



Innovations *Briefing*

Spreading and sustaining good ideas in health care

What are the main factors that improve the chances of successful adoption of innovations? This briefing, drawn from a systematic review of innovation in health care, presents **a compact series of case studies** in this area designed to reveal important lessons about how to manage innovation and change more successfully.

A shorter briefing paper presenting key messages of the review is also available (see page 17).





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Making sense of innovation



A culture of innovation?

How do good ideas in health care service and delivery come about? How do they travel and spread? Different innovations are adopted by and spread to others, at different rates. Why, though, do some good ideas fare much better than others in organisations? Some are readily taken up, others are never adopted at all while still others are rapidly abandoned even when they have powerful backing and support. What can research evidence tell us about what makes for the relative success of one good idea over another? How can we make sense of this evidence in order to better understand how the potential costs and benefits of an innovation can be more readily recognised? How can we ensure that lessons for policy and practice from different types of innovation are drawn together and more widely shared?

These are among the questions which the Report on which this paper is based has addressed through an extensive review of the literature in the UK and internationally (see page 17 for details). A summary of key findings from the Report is also available.

Mapping the terrain

In order to make sense of the various factors involved, and to highlight those factors that tend to promote successful innovations in health, some sort of framework is required that can not only help us to navigate our way through the literature but also

enable us to assess the findings of evidence in this area and relate this to the world of policy and practice.

Figure 1 brings together diagrammatically the main findings of the Report, to propose a framework for the spread and sustainability of innovation in health service delivery and organisation. In this figure there are four main components:

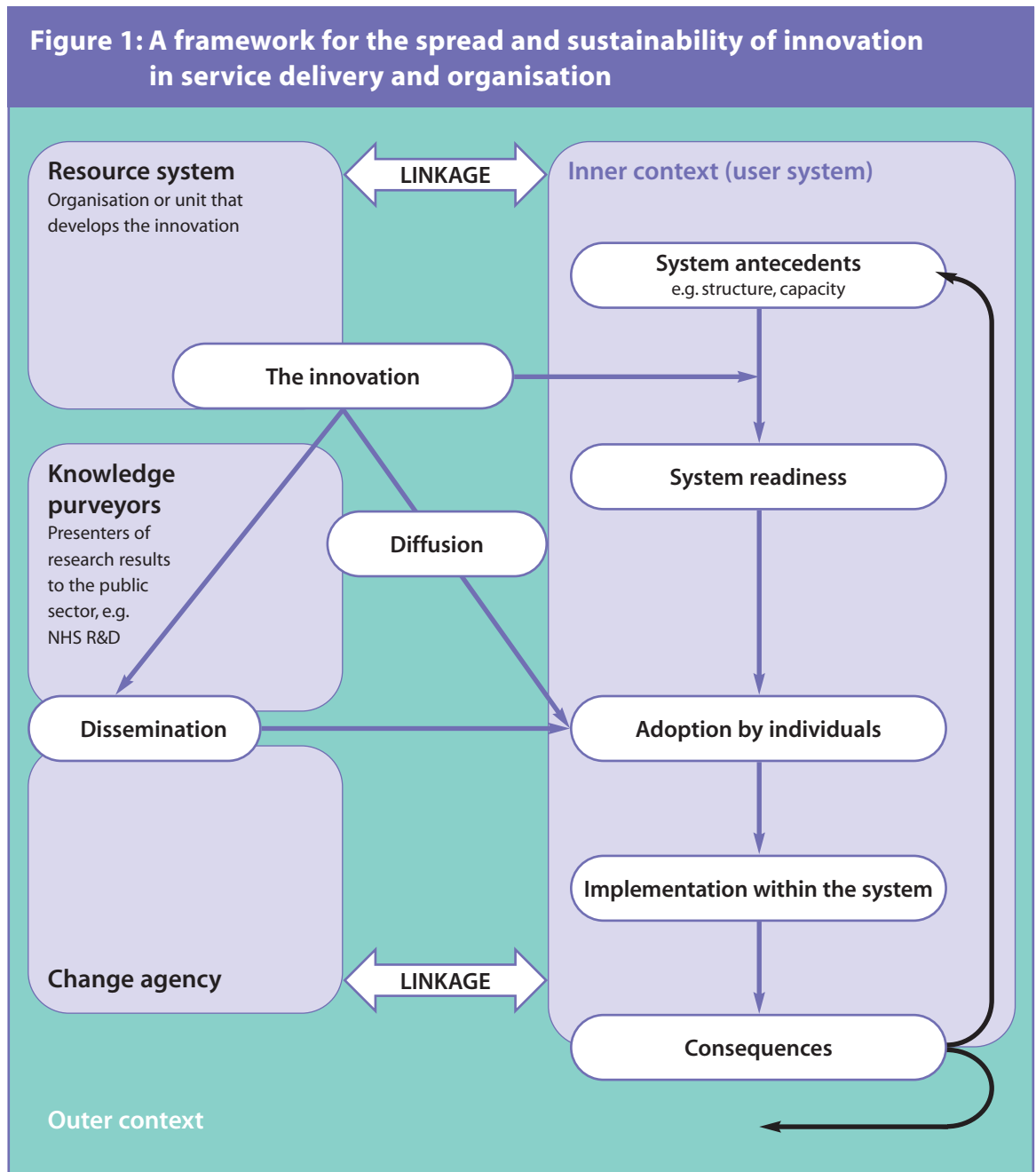
- outer context
- inner context
- the innovation
- linkages.

The components and their constituent parts exist not in isolation but in dynamic relation to the system as a whole. In what follows we will consider each component in turn and how it and its various parts relate to the whole, before going on in later sections to see how the model can be applied in practice. (For a fuller discussion of theoretical issues relating to the model and its evidence base, please consult the main report.)

Two points are worth stressing here about how to interpret and use the model.

1. Relating cause and effect. Arrows between components do not describe simple causal relationships but iterative ones. In other words, it is equally important to look at the ways in which all the elements interact with one another, and over time, as it is to focus on one or two elements and one-way directions of communication and influence. While the model should not be treated as a 'shopping list' it can point to some 'signs and symptoms' likely to be associated with energy for innovation.

2. Predicting what will happen. Not all the elements of the system will behave in predictable ways; to that extent no model of this type can claim to have full predictive value. That said, as discussed in 'Drawing key lessons together' below, researchers, policy makers, managers and practitioners probably stand to gain much by using this model as a basis for more detailed investigations aiming to understand the strength, direction and continuity of the energy for an innovation.



Inner and outer contexts

‘Outer context’ encompasses the economic, political, legal and social contexts in which any organisation operates.

‘Inner context’ refers to the medium within the organisation through which any innovation must pass in order for it to spread and be sustained; it also determines the rate and direction of adoption. Inner contexts vary enormously between organisations

and they impact on implementation and sustainability directly (e.g. via the organisation’s structures and goals) and indirectly (e.g. via an influence on participants and the innovation itself).

The inner context can be divided into a sequence of five parts or stages that make up a feedback loop, as follows.

System antecedents include:

- *structure*: e.g. size/maturity, formalisation, differentiation, decentralisation, slack resources

- *capacity to absorb new knowledge*: e.g. pre-existing knowledge/skills base, ability to find, interpret, re-codify and integrate new knowledge, enabling knowledge sharing via internal and external networks
- *receptive context for change*: e.g. leadership and vision, good managerial relations, risk-taking climate, clear goals and priorities, high quality capture of data.

System readiness for an innovation is dependent on:

- level of tension for change
- fit with system and its goals
- balance between supporters and opponents
- assessment of implications ('soft periphery' elements including staff changes)
- dedicated time/resources
- monitoring and feedback.

Adoption of the innovation by individuals depends on three ingredients:

- the *adopter*: their motivation, values and goals, social networks, skills and preferred ways of learning
- the adoption *decision*, including the extent to which this is optional, collective and addresses levels of commitment and compliance
- the adoption *process*, including how awareness is raised, knowledge created, people persuaded and the innovation implemented and confirmed.

Innovations are more likely to be **implemented** and **sustained** through:

- involving Human Resources and staff groupings
- enabling decision making autonomy
- internal and external collaboration
- 're-invention' and development of the innovation.

Consequences of innovations may be intended and/or unanticipated, more or less desirable and may have a knock-on effect in other parts of the system. For instance, technological innovations in pathology services may impact on system antecedents, working practices, staff levels/skills and on patient care (i.e. inner context), as well as on relations with external contractors and suppliers, public health strategies, and so on (i.e. outer context).

The innovation

Any innovation can be seen as having two sets of attributes that are more or less likely to help or hinder its rate of adoption and level of sustainability:

- **inherent**: what are its relative advantages? compatibility with existing systems and practices?

level of complexity – is this low (easier to adopt) or high (harder to adopt)? can it be trialled and observed? can it be 're-invented' to meet specific needs and re-applied in different contexts?

- **operational**: how relevant, feasible and/or useful is it to the task? how complex will it be to implement? how divisible it is? for instance, can it be broken down into more manageable parts and adopted on an incremental basis? can the knowledge required for the innovation's use be codified and separated from one context so as to be transferred to a different context?

The ways in which an innovation is communicated and influences individual and organisational behaviour can be seen as a continuum with at the one end **diffusion** (informal, unplanned) and at the other **dissemination** (formal, planned).

Less formal channels of communication exploit social networks, peer opinion and shared backgrounds (homophily). More formal channels may include marketing strategies and use of expert opinion. Key individuals likely to be involved here are:

- **opinions leaders** – best described as those perceived as having particular influence on the beliefs and actions of their colleagues
- **champions and advocates** – who dedicate themselves to supporting, marketing, and 'driving through' an innovation
- **boundary spanners** – who fulfil an important boundary role between different organisations
- **change agents** – who develop a need for change, diagnose problems, can translate intent into action and keep the momentum of innovation going at critical points.

Linkages between components

There is some empirical evidence (as well as robust theoretical arguments) for building strong links between different parts of the system depicted in Figure 1. Specific success factors include the following.

Linkage at development stage

If the innovation is formally developed (e.g. in a research centre), it is more likely to be widely and successfully adopted if the developers or their agents are linked with potential users *at the development stage* in order to capture and incorporate the user perspective. Such linkage should aim not merely for 'specification' but for a shared and organic (developing, adaptive) understanding of the

meaning and value of the innovation-in-use, and should also work towards shared language for describing the innovation and its impact.

Role of the change agency

If a formal change agency is involved with the dissemination and implementation of an innovation, the nature and quality of any linkage between it and the intended adopter organisations will influence the likelihood of adoption and the success of implementation. In particular, human relations should be positive and supportive; the two systems should share a common language, meanings and value systems; there should be sharing of tools and resources in both directions; the change agency should enable and facilitate external networking and collaboration between organisations; and there should be joint evaluation of the consequences of innovations (strong indirect and limited direct evidence).

This is particularly important in relation to innovations with a major technical element (e.g. new computer hardware/software), in which the innovation should routinely be disseminated as an augmented product with tools and resources, technical help, and so on.

External change agents

Change agents employed by external agencies will be more effective if they are (a) selected for their shared background and credibility with the potential users of the innovation; (b) trained and supported to develop strong interpersonal relationships with potential users and to explore and empathise with the user's perspective; (c) encouraged to communicate the user's needs and perspective to the developers of the innovation; and (d) able to empower the user to make independent evaluative decisions about the innovation.

For further discussion of the elements underpinning innovation see also the Briefing Paper which summarises the Report's key findings (see 'Further information' on page 17).

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Innovation close up



What follows are three case studies of particular 'good ideas' based on the findings of the research and its proposed model of understanding innovation (Figure 1). Cases have been chosen to illustrate a diverse range of innovations both past and present across a wide spectrum of health service delivery and innovation. They can be read in any order, depending on need and interest.

The studies are of:

- 1. Integrated care pathways**
- 2. GP fundholding**
- 3. Telemedicine**

Cases selected illustrate a range of key variables that need to be taken into consideration when understanding and supporting energy for innovation, including:

- strength of evidence for the innovation
- technology dependence
- source of innovation (central or peripheral)
- setting (primary or secondary care)
- sector (public or private)
- context (UK or international)
- timing (historical or contemporary example)
- main unit of implementation (individual, team or organisation).

(See main report for how these variables were identified.)

A number of these variables are illustrated in the cases. Note that the case studies do not seek to evaluate the innovations themselves.

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Case 1 Integrated care pathways 'a steady success story'



What are they?

Integrated Care Pathways (ICPs, also known as anticipated recovery paths, case profiles, critical care paths, case maps, patient pathways, care tracks or care protocols) are pre-defined plans of patient care relating to a specific diagnosis or intervention, with the aim of making the management more structured, consistent and efficient. An ICP typically incorporates:

- standards and guidelines developed either as part of the pathway itself or (more usually) externally
- recommendations for particular investigations, drugs or therapies
- checklists (with named roles assigned to particular tasks) and time frames.

ICPs are intended to be used by staff across all professional and administrative groups to record information about care, investigation, treatment and outcome. Thus, important elements of care are less likely to be missed and information less likely to be mislaid.

Rationale

ICPs originated in the USA in response to escalating costs of health care. In the UK the explicit rationale for ICPs, although connected with cost per case, has always had a strong emphasis on improving quality and effectiveness. The ability of ICPs to combine process, practice and audit makes them potentially invaluable as tools to assist clinicians and administrators, as well as commissioners and

providers, to meet both quality and business objectives through cost-effective, integrated care. ICPs do not take the politics out of change management. They do, however, make explicit the difficult question of how to work effectively across professional boundaries to implement an innovation and how to reconcile (or at least, reach a compromise between) different value systems (for example, evidence-based practice vs. cost efficiency).

How are they implemented?

ICPs can be useful clinically (and especially when things are suspected of 'going wrong') to gain a quick overview of the patient's history and the process of care, review progress and identify where any problems began to occur. An ICP is generally developed collaboratively in a hospital trust (or occasionally, across the hospital-primary care interface) by doctors, nurses, other health professionals, administrators, technical staff, and sometimes service users.

Evidence indicates that ICPs probably work best for patients when care and treatment are likely to follow a defined path, for example, elective surgery in the acute setting, and less well when treatment is likely to be a highly individualised or varied. However, ICPs can be created which allow for deviation from the pathway to suit the individual patient or a change in situation. For patients with multiple pathologies, needs and/or uncertain diagnosis, ICPs can still in theory be useful as tools or prompts that map broad processes and goals rather than outlining the detail of treatment.

More sophisticated ICPs can serve as maps or detailed series of actions (algorithms) to integrate and coordinate the input of different professionals and agencies to the care of service users with multiple and complex needs, for example, children with special needs or mental health users with dual diagnosis. Little evaluative work has been published on complex inter-agency ICPs.

How have they fared?

ICPs arose peripherally and spread informally via the professional networks of clinician enthusiasts. Fundamentally, ICPs were a good idea whose relative advantage was generally apparent and uncontested. They aligned well with professional and administrative values, and also chimed with prevailing political rhetoric about reducing variation

in performance and improving efficiency and throughput. No new technology was required, and the ICPs generally fitted well with existing organisational routines. Because they were readily triable and their impact observable, benefits were soon reaped and concerns about patients receiving 'rationed' rather than 'rationalised' care were seen to be rarely substantiated. Assimilation into hospitals was thus relatively unproblematic, helped by the fact that the innovation was resource neutral to set up and probably resource saving overall.

The research did not find any data on the types of organisational structure, or the prevailing cultures or climates that have supported the successful introduction of ICPs, but anecdotal evidence suggests that hospitals with a strong culture of interprofessional teamworking have the best track record.

ICPs are an example of an innovation that has shown steady – but not overwhelming – success. One important observation is that ICPs have not reached niche saturation – that is, while there are many excellent examples of such pathways there are many more examples where they could be in use but are not. Furthermore, many poor-quality ICPs are in circulation, and trusts may 're-invent the wheel' because they are unaware of existing models that could be adapted. All this highlights the relative absence of interprofessional collaboration on ICPs, and suggests that were such collaborations to be developed and strengthened, further spread and greater sustainability might be achieved.



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Case 2 GP fundholding 'a clash'



What was it?

This is a retrospective case study of an innovation during the period 1991–1998: GP fundholding. This proved highly problematic but it nevertheless provides important lessons about innovations on several fronts. It ‘came and went’ remarkably quickly; it was steeped in controversy from conception to demise; it had strong political overtones; and it aroused (and continues to arouse) strong emotions in stakeholders.

The 1991 NHS reforms established an ‘internal market’ and divided health services – controversially – into ‘providers’ of health care and ‘purchasers’ of health care. Purchasers, who included GP fundholders and family health services authorities (FHSAs) (which subsequently evolved into health authorities and thence to primary care trusts) ‘bought’ health care services for their patients from the providers who were the hospitals, GPs, pharmacists, dentists, opticians, community nurses and so on.

The central idea of fundholding was that, although patients could not be given unlimited money to purchase their own health care, GPs could act as informed purchasers while keeping an eye on priorities. In this way patients and their advocates could be involved in shaping local services. GP practices who opted to become fundholders were allocated money on the basis of their historical expenditure, and in the first waves of fundholding, some regions ensured that the budgets were

generous so as to ‘pump-prime’ the new system. The fundholding budget paid for practice staff, certain hospital referrals, drug costs, community nursing services and management costs.

Fundholding GPs were both purchasers (of secondary care) and providers (of general practice care). Their provider role was not of course new, but it was very new – and again, highly controversial – for some GPs to be given budgets to purchase non-emergency health care services for their patients. The other purchasers were the FHSAs who purchased non-emergency secondary care for patients whose GPs were not fundholders and emergency health care for everybody. FHSAs also purchased all primary health care. This involved contracting with GPs, dentists, pharmacists and opticians to provide, between them, the full range of primary care services.

Rationale

The two stated aims of introducing fundholding in the UK (which historically came somewhat earlier than the more clinically-oriented drives for evidence-based medicine and clinical governance) were to promote better value for money and to improve consumer choice. Fundholders were free to choose the type, volume, and location of care to be purchased, although they were obliged to indicate in their purchasing plans how they would address national policies such as the goals in the key policy documents of the day, such as the *Health of the Nation* White Paper and the Patient’s Charter. They were monitored by FHSAs and regional health authorities (RHAs), whose main focus was on the financial management of the fund rather than on the actual purchasing decisions made.

It has been argued that the GP fundholding scheme was an afterthought in 1989, when the whole system of the internal market was being developed, and that only subsequently did it come to the forefront of the NHS reforms. In 1991 there were 720 GPs in 306 practices involved in fundholding. In this initial phase, GP fundholding was limited to larger practices with over 11,000 patients, and their budgets averaged £1.3 million per practice. The minimum number of patients for a fundholding practice was later reduced first to 7000 and then to 5000. By 1994, 6 per cent of the total NHS budget, equivalent to £1.8 billion, was being spent by fundholders. Importantly, substantial variation

existed in the proportion of the local population covered by fundholders: for example, 80 per cent of the population was covered in Derbyshire and Bury, Lancashire, but only 4 per cent in Camden and Islington, London.

How was it implemented?

In 1994, government ministers began to introduce a range of schemes to extend fundholding and encourage its assimilation by what might be called 'late adopting' and 'laggard' practices. Individual or groups of practices with a registered population of over 5000 could opt to hold a budget to pay for specific hospital care, drugs, staffing in the practice, and community services – so-called standard fundholding. Practices with more than 3000 could hold a budget for community services and outpatient care only (so-called community fundholding). Practices could also opt for total purchasing, in which practices could buy any type of NHS care. Any type of fundholding practice could pool management resources with others to form a multifund. By April 1997, half of the population of England was covered by some system of GP fundholding. However, the change of government from Conservative to Labour in 1997 led to abandonment of the internal market and (as part of that) a rapid dismantling of the fundholding system, which ceased in 1998.

How did it fare?

One argument goes that the spread of GP fundholding was driven mainly by GP initiative (GPs seeking, for honourable reasons, to improve services for their patients) and that – for the innovators in particular – it required courage, hard work and professional unpopularity with non-fundholding colleagues (who, implicitly, were less courageous and less hardworking, so had little genuine grounds for protest). Then when hospital consultants belatedly recognised the extent to which fundholding had moved power to family doctors they added their voice to the opposition of other GPs.

Another argument goes that fundholding played to the interests of well-resourced, well-organised suburban group practices with stable, compliant populations and relatively simple health needs (as opposed to mixed health and social needs). Practices in inner cities, so this argument went, were often single-handed GPs working from poor premises and

servicing highly mobile populations with complex health and social needs. Their slow assimilation of fundholding was not because of lack of courage or laziness but because the innovation did not fit the needs of the practices or the populations they served (for whom broad-based community development, social capital and so on were presented as the way forward). Thus, both sides involved in this 'clash' laid claim to the moral high ground.

One of the most hotly contested issues was the amount of money that changed hands, and how it was spent. By the end of the second year of fundholding, fundholders had underspent by £31.7 million while non-fundholders had overspent by £9.8 million. By 1995 the total underspend on fundholding budgets was estimated to be £120 million. Whether fundholders used their savings efficiently and appropriately is a controversy that is unlikely ever to be resolved. While many of these initiatives had clear benefits to patients, the issue is whether they represented better value for money than what HAs might otherwise have used the funds for, and whether it was appropriate for public funds to be spent on improving practice premises owned by the GPs themselves, who would benefit personally when the premises were sold.

Because of its contested nature, GP fundholding is an excellent example of an innovation whose relative advantage was perceived very differently by different players. It proved incompatible with certain value systems; and some potential adopters had a good existing knowledge and skill base (for example, in accounting) while others did not. Its knock-on effects were difficult to isolate or measure. Moreover, it is a good example of a centrally driven innovation that rose and fell with the prevailing political climate. Early adopters – who were probably in tune with the change agents (and often shared their political persuasion) – were publicly groomed, supported and rewarded, but the strategy for dealing with later adopters and non-adopters was less well thought out. The (alleged) wave-on-wave reduction in per capita fundholding budgets, for example, was widely publicised and interpreted as 'moving the goalposts', and the scheme began to lose credibility. Fundholding was an unusual innovation in that both adopters and non-adopters justified their arguments in moral terms – and both claimed the high ground. The lack of a formal pilot phase or rigorous evaluation programme means that this historical example will always remain controversial.

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Case 3 Telemedicine 'a maverick initiative'



What is it?

Telemedicine is the use of telecommunications technology to provide medical information and services. Use of telecommunications technology to facilitate health care delivery has evolved over nearly four decades, beginning with pioneer programmes such as telepsychiatry consultations and teleradiology in the late 1950s. Telemedicine, with varying degrees of success, has subsequently been applied to a wide array of medical specialty areas including radiology, pathology, psychiatry, cardiology, neurology and neurosurgery.

Telemedicine is conventionally considered on three levels, dependent on the technology and infrastructure available:

1. Use of telephone and fax technology for patient consultation and referrals
2. File transfers for interactive still images, store and forward images, or video conferencing over low band-width connections
3. Full-motion video images that permit a full range of interactive diagnostic services.

Telemedicine provides useful lessons about innovations. Almost uniquely for a complex health service innovation it has been formally addressed from the classical 'diffusion of innovations' perspective in a number of empirical studies and theoretical papers; it tends to be introduced by individual enthusiasts rather than organisation-wide; and it raises particular issues around sustainability.

Rationale

Benefits claimed for patients include:

- rapid access to secondary and tertiary health care while maintaining continuity of care from GP or local specialist
- proximity to home and support of family, friends and primary care team
- avoiding unnecessary, costly and traumatic transfers between hospitals
- improved access of services to remote, underserved and possibly low-income areas.

Benefits claimed for practitioners include the following:

- access of non-specialists to real-time consultations with experts
- richer communication and learning between participants (notably GP and specialist) which occurs without taking time away from practice
- building of professional networks and collegial support
- shifting the power base of decision making, allowing (for example) GPs to directly manage the care of patients with support from specialists, rather than vice versa.

How is it implemented?

Early applications often focused on remote populations scattered across mountainous areas, islands, open plains, and Arctic regions where medical specialists and sometimes primary care practitioners were not easily reached. In the early years telecommunications costs were initially high and technologies awkward to use and technically unreliable. Few projects appeared to be guided by a business plan or an appreciation of the project features and results necessary for a sustainable programme.

More recently, telemedicine has undergone a resurgence driven by several factors. These include economic pressures to contain the rapid growth of health care expenditures; the increasing emphasis on fair resource allocation; the sociopolitical desire for decentralised and locally adjusted access to health care; rising demand and expectation for 'quality' health care (and hence for an expert opinion); and the availability of major research funding streams for e-health (including national and global information infrastructures and e-health collaborative activities). Other influencing factors are significant advances in medical and information

technology, for example, computer tomography and magnetic resonance imaging (MRI), and a steady fall in price/performance ratio of these innovations.

Enthusiasts say that the goal of telemedicine is to 'marry medicine with technology', capitalising on the advantages of technology to produce a robust system that 'reaches the parts other services do not reach', thereby delivering an enhanced service at an affordable price. Sceptics argue that face-to-face contact is fundamental to health care and that telemedicine can never be as good as the 'real thing', and that expansion of services is often driven more by doctors who are technology enthusiasts than by those genuinely seeking to expand services and redress inequalities.

Like all technology-based innovations, telemedicine should be thought of not as a piece of hardware but as a complex process between human actors that is supported by technology. It is also increasingly triable, and clinicians who would not describe themselves as 'technical' are beginning to try it out. The evidence base for the overall effectiveness and cost-effectiveness of telemedicine remains contested but well worked-up examples of particular initiatives that have shown clear benefit are now available in the literature.

Evidence suggests that if telemedicine were to 'take off' and reach anything approaching niche saturation, health care would look very different, since it threatens much of the structures and cultures underpinning and surrounding medical specialisation.

How has it fared?

Despite telemedicine's recent surge in growth, obstacles to its widespread use persist. For example, although many groups are working to develop hardware and software standards, it remains frustrating and difficult to put together systems in which the components operate predictably and smoothly together, work in different settings without extensive adaptation, and accommodate replacement components. Technical systems often remain poorly adapted to the human infrastructure of health care, that is, the work environment, needs, and preferences of clinicians, patients, and other decision-makers. Moreover, sustainable telemedicine programmes require attention to organisational business objectives and strategic plans that is not always evident in current applications.

Telemedicine can be seen as 'a maverick initiative' because the typical scenario is of a small team of enthusiasts setting up the service. But a number of factors combine to conspire against its spread and sustainability. Furthermore, the innovator who introduces a telemedicine project generally lacks the skills or interest to 'mainstream' the initiative within his or her organisation. The story so far of telemedicine at organisational level has generally been one of 'boom and bust' as champions and short-term funding streams come and go. However, several factors have recently come together to swing the risk-benefit equation more in telemedicine's favour – most notably the development of more user-friendly technology, the fall in its price/performance ratio, and the increasing recognition by IT companies of the need to involve health care clients in development and trialling of software and to provide improved customer support. Telemedicine is thus entering an interesting phase, and it is possible that its fortunes thus far (relatively poor spread and low sustainability) may soon be improved.



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Drawing key lessons together



The NHS is a large, complex organisation where all but the simplest of innovations and ideas will need to address a range of internal and external factors, including not least the inherent complexity, traditions and power dynamics of professions and other interest groups. All three innovations considered here raise important questions, challenges and dilemmas, for example, about the range and diversity of innovation, complex ownership issues, different needs and expectations of different 'client' groups, as well as national/local priorities, resource allocation and the pros and cons of perceived strong political backing.

Many of the issues raised extend beyond that of the particular innovation, and suggest factors-in-common. A greater awareness of these commonalities can help managers, change agents and others to design and implement strategies tailored to specific need and circumstances. Sharing and comparing experiences of innovation at all levels is also more likely to lead to greater cross-fertilisation of knowledge, less wastage of ideas, energy and resources, and to help foster an organisational culture that not only welcomes and accommodates innovation but actively encourages and rewards it.

In the tables following the three case studies are compared in relation to:

- characteristics of the innovation and the intended adopters (Table 1)
- aspects of communication and influence and features of the organisations (Table 2)
- the wider environment and the implementation

process (Table 3)

- the role (if any) of external agencies (Table 4).

Readers will be able to use the tables to compare these key characteristics and variables. As well as drawing lessons and ideas from the examples included here, they may wish to apply the framework of the model in other contexts, for example, in order to:

- identify the impact of structure and agency on the course of an innovation
- learn retrospectively or in real time about what has worked well or not so well in a particular innovation
- enhance their own methodologies and mechanisms for audit and review of innovation uptake.



Table 1: Innovation attributes and adoption in the three case studies

	Integrated care pathways	GP fundholding	Telemedicine
Key attributes of the innovation as perceived by intended user: (a) relative advantage (b) compatibility (c) complexity (d) trialability (e) observability (f) reinvention	(a) Relative advantage is potentially high (b) Compatible with many professional values (e.g. evidence based practice) and administrative ones (efficiency) (c) Complex to develop because of multi-disciplinary input, but relatively simple thereafter (d) Highly trialable (e) Highly observable (f) High potential for reinvention	(a) Relative advantage was contested (whose advantage, and at whose expense?) (b) Compatible with the values of some (innovative, business-driven) but highly incompatible with traditional ethos of separating clinical work from 'administration' (c) Complex (d) Not easily trialable (e) Observable but many confounding influences (f) Low potential for reinvention	(a) Relative advantage high in certain contexts e.g. geographically remote areas (b) Compatible with values of technology's early adopters but not with more traditional values of 'face to face' medicine (c/d) Initially complex and not easily trialable, telemedicine is increasingly simple to use and trialable on a limited basis (e) Impact highly observable (f) Moderate potential for reinvention
Key operational attributes (a) task relevance (b) task usefulness (c) feasibility (d) implementation complexity (e) divisibility (f) nature of knowledge needed	(a-c) A good ICP will have high task relevance and usefulness, and will be feasible (d) May be very complex to implement initially (e) Possibly divisible (f) Knowledge generally highly codifiable and therefore transferable	(a-b) Relevance and usefulness was contested ('improving services' vs 'paperwork') (c) Variable feasibility (d) Very high implementation complexity (e) Not initially divisible (but see text) (f) Knowledge mostly highly codifiable and transferable	(a-c) Task relevance, usefulness and feasibility vary depending on context, hence has 'taken off' in some fields more than others (d) Implementation complexity high but getting lower (e) Increasingly divisible (f) Knowledge moderately codifiable
Who are the adopters and what are their characteristics and needs?	Broad range of clinicians and administrators with widely differing needs and expectations	Adopters – generally well-resourced, suburban group practices Non-adopters – inner city, single-handed	Adopters – technology enthusiasts plus remote practitioners. (These two groups have very different needs.)
What is the meaning of the innovation to intended adopters?	For most, a way of improving and systematising patient care For a minority, 'paperwork', 'interference'	Either 'opportunity to improve services' or 'shifting administration' or 'two-tier system'	Generally, seen as a means of improving efficiency and choice. Some see it as a superfluous gadget.
What is the nature of the adoption decision?	Usually collective, though may be authoritative	Collective within each practice (contingent on practice size)	Usually optional but contingent on service being available
What are the concerns of adopters at: (a) pre-adoption stage (b) early use stage (c) experienced user stage and to what extent are they met?	(a) Will the pathway be evidence based? Will it make work (or save work) for me? Will powerful interest groups impose their views? (b) How can I overcome logistical barriers? (c) How can we improve this ICP? Can we share with others?	(a) What is fundholding? What are the costs and benefits, especially personal workload and income? Do we have the capacity and skills? (b) How can we operationalise the purchasing process? (c) Can we set up a multi-fund?	(a) Can I make the technology work? Will the consultation lose richness at a distance? Will patients accept it? What will it cost? (b) Technology and logistical issues (c) Can we extend the service to other specialities? Business spin-offs?

Table 2: Communication and influence, and the inner context, in the three case studies			
	Integrated care pathways	GP fundholding	Telemedicine
What is the nature of the networks through which influence about the innovation is likely to spread?	Innovations generally arise spontaneously at local level and spread via Informal, horizontal networks of professionals	Fundholding spread partly by geographical proximity and also across groups with similar backgrounds/interests, e.g. via National Association of Fundholders	Two main mechanisms for spread: professional networks (technical special interest groups) and (once established) local spread via interpersonal influence
Who are the main agents of social influence and what are they doing?	Expert opinion leaders – mainly academics and quality improvement experts Range of local champions	Peer opinion leaders (practices with high social status)	Potentially, expert and peer opinion leaders, though sometimes no such individuals can be identified
What are the key structural features of the organisation in terms of: Size/maturity? Complexity/differentiation? Decentralisation? Slack resources?	ICPs have generally been adopted in hospital trusts with established 'multidisciplinary team' structures No data on slack resources	Large size was a prerequisite for fundholding status Slack resources were provided to early waves of fundholders but not to later waves, leading to resentment	In the past, successful telemedicine projects have tended to occur in very large trusts involving groups of hospitals As capital cost of setting up telemedicine falls, size and slack may become less critical
What is the organisation's absorptive capacity for this type of knowledge, in terms of: Skill mix? Knowledge base? Transferable know-how? Ability to evaluate the innovation?	In general, a reasonably well run district general hospital would have the capacity to assimilate and adapt an ICP (i.e. the level of specialist knowledge, skills and know-how is relatively low)	Fundholding required a high level of business skills and also high clinical knowledge for purchasing. (Note: when Primary Care Trusts were introduced, fundholders' knowledge base proved highly transferable.)	Until recently, telemedicine required special hardware and internal technical knowledge) More recently telemedicine consultations have become possible using largely 'ordinary' desktop equipment
What is the organisation's receptive context for this type of change, in terms of: Leadership and vision? Values and goals? Risk-taking climate? Internal and external networks?	No formal data but anecdotal reports suggest that it was the innovative, risk-taking hospitals who first tired out ICPs, and that these initiatives were led by pioneer clinicians who were widely networked externally	No formal data Fundholding practices tended to have an entrepreneurial and very businesslike culture Some non-fundholders had a good receptive context but were unmotivated to adopt fundholding	Data from several US case studies (see Report) suggests a strong link between change-oriented culture and climate and successful telemedicine initiatives
What is the organisation's readiness for this specific innovation, in terms of: Organisational fit? Assessment of implications? Dedicated time/resources? Broad based support?	In general, ICPs have been embraced enthusiastically and given appropriate support from top management (perhaps because relative advantage is clear to most players and cost is fairly low)	Readiness was formally developed and assessed during a shadow year Dedicated resources were supplied A minority of practices lacked consensus on readiness and many were unanimously opposed	Several detailed case studies in the literature suggest that organisations that were enthusiastic but lacked specific readiness were able to adopt, but not sustain, telemedicine projects

Table 3: The outer context, and the implementation process, in the three case studies

	Integrated care pathways	GP fundholding	Telemedicine
What is the nature and influence of the socio-political climate?	Positive climate towards multidisciplinary working, reducing variation in care, reducing waiting times, and increasing accountability, effectiveness and efficiency	Strongly in favour at inception; changed to strongly opposed with 1997 change of government	Until recently, not especially favourable but e-health now seen as a research priority and a means of improving accessibility and reducing inequalities
Are there any external incentives and mandates?	No	There were many incentives at the outset ('first wave' fundholders) but these controversially diminished in successive waves	Not currently
What are the prevailing norms from other comparable ('opinion leader') organisations?	ICPs increasingly seen as a 'good idea' but pressure from peer organisations not especially strong	Two opposing and powerful 'bandwagons' which became increasingly politicised – National Association of Fundholders, and various formal and informal networks who were ideologically opposed to fundholding	Inter-organisational norms not especially strong, perhaps because telemedicine still generally arises in a somewhat ad hoc way and is driven through by individual champions rather than via organisation-wide policy
What are the features of the implementation process in terms of: (a) Human resources? (b) Involvement of key staff? (c) Project management?	In general, implementation of ICPs: (a) requires no new roles or staffing (b) requires and presupposes widespread staff involvement (c) is inherently a project management initiative	Fundholding practices were generally characterised by: (a) good human resources and HR practices (c) good project management skills. However (b) a minority of practice staff felt the innovation was imposed on them	This innovation can (and often is) implemented by individuals or groups of interested clinicians and only subsequently extended throughout the organisation Some never go beyond the 'maverick' stage
What measures are in place to capture and respond to the consequences of the innovation (e.g. audit and feedback)?	In general the collection and analysis of audit data (or at least the facility to do so) are built into the ICP	Tight financial accounting and audit was a requirement of the system Alleged knock-on consequences for patients of non-fundholders were not systematically measured	Variable approaches to audit and feedback Some projects at least lack a systematic approach to this, but others collect good data and use it systematically to improve services
What measures enable organisations to develop, adapt and reinvent the innovation (e.g. inter-organisational networks and collaboratives)?	A weakness of ICP spread is that there are few well-developed networks, so development occurs slowly and in an ad hoc way	Strong collaborative support and knowledge sharing occurred: (a) in geographical localities (b) through national associations	No formal collaboratives Interested professionals can join a variety of networks (e.g. academic mailing lists and conferences)

Table 4: The role of external agencies in the three case studies

	Integrated care pathways	GP fundholding	Telemedicine
Are the developers linked with potential users of the innovation at the development stage? Do they share value systems, language and meanings?	Not usually developed centrally	The extent to which potential users of fundholding were involved in its design is contested	Often good linkage between IT companies and telemedicine innovators, allowing modification of systems as they are developed
What is the capacity and role of the external change agency (if any) to help organisations with operational aspects of assimilation?	No central change agency officially devoted to this innovation but National Electronic Library for Health is building a resource bank of downloadable ICPs	High quality, flexible and responsive 'outreach' support was provided by local family health services authorities for practices in early stages of fundholding	No central change agency
Who are the main external change agents and do they show: (a) a shared background and practices? (b) positive relationships and client centeredness (c) shared language and meaning	No external change agents; spread is by the professional networks of internal champions	External agents tended to have a formal political role (a-c) High level of shared background, positive relationships and shared meaning with early adopters of fundholding but none of these with non-adopters	No external change agents; spread is by the professional networks and interest groups of individual adopters
Does the dissemination programme follow social marketing principles, in terms of: (a) audience segmentation? (b) assessment of target group needs and perspective? (c) appropriate message and marketing channels? (d) good programme management? (e) process evaluation?	No formal dissemination programme	The 'marketing' of fundholding was highly controversial and widely believed to have been inappropriately politicised	No formal dissemination programme
What is the nature and quality of any linkage relationship between the change agency and the intended adopter organisations?	N/A	Main change agencies were local family health services authorities who enjoyed strong pre-existing links and high degree of shared language and meaning with fundholders	N/A

Further information

The research findings provided in this paper are based on a longer report:

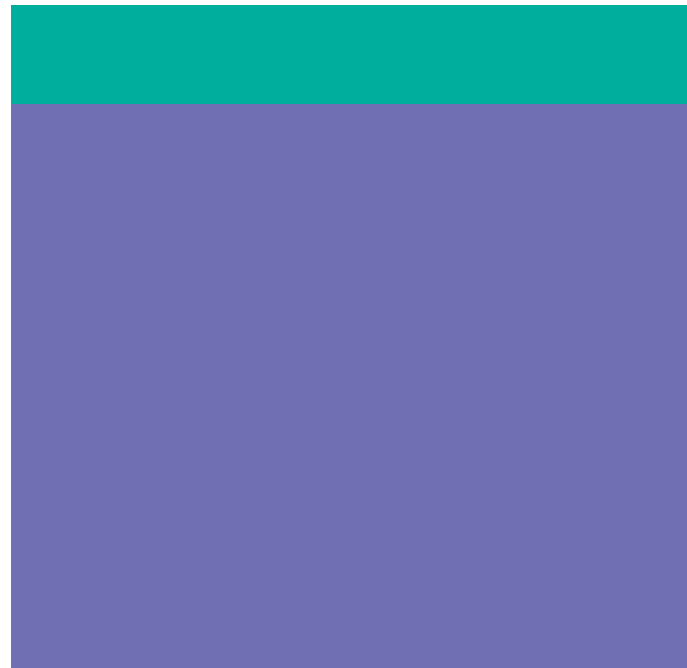
Greenhalgh, T., Robert, G., Bate, P., Kyriakidou, O. Macfarlane, F. and Peacock, R. (2004) *How to Spread Good Ideas: A systematic review of the literature on diffusion, dissemination and sustainability of innovations in health service delivery and organisation*. Report for the NHS SDO R&D Programme. April 2004.

The full report, this briefing paper and another briefing paper summarising key messages and findings of the report, together with details of current SDO research in the field, can be downloaded at:

www.sdo.lshtm.ac.uk/changemanagement.htm

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