in 1983 to around half twenty years later. Generally, those who had had recent experience of the NHS were more satisfied than those who had not had contact with it for some time.

Privatisation and New Public Management

The 'crisis of the State' in the 1970s, combined with demographic pressures formed a key driver in the search for greater efficiency gains in healthcare, largely as a solution to the increasing financial burden placed on the State. In the UK, for example, the increasing significance of health as a key political issue was illustrated by the unprecedented appointment in 1997 of a Minister of State with specific responsibility for public health.

In the UK, there has been significant change in the attitude of central government to the NHS since the early 1980s. This is evidenced by the following:

Firstly, there was a significant review (and continued questioning) of the boundary of state and private sector provision. This trend effectively started under the Thatcher government where there was a move to significantly 'pull back the boundaries of the State'. Privatisation policies increased the number of pay beds, encouraged the management of NHS hospitals by private firms, led to the closure of uneconomic hospitals and the sale of residential NHS accommodation, introduced private sector auditors, and drove the contracting out of ancillary services. As well as boosting the private medical sector, privatisation opened new markets for firms providing a variety of non-medical services. Currently, around 10% of people have private health insurance in UK. In addition, 220,000 people paid for their own medical treatment in 2004. While the first Labour administration sought to rein back aspects of the private sector when it came to power, the issue remains at the forefront of the current government's policy drive.

The second issue concerns the introduction of private sector management practices in the public sector. The search for greater efficiency with public sector health provision by national governments has led to the introduction of new tiers of middle management using management practices and styles taken from the private sector, and an institution-wide restructuring of public sector agencies. Now termed New Public Management (NPM), the debate on the use of these practices has formed a significant international trend in public administration over the last 20 years or so. The degree attention it has elicited may be partly explained by the loose definition of NPM, and partly by the strong emotions it provokes among researchers, politicians and bureaucrats (Røste, 2003).

A significant body of literature exists on NPM and readers are referred to Røste (ibid.) for a more detailed treatment. As she notes, discussions concerning NPM are typified by some or all of the following characteristics:

- "*Private sector styles of management principles*: a move away from bureaucracy-style to greater flexibility and new techniques.

- *Competition* in public sector: rivalry is the key to lower costs and better standards. Use of public tendering procedures and term contracts.
- *Disaggregate units*: break up formerly monolithic units and create manageable units where production and provision interests are separated. Efficiency advantages of use of contract or franchise arrangements inside and outside the public sector.
- *Hands-on professional management*: active, visible, discretionary control of organizations from named persons at the top. Accountability requires clear assignment of responsibility for action, not diffusion of power.
- *Explicit standards and measures of performance*: definition of goals, targets and indicators of success, preferably expressed in quantitative terms. Accountability requires clear statement of goals, efficiency requires "hard look" at objectives.
- *Output controls*: need to stress results rather than procedures. Break-up of centralized bureaucracy-wide personnel management, resource allocation and rewards linked to measured performance.
- *Discipline and parsimony*: need to check resource demands of public sector and do more with less. Cutting direct costs, raising labour discipline, resting union demands."

Taken from Hood, 1991.

A third trend is characterised by a tendency towards greater direct control by government. In the UK, for example, managers within public sector organisations and the NHS in particular, are required to meet targets specified by oversight bodies established by central government. There has been an important change (and continuing tensions) in the relationship between the government and health practitioners, underpinned by a shift in real power. Under the new NHS structure, power is maximised at the top while responsibility for implementation is minimised. By contrast, responsibility for delivery is maximised at the local level while power has been minimised.

Shortage of healthcare professionals

Allied to the pressure on financial resources resulting from demographic and health status factors, public services in general report an erosion of pay scales in comparison to the private sector, a decline in the (actual or perceived) status of public sector professionals, and the loss of independence as government exerts greater direct control. Health services may also encounter difficulties in attracting quality staff and professionals. In the UK public health sector, an increasing number of GPs and nurses now choose to opt out of the NHS altogether and to work solely in the private sector or, in the case of the latter to abandon nursing altogether. Consequently there is a major shortage of healthcare professionals, with associated tensions and pressures at service delivery level. Solutions have been sought in attracting foreign doctors and nurses on short-term contracts while expanding the numbers of nurses and medical students in UK universities. So this policy is being undermined by poor retention rates.

Drivers, facilitators and barriers to innovation

The major pressures and influences on the public health sector outlined above will clearly impact in various ways on the process of innovation within the sector. In order to link their

effects to the innovations examined in the case studies, and to be able to draw more general lessons, it was necessary to derive a set of more specific influencing factors. This was done through a series of interviews with stakeholders from the health sector with a close interest in the process of innovation and change. This led to the identification of a generic set of factors which, either actually or potentially, will impact the inception, development, implementation and eventual success of innovations. These may be divided into: barriers, which typically hinder the process of innovation, drivers, which typically underpin the rationale for innovations, and facilitators, which assist in the overall process of innovation.

Barriers

The public health systems studied appear to share a number of common features which could act in a way to hinder or prevent the process of innovation. Although a number of categories have been identified, they are rarely mutually exclusive and one barrier may be the cause or effect of one or several others in a complex interplay.

a. *Size and complexity:* Typically, the public health sector comprises an extremely complex and large-scale organisational entity, composed of multiple-tiered interlinked systems. In turn, these often exhibit: huge staff numbers[5]; a large range of professional, semi-professional and ancillary occupations; and a diversity of organisational arrangements and service processes. This size and complexity can generate additional factors that hinder the innovation process, such as localised skills shortages and gaps, lack of clear agreement with respect to perceived problems, approaches and solutions, and communication (particularly knowledge management) difficulties. Typically, such large-scale organisations are prone to the development of internal barriers (the "walls and ceilings" of the Dutch case study) and, in the worst case scenario, the development of "silo mentalities" wherein parallel systems maintain their own organisational norms, beliefs and practices with little communication with each other. Such systems are highly unlikely to communicate the need for innovation within themselves and will militate against the successful dissemination of innovative ideas and practices.

b. *Heritage and legacy:* Public sector organisations are frequently prone to entrenched practices and procedures – that which has worked in the past is seen as good practice and there is frequently an attitude of "if it isn't broke, don't fix it". The systemic impact of innovation and change is often viewed as an unwelcome perturbation to the overall functioning of the organisation and change and new operational methodologies may be discouraged. Similarly, there may also be a tendency to adopt the "not invented here" attitude with an unwillingness to accept novel ideas from outside the immediate organisational peer group. Again, these factors will militate against the inception of innovations and their dissemination.

[5] For example, the UK National Health Service is the largest public sector employer in Europe.

c. *'Professional' resistance:* Public health systems comprise a number of distinct and well-established professional groupings, with their own communities of practice, rationales, and perspectives. These tend to adhere to their established roles, and associated policy agendas. Parts of the public system may operate according to differing command and control structures. There may hence be a reticence to embrace change and innovation. A lack of dialogue between different parts of the public system, horizontally or vertically, between different professional groups may also hinder innovation and its dissemination. Thus, different medical professions may be unwilling to accept the ideas of others, even if both share similar professional status (for example, surgeons and anaesthetists), whilst the problem may be exacerbated between members of (perceived) hierarchically separated professional levels (for example, gynaecologists and midwives, or doctors and ambulance staff). A further barrier concerns problems of non-ownership of ideas and resistance to disseminate "good ideas" that may be appropriated by others – similar to the "not invented here" phenomenon mentioned above under heritage and legacy. At the technical level, this may translate to problems over the ownership of IP.

d. *Risk aversion:* There is an understandable inherent resistance (which is particularly strong in the medical professions) to undertake or implement changes which may result in an increased probability of risk (to the patients in their care or to the other recipients of their services). The emphasis placed on the development of evidence-based medical and clinical practice over recent years is one consequence of the health professions' desire to minimise the unforeseen consequences of new health interventions. The definition of innovation implies novelty with its attendant lack of pre-knowledge on the possible outcomes. Moreover, innovations are rarely isolated phenomena and often depend upon, or engender, further changes and innovation leading to a ripple-effect across the entire system in which they are applied.

e. *Public/political profile and accountability:* The health sector has a professional and public duty to deliver the highest possible standards of care. As a result, health is a major political issue and the shortcomings of government health policies often form the focus of political, and hence, media debate. Likewise, examples of medical malpractice and maladministration are seized upon by the popular media in its search for news material. Consequently, public service managers and politicians are very wary of enacting changes that may result in negative outcomes, particularly if there is the risk that these will attract media focus. There may also be a tendency towards a blame culture, with its associated high levels of accountability. Added to this is the risk of patient litigation in the event of adverse impacts and events. These features contribute to the broader notion of risk aversion already described above and could further hinder the process of innovation.

f. *Need for consultation, and unclear outcomes:* Further allied to the issues of the lack of pre-knowledge associated with the introduction of novel medical practices and procedures, and that of risk aversion, the large range of stakeholder involvement within the health sector generates a strong requirement to consult and review any planned changes and modifications and to attempt to identify all the potential consequences of such actions. This is exacerbated by the complexity of the health

system and difficulties with obtaining a clear picture of all the eventual effects of these actions. Thus diffusion or roll-out of new innovations forms a major management issue. A related problem concerns the systemic nature of innovation, i.e. the possibility that the introduction of one innovation may shift the underlying problem to another, downstream, part of the system or may have unforeseen and adverse consequences. Thus, the introduction of any innovation should require close *ex ante* assessment, coupled with careful review and evaluation.

g. *Pace and scale of change*: Many public administrations, for a variety of political and policy reasons (such as the introduction of New Public Management approaches), have over recent years been subject to a large number of often radical changes. The pace of change has also been dramatic and this has led to an environment of shifting targets and the absence of adequate opportunity to reflect upon and assess the consequences of many of the innovations introduced. The introduction of new political ideologies, new 'world views' etc. may also accelerate the pace at which policy makers (at all levels) wish to see change implemented. Thus, while political will may be viewed as a driver for innovation and change (see below), the systems to which it applied may become "innovation-fatigued" and resistant to further change.

h. *Absence of a capacity for organisational learning (at all levels)*: There may be a lack of structures and mechanisms for the enhancement of organisational learning, exacerbated by their scale and complexity and the problems these features generate (see above). If there is a lack of dialogue between the actors in a complex system, for a variety of reasons such as legacy and professional resistance, how can the diffusion of good practice be managed? Frequent reorganisations (see "g. pace and scale of change") will also promote a lack of corporate memory. This problem can operate at all levels from the top of the policy-making hierarchy down to the service delivery level.

i. *Public (and end-user) resistance to change*: There is an assumed general resistance of the public to reorganisation and changes in the way healthcare and other public services are delivered. Thus, the public, or elements of it, may also be risk averse. Various factors may operate here such as age, ethnic background, personal wealth, access to ICT, etc. It is assumed that the public forms the typical end-user, although it may be represented by various lobby and interest groups. In some cases, perhaps where the mode of delivery is changed with no discernible change to the service or 'product' from the public user's perspective, the end-user may be the service deliverer.

j. *Absence of resources*: This feature has been clearly identified within the general factors affecting public health systems, particularly those associated with demographic changes and disease conditions. Not only does it include a lack of financial support, either in a general context or specifically for the support of innovation, it can also include shortages in relevant skills or other support services required for the implementation of innovations. As noted above, the systemic nature of the impacts of innovation, whilst relieving pressure on one part of the system may result in a shift of the problem or bottleneck to another part of the system. Moreover,

the general desire to improve the quality of health provision often entails the need to expend additional resources – not all health innovation is aimed at economic efficiencies.

k. *Technical barriers*: Whilst the development of a new technology or technological application may serve as a strong driver or facilitator of process or organisational change, the absence of a technology which exhibits certain specifications may also hinder the development of a sought-for innovation. Thus, the application of new uses to existing equipment, for example, may push the technology to the limits of its capabilities and act as a driver for further technical innovation.

Drivers and facilitators

A number of counters to the barriers noted above may also be discerned. These may be categorised as drivers for (i.e. pressures for innovation) and facilitators (i.e. factors which aid the uptake and dissemination of innovation) in the public health system. Again, these may operate either at the national level, in the broad environment of the innovation or may be specifically linked to the innovation itself.

a. *Problem-oriented drivers:* It is clear that many innovations in the public health sector are introduced in response to one or more specific problems. Typical underlying causes, as noted above, include demographic factors, ageing population, fragmentation of families, life-style health and social problems, etc. Thus, an innovation may be required to deal with new specific problems (i.e. the rapid increase in child obesity), or with generic problems (such as the need to reduce in-patient resident times as a means to free up hospital beds), or to speed up the processing of health care administrative tasks.

b. *Non-problem oriented improvement:* Innovations may also be introduced because, rather than dealing with a specific problem, they represent an improvement on the former situation. For example, doing things faster or more efficiently is generally a broad goal but does not necessarily represent a specific problem in itself. Similarly, a new medical technique may confer improved quality of life for patients but may not offer any further advantages.

c. *Political push*: Strategic change in the public sector frequently requires a strong, top-down, political will coupled with the political recognition that change requires the allocation of substantial resources. This may be ideologically based or in response to critical events and pressures. It may also include the adoption of new world views and concepts – thus, in several countries successive political ideologies have sought to find free-market solutions mainly to ameliorate the enormous financial burden imposed by a “free” (at point of delivery) public service and also, indirectly, to provide incentives for improved service delivery. At the delivery level, political goals may be reflected through the imposition of performance targets (which may facilitate innovation although with the danger that, as with most indicators, they can distort the

behaviour of actors within the system in unanticipated and possibly undesirable ways) – see Competitive drivers, below.

d. *Growth of a culture of review*: A range of assessment practices have developed over the years in the public sector (especially in the health system), ranging from evidence based guidance, health technology assessment, and clinical audit through to broader scale review activities. The development of these techniques could, at least in theory, alleviate the problems associated both with assessing the potential impacts of innovations and with promoting a culture of organisational learning, hence this feature may represent both a barrier to and a facilitator of innovation.

e. *Support mechanisms for innovation*: This can represent the allocation of appropriate resources (finance and other forms of support) to promote innovation and its implementation. Allied to the allocation of resources is the provision of actual structures and systems designed to promote, stimulate or disseminate innovation (e.g. staff suggestion boxes, staff fora, stakeholder feedback mechanisms, networking activities, competence building, encouragement of alternative thinking, etc.). These may operate either from the top-down or from the bottom-up. Both mechanisms may also monitor external sources, such as practice in other public service systems either domestically or abroad for transferable examples of innovations.

f. *Capacity for innovation*: Staff in the public health system are often characterised by their high levels of professional expertise, exhibiting a high level for creativity and problem solving, thus providing an environment in which innovation should both be generated and accepted. This is frequently demonstrated by the presence of entrepreneurs or "innovation champions" who drive forward the process of innovation and its implementation and diffusion. Moreover, medical and health professionals are generally driven by a strong desire to improve the well-being and quality of life of the patients in their care, which may further prompt the search for new solutions and approaches.

g. *Competitive drivers***:** The use of performance targets to derive "league tables" (for example, of hospitals, schools and universities, in the UK) can encourage the use of innovative approaches in order to force up performance ratings. However, the use of such targets, indicators and league tables often distorts operational behaviours, sometimes with unintended and deleterious consequences (such as the refusal of GPs to operate accessible appointments systems in order to drive down waiting lists). Therefore, this is one example of a driver which may force innovation to operate in non-optimal ways.

h. *Technological factors:* It is clear that technological innovation can be a strong determinant or driver for subsequent innovation. The introduction or availability of new technology (for example, telemedicine or advanced data storage and handling capabilities, etc.) may provide an opportunity for another form of innovation (process, organisational, delivery, system interaction, etc.) to take place or to be implemented.

Analysis of the case studies

Analytical frameworks

As may be seen from their summaries, the case studies exhibited significant variation in their national and public sector contexts, institutional or system level settings, and with regard to the type and nature of the innovation they represented. In order to derive a common approach to the analysis of the case studies, the above sets of barriers, drivers and facilitators were used as the basis of an analytical framework by which each case study could be examined and common themes and areas of resonance identified. The analytical frameworks for the six health sector case studies are attached as Appendix 1.

An analysis of the occurrence, impact and relevance of each of the barriers, drivers and facilitators is presented in the following sections.

Barriers

Size and complexity of system

Generally, this feature was shared by all of the case studies although its impact was perhaps greatest in the UK, and in particular in the example of the introduction of NHS Direct. As this innovation was implemented at a nationwide level, the problems of overcoming the barrier imposed by a large and complex set of organisational hierarchies was significant and was overcome to some extent through the use of a phased introduction through a series of regional pilots. This approach effectively scaled down the problem by dealing with a more restricted set of actors and stakeholders. It also enabled the introductory phases to respond to regional and local problems and conditions. Similarly, the innovation studied by MMU (diabetes education) was implemented at a local level and was thereby protected from this barrier, although the need to engage all stakeholders in an extensive process of dialogue implies that the complexity of the system even at the local level was influential.

In the Irish case study, the size and complexity of the system was evidenced through the disconnection between budgets and practice, which formed a contributory factor in the need to develop a new system for the provision of home help. However, the impact of this factor on the innovation process itself was minimal.

Although the remaining case studies all occurred within a single institutional environment – a hospital – size and complexity was found to act, to varying extents, as a barrier to innovation. In the Netherlands' case study, the size and complexity of the health system in a general sense was reported to militate against the establishment of clear channels of communication and cooperation and resulted in the formation of functional and professional "silos". The Swedish innovation took place in a newly merged hospital which was reported as "huge" although the specific effects of this feature were not reported. Paradoxically, in Spain, the decentralisation of the national health system to a more regionally autonomous system has led to a loss of economies of scale and the emergence of regional inequalities, apparently increasing the heterogeneity of the system and, hence, its complexity. These features were not reported as having a direct impact on the implementation of the studied innovation itself, however.

Heritage and legacy

The effects of this potential barrier to innovation were reported in both the Dutch and the UK contexts. In the Netherlands, the case study noted the existence of rigid financial systems together with entrenched management procedures and viewpoints. The main impact of these features on the innovation itself (introduction of clinical pathways) was that hospital employees tended to remain attached to their original situations, loyalties and rationales. The implementation process of the innovation itself had utilised the targeted removal of functional silos (see 4.2.1 also) and it was also noted, although this had not been carried out at the time of writing, that personnel changes in the upper management of key stakeholder bodies could have potentially improved the level of cooperation between these bodies and the clinical pathway implementation team.

One interpretation of the Spanish case study is that heritage and legacy effects could be perceived as a general resistance to change which was promoted by a lack of monetary incentives.

In the UK, heritage and legacy effects form a strong feature of some areas of the public health system. The implementation of NHS Direct, however, overcame these effects in three ways: though the strong, top-down political pressure exerted to push through the innovation, through the use of local champions to drive the innovation at local level and to engage with and convince other stakeholders, and through the encouragement of local problem solving and the open remit accorded to the management of the regional systems. Similarly, the Swedish case study (home-based post-hospital child care) noted that the success of the project had depended strongly on the ability of the management team to be able to operate independently and to find new ways of doing things.

‘Professional’ resistance

Every case study in the health sector noted this as one of the barriers against innovation and change. In Ireland, it was expressed both as a professional concern over the lessening involvement of families in the area of elderly care and also a more pragmatic concern over pay differentials between the various classes of health care professionals. The resistance was not always a “blind” objection to implement change: there was genuine concern over some of the apparently unrealistic restrictions on the service delivery conditions. As such, professional resistance need not always represent a negative barrier to change for its own sake but a way of expressing professionally based reservations over new, untried, ways of operating. However, there was also a lack of “buy-in” by some professionals due to a more entrenched form of resistance. It was noted that perhaps such resistance might have been ameliorated by the presence of a ‘champion’ or entrepreneur figure, but none was identified in this particular case study.

Both the UK case studies reported professional resistance. In particular, some GPs were resistant to the delivery of diabetes education and care, whilst, at a more general level the same group of professionals, were sometimes resistant to the concept of NHS Direct. The latter also elicited resistance from a broader spectrum of health care professionals for a variety of reasons, but particularly because of its unknown consequences. In the example of NHS Direct, such resistance was largely overcome through a considered process of integration with local systems, a demonstration of the benefits of the innovation, particular with respect to a lowering or at least neutral effect on demand for GP services, and through

the emphasis of the benefits in terms of customer empowerment, at least in certain sections of the public. However, it should be noted that resistance from some GPs was still in evidence.

In the Netherlands, conflicts of interest were reported between care providers and other professional groups. There was also a reluctance to lose professional autonomy, particular amongst medical staff and also a reluctance to engage with stakeholders external to the immediate environment of the hospital. In the case study, these factors resulted in the withdrawal of one participant group (the organisation for ambulant mental health care) largely because of an absence of cooperation and trust. They also led to problems with poor communication and cooperation between various professional groups and were even demonstrated at the individual level, for example, on the hospital board where a mismatch of personalities and a fear of loss of autonomy were noted. All of these factors led to a very strong demarcation between the supporters of the innovation and those resistant to it. Interestingly, another potential barrier, that of financial pressure acted as a driver in this example and forced cooperation amongst some stakeholders.

The Swedish case study also noted professional resistance, again from elements of the hospital management some of whom were strongly opposed to the innovation. In addition, some professional staff based their resistance on their view of the innovation as "luxury paediatric care". In contrast, the Spanish case study noted that professional resistance was prevalent amongst the lower paid and lower skilled hospital ancillary staff which prompted some negative attitudes to the Digital Radiography innovation. In this case, the barrier was overcome once it had been noted that hospital doctors had accepted the benefits of the new system.

Risk aversion

This factor was reported in only two of the case studies, although it would be anticipated to be a common feature in most countries' health systems and may have underpinned the much more widely encountered issue of professional resistance noted in Section 4.2.3. In the UK, risk aversion is noted particularly at the local and individual level, with healthcare professionals being unwilling to adopt new, untested or unproven practices. Similarly, the notion of risk aversion was noted as a feature of the Swedish health system. More specifically, in the Swedish case study, hospital and regional health authority management were averse to the implementation of innovations, largely on the basis that they entailed higher costs even if they brought an improved quality of care. At the service delivery level, some of the medical staff was concerned that the new system would contain an element of medical risk.

The issue of risk aversion was overcome in the NHS Direct example through a number of features. As NHS Direct was a strongly top-down driven initiative, there was an accompanying upward shift of responsibility, thus if things did go wrong, higher level management and civil servants would, in theory, have taken the blame. By introducing the initiative as a series of phased pilots, the overall level of risk was minimised and contained to a regional or local level. The initiative also embodied strong feedback loops at the local level, thus could detect and respond to problems quickly, if required. Also, there was a strong emphasis on the implementation of safety checks, particularly with regard to the diagnoses produced by the Clinical Assessment Software (CAS). Finally, with specific regard to the CAS, the use of hands-on, local amendment of the software protocols was strongly encouraged.

Public/political profile and accountability

This feature appears as a barrier to innovation in several of the case studies. At the general sectoral level in the UK, over recent years there has been a move towards more direct control by Government and greater accountability to guidelines imposed by bodies such as the National Institute for Clinical Excellence (NICE) and through the National Service Frameworks. This has been countered by a tendency to allow greater operational responsibility at the local and regional levels (whilst adhering to the national guidelines just mentioned). Thus, in the MMU diabetes education case study, the local team had a large degree of flexibility in formulating their approach, whilst in the NHS Direct case study regional autonomy was combined with a strong system of feedback loops and consultative arrangements intended to minimise risks ands uncertainty. It was also noted that, with regard to political accountability, politicians were often more inclined to enact major "headline" reforms and initiatives that would contribute to their political legacy rather than instituting a series of minor incremental changes. Whilst such an approach carried a certain degree of political risk, it was felt that politicians were able to move to new portfolios with little attendant 'memory' of their previous mistakes. In the NHS Direct case study, the responsibility for the rapid implementation of the innovation had been readily assumed by Ministers, particularly once some early successes had been noted.

At a more specific level, in the Dutch example, public accountability was manifested as a strong public system of financial regulation and control over regional health sector budgets. One of the consequences of this regulatory framework was the emergence of a crisis over the financial information requirements provided by the hospital and the resultant imposition of a 15% budget cost. In addition, policy makers' trust in the new organisation was undermined by the successive disclosure of a number of institutional problems. Thus, although these financial problems were not directly caused by the innovation, the perception of accountability hindered its overall development.

Need for consultation, and unclear outcomes

Many of the case studies reported this factor as a consideration in the implementation of innovations in the public sector. In Sweden and Spain, in particular, this issue was strongly linked to financial regimes and budgetary restrictions national, whilst the UK and the Netherlands tended to link it more closely with medical rather than economic uncertainties (i.e. the trend towards evidence-based practices) – indeed the fact that that the procedures introduced for the Dutch clinical pathways innovation were not strictly evidence based actually provoked professional resistance: there was little experience of the use of such procedures either in the hospital itself or in Dutch mental health care practice whilst the use of empowerment-oriented organisational development was also a novel approach. Similarly, a major barrier to the Swedish SABH innovation was the inability to foresee that it would both improve the quality of child patients' care and reduce overall operating costs.

A process combining some or all of the elements of research, review and evaluation was utilised in several case studies as a means of overcoming the inherent uncertainty associated with change and novel approaches.

In both Ireland and the UK (NHS Direct), the use of a phased pilot approach was noted as a way of minimising risk. Although little advance consultation was carried out for NHS Direct, and while evaluation of the first-wave sites was performed but limited time was offered for the dissemination of the results and lessons, these shortcomings were balanced by the

establishment of strong feedback practices and the strong consultative arrangements put in place once the initiative was operational. In the Irish example, the process of *ex ante* research, on-going review and evaluation were major elements of the home help initiative. Finally, in the Spanish technical innovation, Digital Radiography, a positive *ex ante* cost-benefit exercise provided justification for its implementation to go ahead.

Pace and scale of change

The case studies from Ireland, the Netherlands, Sweden and the UK all report that the public health system has been subject to widespread and rapid changes over recent years. Interestingly, no apparent negative effects were reported in Sweden although the other countries do note a range of negative outcomes from these factors. In particular, Ireland noted the phenomenon of 'innovation fatigue', which is also a recognised feature of some areas of the UK public sector. Indeed, innovation fatigue may have played a critical role in the eventual abandonment of the home help innovation as there was little general faith in the likelihood of long-term Government support for change. It was also notable that the Irish home help innovation had been partially driven by critical reviews of the Irish healthcare system and that the administrative structure was modified mid-way through the pilot phase when the Health Service Executive replaced the Health Board system.

In the UK, NHS Direct itself was an example of a major large-scale and radical new development, which was also introduced in a very rapid manner. The level of political support and the provision of resources may, in this case, have been strong factors which led to its successful implementation. Likewise, the Dutch case study noted that there were limited time resources available to prepare and implement the changes required for the new clinical pathways procedures and, although the scope of the innovation was limited to a single hospital, it represented a major change in that professionals were expected to accept a new "world model" or rationale in shifting from a functional orientation to a process orientation.

Even at the 'micro' level, the introduction of new shift practices within a single hospital were noted as having a possible negative impact on the acceptance of the innovations detailed by the Spanish case study, underlining the fact that the pace and scale of change are relative rather than absolute factors which may operate at a variety of levels.

Absence of a capacity for organisational learning

Again this appears to be a common feature across the case studies. At the system-wide level, the UK's Modernisation Agency represents one possible solution to creating greater awareness amongst and offering advice to health service organisations and bodies for improving their capacities for organisational learning. However, in the remainder of the case studies, problems with a lack of organisational learning were generally tackled at the institutional level.

Thus, NHS Direct sites operated strong feedback loops at the local level together with flexible local remits which allowed them to react to new and changing conditions. The ability to apply local modifications to the Clinical Assessment Software also improved the system's ability to react. In the diabetes education case study, training was offered to GPs in the diabetes awareness education.

In Spain, the lack of flexibility in the administrative sections of the hospital indicated a lack of a capacity for organisational learning, while it was noted that the hierarchical organisation of Swedish hospitals reduces the potential for dialogue between various actors and stakeholders, thereby hindering innovation. In the latter case, the key role of champions or entrepreneurs was felt to have been successful in overcoming this barrier and in gaining the acceptance of the innovation. Similar issues were encountered in the Netherlands with the diffusion and implementation of healthcare innovations being seen as particular problems. This was caused by a lack of process management systems and the slow reaction of service management in embracing change. The outcome was a general resistance to concepts such as "patient centred care" as they relate to the "real world", especially amongst 'grass roots' staff such as assistant nurses. The case study also indicated that there had been a lack of feedback on the policies implemented by the management team. Overall, the problems encountered were symptomatic of the absence of a professional management tradition and the lack of experience with regard to the management of change and the use of dialogue between actors.

Finally, one of the principal reasons underlying the failure of the Irish case study example was thought to be that it attempted to resolve issues programmatically and bureaucratically that could have been more easily resolved by attention to addressing the issues of "agency culture" prevalent in the health system.

Public (and end-user) resistance to change

The case studies diverged quite markedly with respect to this potential barrier, ranging from strongly supportive to resistant. In the Swedish case study, for example, public resistance was not an issue as the SABH met a perceived requirement from the public (i.e. children and their families) and was, in the event, well-received by its users. Indeed, when SABH was threatened with closure, there was a strong reaction in support from the users. Similarly, in the Dutch case study, although in general the public seem to "deny" the existence of mental health institutions, those with a closer involvement such as patients and family councils tend to be in favour of improvements and seek greater participation in the change process. The same situation was true for the UK NHS Direct case study wherein there was an apparently high overall level of public acceptance. While some population groups were less active in the take up of the service, this was due to factors other than a direct resistance to the scheme.

Conversely, the changes in practice enacted through the introduction of Main Ambulatory Surgery in the Spanish Hospital example provoked initial resistance from the patients. This had to be overcome through a demonstration of the potential and actual benefits of the new system. As the Digital Radiography technique had no direct impact on patients' experience with its use, it provoked no reaction.

The UK diabetes education study provided some interesting examples of patient resistance, and an unwillingness to become "empowered patients", or at least to remain as passive recipients of healthcare. This reaction was generally stimulated by factors such as the poor level of education and low economic status, together with age, which militated against the acceptance of novel, non-"traditional" approaches and promoted an inherent difficulty with initiating lifestyle changes. Such resistance was not a general reaction and, as in the case of the instances of low uptake of NHS Direct access, was due to a range of cultural, social, economic and educational diversity barriers.

No specific incidence of public resistance was detected in the Irish introduction of a new home help system although it was perceived as a potential issue: the elderly tend to prefer to

retain their independence. There was some general resistance from patients to the notion of 'change' with complaints about the fact that more resources appeared to be diverted to "paperwork" rather than to direct actions such as support for and contact with the elderly.

Absence of resources

With the exception of R&D funding, a lack of resources, either across the entire health sector or specifically for the support of or incentives for innovation, was noted as a strong barrier in all the case studies. As was stated in the Swedish case study, lack of financial resources can act as a driver of innovation as resource constraints may promote cost-saving innovations. This was nicely illustrated in the Irish case study when the removal of budgetary pressures contributed to the termination of the new home help initiative since there was no longer a need for a cost-saving solution! However, resource constraints also tend to restrict innovations which aim at quality improvements as these often entail higher costs. Thus in the Swedish SABH example, budgetary cutbacks formed a key factor in prompting resistance to the project amongst higher levels of the hospital management and in local government and delayed its implementation. In addition, the project was hampered by the limited resources available for supporting the development of the associated telemedicine requirements.

Other examples, such the UK diabetes education study noted that there was a need for the provision, or demonstration of incentives before innovations stood a chance of succeeding. Hence, in the Spanish case study, there was a requirement to undertake an *ex ante* cost benefit justification before permission was granted for the introduction of Digital Radiography. In the same case study, although the Main Ambulatory Surgery process had high introduction costs, it was found to generate savings in the longer term. Certainly, the fact that the introduction of NHS Direct was accompanied by a major input of resources can be viewed as a contributory factor towards its implementation.

Technical barriers

In two of the case studies, the progress of the innovations was dependent on the co-development of technical systems. Thus, the successful implementation of NHS Direct in the UK was highly reliant on the development of the Clinical Assessment Software and its clinical decision making protocols. The decision to use three separate systems in the pilot phase represented an interesting example of testing a number of options in parallel, prior to the eventual choice of a single system (which, in fact, did not form one of the three initially trialled systems).

In the Swedish example, although the innovation was successfully implemented, it did not fulfil its full potential due to a failure to develop the capability for the remote monitoring of patients, despite a number of technical projects devoted to this goal.

Drivers and facilitators

Problem-oriented drivers

These formed a common driver in the set of case studies, although the problems ranged from the generic system level down to the specific. In the UK the introduction of NHS Direct was prompted by a perceived imminent crisis in the provision of emergency care services and formed one of a set of potential solutions. In Ireland, the introduction of the new home help arrangements was prompted by a number of critical reviews of Irish healthcare; the

introduction of free health for those aged over 70 and associated demographic shifts and reductions in social capital. Again in the UK, specific concerns over the control of diabetes, particularly among the old, and socially and economically disadvantaged, coupled with the shift in diabetes care (and attendant resource burdens) from hospitals to GPs, prompted the search for a new solution in diabetes awareness raising and self-care in Salford.

At the institutional level, the introduction of a clinical pathways approach at the Dutch Vijverdal Hospital was prompted after it was perceived as a possible solution to a number of problems which had been identified in a self-assessment exercise. In contrast, the adoption of the Digital Radiography (DR) and Main Ambulatory Surgery (MAS) process by the Madrid Hospital were stimulated by a more general need to reduce pressures on time, financial and space resources. Hence, the former increased the speed of the provision of the service, whilst the latter reduced the pressure on bed space.

The Swedish SABH case study provided an example that did not seek to address a specific or identified problem as it the object of the new procedure was to minimise the trauma, for children and their families, of protracted stays in hospital: only after an independent (and, initially, unforeseen) evaluation were the cost benefits of the new process identified.

Non-problem oriented improvement

Many of the case studies examples were directed at a general wish to improve the standard of care (e.g. Ireland, Sweden) or in response to a general pressure for performance improvement (e.g. Netherlands, Spain). As noted above, the realised benefits stemming from the introduction of the innovations often only became evident after they had been in place for a while and it had been possible to evaluate their performance (underlining the issue of uncertain outcomes explored in Section 4.2.6). These unforeseen benefits were well catalogued in the Spanish case study and included:

- the reduction in raw material and processing costs, improved data communications and storage, together with a more reliable and faster service delivery resulting from the introduction of Digital Radiography, and
- in the case of Main Ambulatory Surgery, the reduction of post-operative care burden, decreased pressure on bed-space and the delivery of cost savings over traditional surgery

Political push

The case studies provide examples of the range of political drivers which may be employed to enact of drive through change and innovation. The introduction of NHS Direct in the UK received strong ministerial endorsement and received a major input from some of the highest officials in the public health sector, including the Government's Chief Medical Officer and Chief Nursing Officer. This support provided both a driver and a facilitator for change and new approaches to the delivery of emergency care services. In Ireland, the introduction of the new approach to home help provision took place in the context of a strong national impetus for health care change and national partnership programme underpinning wage agreements - the Workplace partnerships, which also facilitated the development of the innovation.

Political acceptance was also a critical factor in the development of the Swedish SABH procedures which impressed a number of local politicians as a new way to deliver paediatric

care. The fact that it also represented a patient-centred approach meant that it found 'political' support within the healthcare community as it embraced the new ideological view of healthcare delivery held by growing numbers of the healthcare professions. With regard to the role of new ideologies in driving innovation and change, a similar story applies to the UK (Salford) diabetes education programme, which sought to increase patient empowerment whilst simultaneously following clear top-down guidelines on diabetes care from the National Institute for Clinical Excellence and the National Service Framework on diabetes. The Salford case study also sat comfortably within the New Public Management ethos.

Lastly, in the Netherlands, the political pressure to provide greater autonomy through a process of de-institutionalisation offered a receptive environment for the introduction of the clinical pathways approach at Vijverdal. At a professional level, the view that clinical pathways are an "advanced" healthcare concept also facilitated the development of the process in conjunction with a general management-led implementation process for the integration of care services. Strong top-down pressures to seek solutions to budgetary pressures were also applied by the (financial) Regulator and local policy makers.

Growth of a culture of review

As already noted under Section 4.2.6, the need for appraisal, review and evaluation formed a major element in a number of the case studies. In at least two studies some form of *ex ante* assessment was employed into the possible implications and outcomes of the prospective innovations. In the Irish case study these took the form of baseline research studies and focus groups tasked with the identification of opportunities for flexible work practices. The introduction of NHS Direct in the UK was preceded by an extensive consultation exercise amongst stakeholders, although this was curtailed under the political pressure to accelerate implementation of the new system.

More common was the use of ongoing monitoring processes and evaluation. In the Netherlands, these involved stakeholder dialogues and feedback coupled with a strong quantitative evaluation of the treatment process. In the Swedish SABH example the work schedules were under constant scrutiny and the scheme was eventually accepted only as a consequence of the successful outcome of an independent evaluation. The Irish case study also embodied a strong consultative element and was subject to evaluation, whilst evaluation formed a major element of the NHS Direct delivery, both at the operational level through tight feedback loops, and at the broader scheme level: the pilot sites were subject to independent evaluations and also to an evaluation by the National Audit Office, the UK Government's financial "watchdog". However, one minor criticism of the NHS Direct evaluations was that the accelerated pace in rolling out the full service did not allow the lessons emerging from the evaluations to be fully disseminated and assimilated by the sites established in the subsequent phase.

Support mechanisms for innovation

As might be expected, the range of facilitative factors across the case studies was quite extensive and varied from those which were broad and systemic to those which were highly localised. The establishment of the Workplace Partnerships in Ireland was found to have played a facilitating role in the initiation of the new home help process through the encouragement of stakeholder-oriented partnerships at a general level. In a similar manner, in the Netherlands, the active promotion, by national organisations, of the clinical pathway approach in mental health paved the way for its introduction at Vijverdal. However, in the

UK, the role of the Modernisation Agency, which is intended to assist in the dissemination of innovations and best practice, was unclear. No direct effects were discernible either in the example of NHS Direct or in the Salford diabetes education programme.

In the same way that an absence of financial resources forms a barrier to innovation, the provision of funding naturally represents a major support mechanism and was noted by most of the case studies. Thus, in Ireland the home help innovation was put in place because of a funding opportunity which offered support for the pilot study, the Swedish SABH required significant start-up resources, the introduction of NHS Direct in the UK received large-scale and long-term financial support, and the Salford diabetes education programme was able to go ahead through a successful bid for long-term funding. The means of access to finance may also be important: in the Vijverdal case study the introduction of a variable budgeting structure allowed greater operational flexibility which assisted in the development of the clinical pathway approach.

At the local level the management of innovation is also an important factor. Hence, in Sweden, support from key officials and the presence of an active team greatly contributed to the eventual success of the SABH project, and the support from the Head of the Hospital in the Spanish case study was also a major contributory factor. Likewise, in the Netherlands a key success factor was the recognition that teamwork and the idea of "ownership" form important elements in facilitating organisational change.

Capacity for innovation

Irrespective of the organisational capacity for innovation, one of the most striking features common to most of the case studies was the key role played by the presence of highly skilled and committed "entrepreneurs" or champions, able to drive forward the innovation process. Such people were found to have played key roles both at the national and regional level in the case of NHS Direct, in the Salford specialist diabetes education team, the introduction of Digital Radiology in the Madrid Hospital and in the Swedish SABH process. In a broader context, the presence of a positive staff attitude towards new ways of operating was also found to be important in the Spanish case study.

The degree of success of such entrepreneurs and innovations was also found to be highly dependent on a number of organisational features. The NHS Direct local systems were themselves very open to innovative practices whilst the open remit of the NHS Direct sites encouraged problem solving and new, spin-off or complementary, initiatives and innovations; many instances were noted of new applications and linkages with complementary services. In the Dutch case study it was found that the linkage of care programmes with the administrative system promoted the management of the new organisation, offering improved ownership of patient care problems. There was also recognition of the importance of feedback mechanisms for monitoring the (intended and unintended) impacts of innovation at a variety of levels. This element of self assessment and self introspection was also noted in the Irish case study: the project was preceded by a thorough baseline research study and by the use of focus groups; it was introduced on a test basis as a pilot (as was NHS Direct in the UK); there was a strong element of evaluation (as in several other case studies); and the use of team meetings was seen as a positive learning experience. In Sweden, the SABH process was found to heavily rely on developing both a teamwork approach and in having staff able to work independently. There was also an extensive pre-project planning phase. Lastly, it was noted that in the Salford diabetes education project, a high degree of organisational learning had been exhibited by the relevant Primary Care Trusts.

While the above indicates that mechanisms such as appraisal, dialogue and evaluation are all key components for organisational learning, a willingness to experiment and try new approaches was also seen to be a useful attribute towards the success of the innovations studied.

Competitive drivers

Few instances of the role of competition in promoting and facilitating innovation were identified. Although the use of performance targets and of pseudo-markets is relatively widespread in the public health sector, no direct link could be made between competition and the studied innovations. In the NHS Direct case study, it was postulated that there may have been some competitive effects between the different regional sites but no evidence to substantiate this was found. In the Netherlands it was noted that the control of regional healthcare budgets by a Regulator induces an inter-organisational competition for resources, this was not found to have any positive effects on innovation. Indeed, during the initial stages of the development of the clinical pathway approach at Vijverdal, cooperation between the various stakeholders was hindered by fighting over the available resources.

Technological factors

The availability of new technology clearly offers an opportunity for new ways of doing things and can act as a strong facilitator for innovation. Thus, the introduction of the Digital Radiology process as studied by the Spanish case study was entirely due to the development of an alternative to the previously used Analogue Radiology. What was interesting, however, was the fact that the introduction of DR in turn contributed to a series of spin-off operational and organisational changes: for example, doctors were able to consult with colleagues using electronic, emailed digital images and data storage became easier and less space intensive.

While DR was the sole example of a technological innovation, technology also played a contributory role in a number of the other case studies. The development of Clinical Assessment Software was an essential element in the development of NHS Direct and although the service was centred on a very well established technology (the telephone), the potential of the internet was soon recognised and exploited through the development of NHS Direct On-line. Touch-screen technology was also used for the NHS Direct booths, sited in pharmacists, railway stations and other public areas. Although a fully dedicated technology for the remote monitoring of patients was not developed, without related developments in ICT (3G phones, for example), the Swedish SABH innovation would not have been possible to the same extent.

Conclusions

Overview of the case studies

The case studies presented in this report offer a diversity of public health sector innovations in terms of the type of innovation, the scale of the innovation, the context and environment in which it took place, the relationships impacted by the innovation and the level of involvement between the public and the application of the innovation. Using the types or elements of innovation characterised in Section 1.2.1, it is possible to offer a summary overview of the innovations encountered in the case studies. This is presented in Table 3.

Table 3. Overview of the case studies

Case study	Type(s) of innovation (primary)	'Associated' innovations	Context/ environment	Relationship impacted by innovation	Public involvement
1. Ireland	System interaction Organisational	Delivery	Regional (pilot)	Between service provider stakeholders	Indirect (care recipient)
2. Netherlands	Delivery	Conceptual System interaction Organisational	Institutional (single hospital)	Between service providers and patients	Direct (patient)
3. Spain: a. DR b. MAS	a. Technological b. Delivery	a. System interaction b. Conceptual, Organisational	Institutional (single hospital)	a. Between service providers b. Between service providers and patients	a. None (passive recipient) b. Direct (patient)
4. Sweden	Delivery	System interaction Organisational Technological	Single hospital and patients' homes	Between service providers and patients	Direct (patients)
5. UK MMU	Delivery	Conceptual Organisational	Local (within PCT)	Between service providers and patients	Direct (patients/ beneficiaries)
6. UK Manchester	Conceptual Delivery	Organisational System interaction Technological	National (via regional pilots)	New relationship (Emergency services providers and public)	Direct (patients/ beneficiaries)

Although this overview presents a highly diverse picture and is based on a very small sample of the potential total population of innovations in the public health sector, it does suggest a number of broad conclusions that may be drawn on the nature of innovation in the public health sector. Additionally, the analysis of the case studies serves to highlight a number of important lessons concerning the factors which may contribute, at least in part, to the success of innovation in the sector. These conclusions and lessons are detailed in the following sections.

Nature of public health sector innovations

The findings from our, admittedly limited, set of case studies are:

1. Unsurprisingly, the innovation frequently involves interaction with the public, usually as it impacts or affects the delivery of services by part of the public health system. However, the impact of the innovation on the public need not be direct. Indeed, as was the case in the Spanish Digital Radiology, the public may not be aware of the innovation or even the effects of its introduction. The public would only be affected through the very indirect, second or third order, impact of the innovation on aspects such as cost saving, additional bed space, etc. At the other extreme, in both the UK

and Swedish examples in particular, the public would be fully aware of the innovation and would experience its impact at first hand.

2. Innovation in the public sector is complex. It typically involves multiple stakeholders (which implies that any intermediation processes required for the acceptance and negotiation of the innovation will be correspondingly complex) and encompasses a range of types of innovation – conceptual, organisational, delivery, system interaction and technological. In fact, in the majority of cases there was no one single innovation but rather a mixture or blending of two or more innovations, or at least, changes in stakeholder behaviour. In the same way, although the innovation may be implemented in a single institution or locale, it is likely to have impacts far beyond this immediate context on other stakeholders, resource providers, patients and other care recipients. Furthermore, such impacts may well extend beyond those initially planned or sought (and may be negative as well as positive, or even both but to different audiences or in different contexts).

3. Further to the above point, the implementation and development of an innovation in the public health sector frequently requires the adjustment of relationships and forms of behaviour. Such adjustments highlight the need for close and ongoing dialogue between stakeholder groups, who may be more diverse than initially envisaged. Resistance to such adjustment can form a major barrier to the successful adoption of an innovation. In this respect the key roles of professional groups, who paradoxically may be at the forefront of (accepted) practice whilst adhering to traditional beliefs and norms, are also important

4. The systemic nature of innovation, which is a feature in both the public sector and the private sector, leads to the promotion of or even requires further innovation. There is also evidence that the innovating organisation often shows a high capacity to absorb or utilise complementary and parallel innovations. Whether this is promoted by the process of innovation itself or is due to the characteristics of the successfully innovating organisation, which is likely to be more ‘open’ to new ideas and ways of operating, is not clear, although it was noted in the case studies that innovating organisations were open to experimentation and to trying new approaches.

Lessons learned

From the case studies, it has been possible to identify a number of factors, or shared characteristics, that, at least partially, may contribute to the initiation, development and implementation of innovations in the public health sector. It should be stressed that while all the evaluations studied were successful - only one at time of writing (the Irish case study) had not been implemented beyond the pilot stage – the pathway to implementation was not always smooth. Thus, the following lessons are not a recipe for successful innovation but only indicators of potential contributory factors. They may also be interpreted as a set of broad policy recommendations.

1. There was a marked tendency for innovating organisations or for key personnel to demonstrate an **openness to ideas** and a willingness to think ‘outside of the box’. This

was found to be equally important in the development of novel solutions to problems, or in the identification of solutions to previously unrecognised problems or issues. It was also an important factor in the acceptance of new ideas and new operational practices, both from the perspective of management and from the perspective of those expected to deliver or utilise the innovation.

2. In some cases it was clear that it was important to **seize opportunities** in order to implement change and to gain the acceptance of new ideas. Such opportunities could relate to the availability of resources, the need to respond to enforced change or new circumstances, and the timing of political or organisational events. The coalescence of two or more factors might also be seen as an opportunity, such as in the Irish home help innovation where the availability of funding and a new agreement on working practices assisted in the development of the new process.

3. The role of **"champions" or entrepreneurs** was clearly significant. The presence of individuals with sufficient vision and determination to push the innovation process was a characteristic shared by many of the case studies. However, such champions also had to have access to resources or influence (ideally both) in order for them to be able to effect change and to motivate others.

4. As noted above, champions were important, but also required support. Many of the innovations relied, at one level or another on positive attitudes towards **teamwork and independent thinking** in order to take forward the innovation concept through a process of development to fruition. In some cases, innovations required an entirely new approach, thus the supporting team also had to be fully committed to the idea and able to deliver it in what were often novel, rapidly changing circumstances.

5. The **engagement of stakeholders** and the need for extensive and ongoing **dialogue** were key factors in initiating and sustaining innovations. In many cases, a range of stakeholders had to be convinced of the utility of the proposed innovations and resistance (to change procedures, to provide resources, to engage in practices with a higher perceived risk, etc.) had to be overcome. Once innovations had been put in place, it was essential to ensure all stakeholders still shared the same vision, that expectations were being met and that the lessons learned were being disseminated quickly (see below).

6. Innovating organisations need a **high degree of reflexivity** – essential an ability to demonstrate organisational learning. In concrete terms this behaviour was evidenced through practices such as *ex ante* appraisal, assessment and ongoing monitoring processes and evaluation of the outcomes and impacts, often within very short timeframes. In some cases these processes were carried out directly by the 'project team' itself whilst in others they were a feature of the broader innovation environment. Reflection and appraisal could occur at all levels. Coupled with such reflexivity, a high degree of responsiveness – an ability to react quickly to the outcomes of the review process – is also important: there is little point in monitoring if it does not prompt reaction.

7. Linked to the above point it seems, from some of the case study evidence, that the **demonstration of the utility** of implemented innovations is an important factor in terms of developing further support either for the innovation itself or for the implementing team or organisation. In cases where the innovation was problem-oriented, this is less critical as the success becomes self evident. However, as shown by the Spanish and Swedish case studies, the unforeseen benefits of the innovation may provide a convincing argument for the innovation which carry greater weight with some influential audiences (i.e. economic savings) than the initially foreseen benefits (i.e. improved quality of care). Such benefits are not necessarily restricted to economic outcomes but, as in the NHS Direct case study, may be linked to political outcomes (i.e. the Government was seen to be acting on a problem, and with positive outcomes). The fact that unlooked for outcomes may emerge is a consequence of the complexity of innovation described in the previous section and also underlines the need to identify and address any negative effects arising from the innovation.

8. Again linked to the previous two points is the need to **generate recognition and support** for innovation, both for the innovating organisation itself but also more widely across the public health system. This was the remit of the UK's Modernisation Agency which provided advice on how to undertake innovation and also encouraged the dissemination of best practice across the National Health Service. A number of the case studies mention the need to provide incentives for innovation, particularly in terms of persuading various stakeholders to adopt new practices.

9. The **retention of momentum** is another important factor. Of particular relevance is the need for organisations and systems to exhibit flexibility and work actively on the identification of further opportunities which may assist their particular innovations or which may benefit from it. To some extent, these features are linked to a culture of organisational learning and exploit the complex nature of innovation. An example is provided by several of the NHS Direct regional sites which quickly identified further innovations which could be brought in alongside the framework of the public helpline, such as chronic disease monitoring, telemetric applications, etc.

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