

Chapter 1

Introduction

Key points

1. This systematic review of the diffusion, spread and sustainability of innovations in health service delivery and organisation was commissioned in late 2002 by the UK Department of Health as part of a programme of research aimed at supplying the evidence base for the modernisation of the NHS. It should be interpreted with this policy context in mind.
2. We have defined innovation in service delivery and organisation as a novel set of behaviours, routines and ways of working, which are directed at improving health outcomes, administrative efficiency, cost-effectiveness or the user experience, and which are implemented by means of planned and coordinated action.
3. The mechanisms by which innovations spread include both diffusion (a passive phenomenon of adoption by individuals and organisations) and dissemination (the

active attempt to influence the rate and success of adoption).

4. Sustainability of organisational innovations can be thought of as the point at which new ways of working become the norm and the underlying systems and ways of working become transformed in support. Whereas the diffusion and adoption of innovations has been widely researched at both an individual and an organisational level, their implementation and sustainability are relatively under-researched areas.

5. The study, which entailed exploring and organising a complex and diverse body of literature, raised important questions about the methodology of systematic review, which are discussed in Chapter 2.

1.1 What is diffusion of innovations theory?

'Diffusion of innovations' is a term that means different things to different groups of scholars. Classical diffusion of innovations research, as set out by Rogers,³ is a body of knowledge built around empirical work that demonstrated a consistent *pattern* of adoption of new ideas over time by people in a social system. Its central tenet is that the adoption of new ideas by a population follows a predictable pattern. There is a slow initial (lag) phase, followed by an acceleration (take-off) in the number of people adopting in each time period, then a corresponding deceleration, and finally a tail as the last few individuals who are going to adopt finally do so (Fig. 1.1).

Underpinning diffusion theory is a simple law about the nature of growth in a closed system, observable across the biological sciences from cell division to epidemiology: one cell divides into two (or one person infects two others), two becomes four and so on, doubling with each unit of time until a point of saturation is approached when each new convert has fewer potential converts to influence, after which the process slows and tails off. Mathematically, the point of diminishing growth (or spread) is the point where an exponential function becomes a logistic function.*

*Enthusiasts for the mathematical small print are encouraged to see Henrich's¹⁰⁰ excellent article, based on complex mathematical modelling, on why the S-shaped adoption curve supports the hypothesis that adoption occurs via a mimetic (copying) phenomenon between

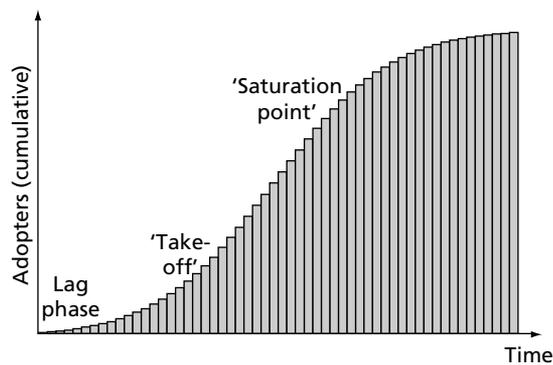


Fig. 1.1 The S-curve – cumulative distribution of adopters over time.

For an excellent account of these mathematics from an epidemiological perspective, see Bailey's classic text.¹⁰¹

This pattern only occurs if the population is fixed and the influence of the innovation (e.g. the value attached to it) stays constant over time. If there is rapid population turnover, infusion of new people, loss of former members or a change in the market (or other) value of the innovation, the curve will cease to be S-shaped.¹⁰²

Within a particular population, there may be several distinct subpopulations with different adopter characteristics. If these subpopulations were separated, each would have its respective S-shaped diffusion curve with a longer or shorter lag phase and a greater or lesser proportion that ultimately adopts; the combined population will also show an S-shaped diffusion curve, which is the sum of the curves of the subpopulations. Different innovations introduced into different populations produce a cumulative adoption curve of the same basic shape as shown in Fig. 1.1, but with different slopes (rates of adoption) and intercepts (proportion of people adopting), as shown in Fig. 1.2. The explanatory challenge for diffusion of innovations theory is to account for the differ-

individuals rather than via the rational weighing up of costs and benefits by potential adopters. Henrich points out that a small proportion of adoption curves are in fact r-shaped rather than S-shaped, and discusses the underlying mechanisms for these oddities.

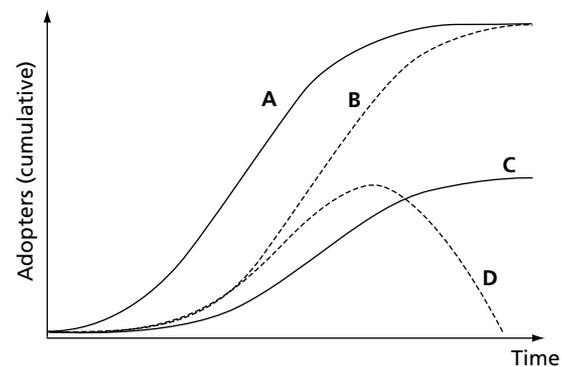


Fig. 1.2 S-curves for different innovations and populations. A = rapid and complete adoption by a population; B = similar pattern following a longer lag phase; C = slower adoption and incomplete coverage; D = adoption followed by discontinuance.

ences in slope and intercept of curves A, B and C – and (crucially) account for curve D (discontinuance), which is probably the commonest diffusion curve of all.

Whilst the simple law of natural growth is sufficient to *describe* the shape of the adoption curve, it does not tell us why some people adopt an innovation early while others do so much later – or why they never adopt it at all. Furthermore, classical diffusion of innovations theory takes little or no account of the complex process of adoption (or, strictly, assimilation) of innovations at the organisational level.

As Chapter 3 (page 48) describes, a wide range of conceptual and theoretical models for the adoption, diffusion, dissemination, implementation and sustainability of innovations have been proposed and empirically tested in fields as diverse as sociology, anthropology, psychology, communication studies, economics, development studies, epidemiology, organisation and management, and complexity science. Whilst we knew from the outset that the research literature crossed many disciplinary boundaries, we did not initially anticipate the wide diversity of theoretical perspectives and research designs adopted by different groups of scientists, nor that one of our central tasks would be to develop a preliminary taxonomy of the contribution, strengths and limitations of these

Chapter 1

different research traditions. The disciplinary origins of these traditions are summarised in Table 1.1 (pages 23–24). It should be noted that the construction of Table 1.1 was a major intellectual effort that we only completed towards the end of this systematic review. As Chapter 2 (page 32) describes, we did not – and, we believe, *could* not – construct this table before the main synthesis work began. We have, however, included it in this chapter to orient readers towards the framework set out in Chapters 4–9.

1.2 Why did the UK Department of Health want to research the diffusion of innovations?

The UK NHS was set up in 1948 by the post-war labour government under the staunchly socialist Minister of Health Aneurin Bevan, who promised a Welfare State that would provide health and social care for every citizen ‘from the cradle to the grave’.⁴⁹⁹ The NHS was an explicit product of the ideology and social structure of UK in the 1950s – an era in which the solidarity of the war effort had focused communities on mutual support rather than individual gain; rationing of food and fuel was still in place; and a large proportion of medical problems comprised acute conditions requiring a straightforward package of initial treatment followed by convalescence. At that time, both science and technology were advancing at a steady but manageable pace; no-frills care was an accepted goal of politicians and public alike; the expectations of service users were relatively modest; and changes in technologies and service needs were barely discernible year on year.

This socio-political context produced the built environment of the NHS (hospitals designed for lengthy inpatient stays, general practices designed as one-man businesses for reactive care), its administrative structure (centralised, hierarchical and standardised), its values (unlimited care according to need, free at the point of delivery) and its conventions and ways of working (e.g. separate hierarchies, management structures and information systems for different professional groups).

Like any large public-sector bureaucracy, today’s NHS constantly struggles against the past that shaped it. Its leaders have, arguably, been somewhat trigger-happy in the past in introducing well-intentioned changes intended to ‘modernise’ outdated structures and systems. In the early 2000s, the Department of Health recognised that the modernisation of the NHS should move beyond centrally driven, standardised and unpopular restructuring initiatives and begin to celebrate and support decentralised, creative change at a local level. It also recognised, perhaps in response to the growing ideology of consumerism and accountability in health care, that the service must be designed much more closely around the needs and experience of the user. The detailed vision and strategy to achieve this was set out in the 2001 white paper, the *NHS Plan*.¹ A key element of the strategy was the establishment of a new statutory body, the NHS Modernisation Agency, charged with driving through a range of organisational and cultural reforms. In the words of its chief executive:

The NHS has embarked upon a decade of improvement. Over the next ten years the delivery of care will be transformed as the *NHS Plan* is implemented. Care will be designed around the needs of patients and their carers. Diagnosis and treatment that previously took weeks or months will be completed in days or even hours. The NHS Modernisation Agency has been created to help local staff across the service make these radical and sustainable changes.

David Fillingham; Modernisation Agency website (www.modernnhs.nhs.uk/ ; accessed 31 December 2003)

Between 2001 and 2005, the Modernisation Agency worked with more than 3000 local clinical teams as part of 30 national programmes established in accordance with the *NHS Plan* in priority development areas such as primary care, cancer, heart disease and emergency care. These modernisation initiatives had mixed fortunes and few independent, in-depth evaluations have been published, but many positive outcomes were described.^{103–106} One early finding from these

Table 1.1 Research traditions that have produced findings relevant to the diffusion of innovations in health service organisations, showing disciplinary roots, scope and key concepts.

<i>Research tradition</i>	<i>Academic discipline</i>	<i>Definition and scope</i>	<i>'Diffusion of innovations' conceptualised as</i>
Rural sociology	Sociology	The study of rural society and the relationships between its members, especially the influence of social structures and norms on behaviours and practices	Influence of social norms and values on adoption decisions. Networks of social influence.
Medical sociology	Sociology	As above for medical society	As above. Specifically, the norms, relationships and shared values that drive clinician behaviour (e.g. adoption of guidelines).
Communication studies	Psychology	The study of human communication, including both interpersonal and mass media	Structure and operation of communication channels and networks. Interpersonal influence (e.g. impact of 'experts' vs 'peers' on decision-making).
Marketing	Interdisciplinary (psychology and economics)	The study of the production, distribution and consumption of goods and services	Affordability, profitability, discretionary income, market penetration, media advertising, supply and demand.
Development studies	Interdisciplinary (anthropology, sociology, economics, political science, information and communications technology)	The study of the adoption, adaptation and use of technology, especially in a development context	Barriers to the uptake of more advanced technologies (e.g. labour-saving machinery, computers).
Health promotion	Interdisciplinary (epidemiology, social psychology, marketing)	The study of strategies and practices aimed at improving the health and well-being of populations (draws on, and overlaps with, communication studies)	'Reach' and 'uptake' of positive lifestyle choices in populations targeted by health promotion campaigns
Evidence-based medicine	Clinical epidemiology	The study of the spread of best [research] evidence on managing diseases and symptoms	Filling a 'knowledge gap' or 'behaviour gap' in targeted clinicians

Continued

Chapter 1

Table 1.1 continued: Research traditions that have produced findings relevant to the diffusion of innovations in health service organisations, showing disciplinary roots, scope and key concepts.

<i>Research tradition</i>	<i>Academic discipline</i>	<i>Definition and scope</i>	<i>'Diffusion of innovations' conceptualised as</i>
Structural determinants of organisational innovativeness	Organisation and management	The study of how the structure of an organisation influences its function in relation to uptake of new ideas and practices	Organisational attributes influencing 'innovativeness' – e.g. size, slack resources, hierarchical vs decentralised lines of management
Studies of organisational process, context and culture	Interdisciplinary (organisation and management, sociology, anthropology)	The study of the development and impact of culture (meaning systems, language, traditions, accepted ways of doing things) in organisations and professional groups	Changes in culture, values and identities
Interorganisational studies (networks and influence)	Interdisciplinary (organisation and management, sociology)	The study of interorganisational norms, fashions and influence	Interorganisational fads and fashions, spread through social networks
Knowledge utilisation	Interdisciplinary (organisation and management, information and communications technology, sociology)	The study of how individuals and teams acquire, construct, synthesise, share and apply knowledge	Transfer of knowledge – both explicit (formal and codified as in a guideline) and tacit (informal and embodied as in 'knowing the ropes')
Narrative studies	Interdisciplinary (literature, sociology, anthropology)	The study of the stories (in this context, those told in and about organisations). Use of storytelling as a tool for dissemination and change in organisations	The telling, re-telling and interpretation of stories. Innovators as characters (heroes, underdogs) in a story of change. Innovation as social drama
Complexity studies	Interdisciplinary (ecology, social psychology, systems analysis)	The study of how individuals, groups and organisations emerge, evolve and adapt to their environment	Creativity, emergence and adaptation

projects was that the intensive injection of energy, expertise and resources generally produced short-term improvements in the targeted service, but two critical questions remain unanswered:

(1) To what extent would the changes achieved through a Modernisation Agency-funded initiative be sustained after the official end of the project?

(2) How could improvements achieved in one health service organisation be effectively and reliably disseminated to a wider group of comparable organisations, thus gaining maximum impact from the original efforts?

The Modernisation Agency interpreted its agenda – perhaps somewhat naively in retrospect – as identifying and defining best practices, extracting the features that were critical to the success of such practices, adapting them to new contexts, supporting their implementation and ensuring that the improvements were sustained. It explicitly sought to produce transferable tools and models that would be of direct use to staff involved in NHS modernisation.¹⁰⁷ It established its own Research Into Practice Team, which produced a number of internal reports about change in general and the spread and sustainability of innovation in particular.^{108–112} These reports were based largely on qualitative interviews with stakeholders regarding modernisation initiatives. They were produced impressively quickly and (hence, perhaps) had considerable face validity in policymaking circles, but they were essentially studies of the intuitive impressions of front-line staff and were not designed prospectively to test empirical hypotheses about the process of change.

Whether the Modernisation Agency (due to be disbanded in early 2005) had the ‘right’ approach or not, it drew considerable international interest as a model of change. Professor Don Berwick described the work of the Modernisation Agency as ‘to my knowledge, the most ambitious concerted systematic improvement effort ever undertaken, anywhere, by any organisation of comparable size’ (Don Berwick, personal communication, May 2003).

Our own team has previously questioned whether the approach of the Modernisation Agency, based largely on intensive short-term sup-

port for specific projects, was sufficient to achieve true transformation of the NHS, and whether the underlying – and largely taken for granted – theory of change underpinning its efforts was suited to the scale, pace and type of ‘second-order’ shift required for NHS modernisation.^{113,114} Recognising that its capacity to conduct systematic research into such questions was limited, the Modernisation Agency approached the Department of Health Service Delivery and Organisation Programme with the initial idea for the systematic review reported in this book.

Whilst we kept in mind the policy context of our work and maintained a focus on the Modernisation Agency as our ultimate ‘client’, we did not make any conscious political concessions to this (or any other) body. Indeed, we took some steps to ensure that our work was academically independent of the Modernisation Agency (e.g. after an initial interview to set the scope for this work, we did not invite its members to our steering group meetings), and we tried to remain distanced from the prevailing political ideologies espoused in its publications. Nevertheless, we are aware that no research study is ideologically neutral, and in accordance with standard practice in qualitative research, we have set out our own backgrounds and perspectives in Chapter 2 (page 34).

1.3 Scope of this research

The research study, including the write-up, was intended to last 9 months. Funding was provided for approximately one full-time academic post and a part-time administrator/librarian for this period. Within the constraints of our budget and timescale, we aimed to provide a comprehensive (but not encyclopaedic) summary of the literature that would describe, evaluate and summarise the relevant theoretical approaches and empirical research studies.

As explained in Section 1.2, we sought to provide information on the work of the Modernisation Agency and the *NHS Plan* in relation to the spread and sustainability of organisational innovations and to make clear recommendations for practice, policy and further research in the UK

Chapter 1

public sector. We were interested in identifying what might be termed ‘critical success factors’ for the spread and sustainability of innovations in an organisational setting, though we knew from the outset that many if not all such factors would be highly context-dependent.

A secondary objective was to contribute to the emerging scientific discourse on the methodology of systematic reviews of complex evidence (which, like this one, are often undertaken in a particular policy context and under resource and time constraints).^{12,40,115–120} As Table 1.1 illustrates, the wealth and breadth of relevant literature promised many important insights, but it also posed major practical problems for the systematic reviewer working on a tight budget and deadline. Our frustrations on a practical level reflected fundamental epistemological questions about the nature of knowledge and the implications for synthesising, summarising and prioritising complex, cross-disciplinary and disparate bodies of evidence. This aspect of the research is discussed further in Chapter 2 (page 32).

1.4 Definitions

It is important to bear in mind when reading this book that there is not, nor will there ever be, a consensus on terminology. Different individuals, influenced by different professional, disciplinary and sociocultural traditions, use the same words in different contexts. In our research, we found a wide range of implicit and explicit definitions of these concepts (‘service delivery’, ‘organisation’, ‘innovation’, ‘diffusion’, ‘spread’, ‘sustainability’), and a similar range of meanings for other critical terms such as ‘adoption’, ‘communication’, ‘technology’ and ‘implementation’.

We recognise that linguistic meaning is highly context-dependent, and do not seek to privilege the definitions that we ourselves have chosen. But for the purposes of preparing a systematic review, we felt obliged to attempt to make a firm demarcation between what would be included and what would be excluded in each of the key terms in our research question. It proved impossible to hold to these definitions, since in practice different research teams used words in particular contexts. We used

our judgement to interpret the work of different authors in the light of the definitions they used rather than strictly impose ‘inclusion criteria’ based on our own – arbitrary – definitions. Nevertheless, we set out the linguistic ‘benchmarks’ against which the relevance and validity of the empirical studies covered in this chapter were judged, and in Chapters 4–9 we highlight where the definitions used by other researchers differ from these.

Innovation in service delivery and organisation

Rogers’³ much-quoted definition of innovation is (page 11):

An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behaviour is concerned, whether or not an idea is objectively new as measured by the lapse of time since its first use or discovery.

This definition is helpful when considering individual behaviour (e.g. when a clinical guideline might be classified as an innovation by a doctor or nurse) but it is less useful at an organisational level (e.g. when the same clinical guideline might be classified as an *organisational* innovation on a ward or in a GP surgery). Using this example, it is clear that the guideline only becomes an organisational innovation if it precipitates some kind of planned change in the structures and systems in the organisation. People in the organisation need to do more than perceive the guideline as new; they must *do* something – adopt new roles, make different decisions, form new relationships, use new technology, develop new systems and so on. And this begs the question of how innovation differs from any other kind of organisational change.

Osborne reviewed the organisational studies literature and found over 20 different definitions of innovation, from which he extracted four core characteristics:

- (1) innovation represents newness;
- (2) it is not the same thing as invention (the latter is concerned with the discovery of new ideas or approaches whereas innovation is concerned with their application);

- (3) it is both a process and an outcome; and
 (4) it involves discontinuous change.¹²¹

Tushman and Anderson¹²² argue that discontinuity is the essential difference between innovation and incremental organisational development, while Van de Ven¹²³ defines organisational innovation as the development and implementation of new ideas by people who over time engage in transactions with others within an institutional order. From a sociological perspective, innovations are novel (at least to the adopting community), making communication a necessary condition for adoption.¹²⁴

The link between innovation and implementation is particularly crucial to the modernisation agenda in the UK NHS. For this reason, Damanpour's¹²⁵ and Euan's definition of organisational innovation is particularly pertinent:

Innovation is the implementation of an internally generated or a borrowed idea – whether pertaining to a product, device, system, process, policy, program or service – that was new to the organisation at the time of adoption. . . . Innovation is a practice, distinguished from invention by its readiness for mass consumption and from other practices by its novelty.

In their review of interorganisational transfer of innovation, Goes and Park⁶⁸ offer the following sector-specific definitions (page 674):

[A health care innovation is] a medical technology, structure, administrative system, or service that is relatively new to the overall industry and newly adopted by hospitals in a particular market area. . . . [Service innovations are] innovations that incorporate changes in the technology, design, or delivery of a particular service or bundle of services.

In a review based mainly on the manufacturing sector, Damanpour¹⁶ distinguished between 'product' and 'process' innovations – a distinction that is probably less clear (and less helpful) in the world of health service delivery where many innovations are a combination of product and process. Westphal *et al.*⁸¹ has pointed out that whereas the notion of a technological innovation is relatively straightforward, the definition of administrative

innovation is more ambiguous. Administrative innovations can potentially include many different routines that can be combined in different ways, and hence it is often more difficult to identify a discontinuous change. Ultimately, a degree of subjective judgement will usually be required.

Added to this already complex taxonomy is Osborne's¹²⁶ fourfold classification of social policy innovations, comprising developmental innovations (existing services to a particular user group are improved or enhanced), expansionary (existing services are offered to new user groups), evolutionary (new services are provided to existing users) and total (new services to new users). We have not used Osborne's taxonomy because the mainstream literature on health service innovations rarely draws on it, and we did not find it especially helpful in explaining the findings of the empirical studies presented in this book.

The essential criterion of newness for an innovation immediately excludes practices and programmes that are long established, even if they fulfil key quality criteria (such as effectiveness, efficiency, affordability and acceptability). It is a recurring protest in the NHS that 'innovations' imposed from outside are not necessarily better than existing practices and processes, and indeed that (usually by means of unintended consequences) they may represent a retrograde step.

Two additional concepts should therefore be considered here: 'best practice', defined by Zairi and Whymark¹²⁷ (page 160) as 'a task, function or behaviour which, when carried out, produces above average results'; and 'potentially better practices', defined by Horbar *et al.*⁸⁶ as practices that have been shown (or which are believed) to improve outcomes in one setting, and which can be selected, modified and applied in unique ways to fit a new situation, which takes account of the fact that 'best practice' in one setting is only *potentially* an improvement on existing practice when transferred elsewhere. Interestingly, in their study of potentially better practices, Horbar *et al.* made no attempt to verify whether the practices *actually* improved outcome – indeed, they comment that the critical impetus for quality improvement may be the process of pulling together to implement

Chapter 1

anything that improves *or is perceived to improve* outcome, not the practice itself.

Taking account of all the above, we constructed a new definition for the purposes of this review: An innovation in health service delivery and organisation is a set of behaviours, routines and ways of working, along with any associated administrative technologies and systems, which are

- (1) perceived as new by a proportion of key stakeholders;
- (2) linked to the provision or support of health care;
- (3) discontinuous with previous practice;
- (4) directed at improving health outcomes, administrative efficiency, cost-effectiveness, or user experience; and
- (5) implemented by means of planned and coordinated action by individuals, teams or organisations.

Such innovations may or may not be associated with a new health technology.

This definition is by no means perfect, since it presupposes a rationalist view of innovation, i.e. it implies that innovation is an event rather than a process and that the assimilation of innovations will be through planned and transformative rather than continuous and emergent change; hence, initiatives based on developmental and collaborative models would not be strictly included in this definition. The criterion 'discontinuous with previous practice' was not therefore applied in all cases, but we did use it to distinguish initiatives to spread *new* ways of working (included) from initiatives aimed at encouraging more widespread use of a practice that is generally seen as already 'mainstream' as an idea. To give a specific example, meta-analysis of 'Interventions that *increase use of* adult immunisation and cancer screening services' (emphasis added), as defined by Stone *et al.*,¹²⁸ is excluded under this criterion.

One final caveat in relation to organisational innovation is the very different meaning of the word 'organisation' in different contexts. The bulk of research into organisational innovation has been done in the commercial sector, and a high proportion of empirical studies centre on industrial manufacturing, software production and distribution, and marketing. In these contexts,

the 'organisation' is generally a firm with something to sell and shareholders to answer to. Indeed, von Hippel¹²⁹ defined innovation in terms of its potential ability to make firms more competitive, suggesting that 'innovative behaviour is a strategic activity by which organisations gain and lose competitive advantage'. In the public service sector, of course, 'organisation' is a different and fuzzier concept in terms of both structure and process,* and the literature on spreading innovation is sparse by comparison. In preparing this review, we rejected a lot of material from the commercial and manufacturing sectors – but we have also included substantial elements of this literature, and the health service practitioner must judge how relevant particular findings are to their own context.

Adoption of innovations

Rogers³ defines adoption (in relation to the individual; page 21) as 'the decision to make full use of the innovation as the best course of action available'. Damanpour and Gopalakrishnan,¹³⁰ writing about the adoption of innovations in organisations, define it as:

[A]n organisation's means to adapt to the environment, or to pre-empt a change in the environment, in order to increase or sustain its effectiveness or competitiveness. Managers may emphasise the rate or speed of adoption, or both, to close an actual or perceived performance gap.

Both these definitions imply that people and organisations choose rationally to adopt innovations because of some actual or perceived advantage. As we shall see, the adoption of advantageous innovations often fails to take place; likewise, adoption of disadvantageous innovations is sadly very common. We shall also see (in Chapter 5) that adoption

*Take, for example, UK general practice – is the unit of analysis in organisational innovation the practice itself, the practice plus its attached staff (e.g. district nurses), the Primary Care Organisation, the health district and so on?

(and non-adoption) is not always a rational process, nor is adoption a single decision.

In the organisational context, adoption is more usually referred to as assimilation, and this is discussed further in Section 5.3 (page 160).

Diffusion, dissemination and spread

These terms have similar meanings in common parlance, and are also used interchangeably by some researchers and policymakers. But it is generally agreed that there are subtle but important distinctions between them. We have accepted Rogers'³ own definition of diffusion (page 5): 'Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system.'

For Rogers, diffusion thus refers to the spread of abstract ideas and concepts, technical information, and actual practices within a social system, from a source to an adopter, typically via communication and influence. As with the chemical process from which the metaphor is taken, diffusion of ideas or practices is an essentially passive process whose key mechanism is imitation ('let it happen' rather than 'make it happen' – see Fig. 3.5, page 82).

Wejnert,⁴¹ a political scientist and author of one of the most comprehensive overviews of diffusion of innovation from a socio-political perspective, views the task of the diffusion researcher as (page 297): 'identifying the factors that influence the spread of innovations across groups, communities, societies and countries ... an area of inquiry referred to formally as diffusion'.

Dissemination, on the other hand, is a planned and active process intended to increase the rate and level of adoption above that which might have been achieved by diffusion alone ('make it happen' rather than 'let it happen' – see Fig. 3.5, page 82). Mowatt *et al.*,¹³¹ who undertook a systematic literature review of the diffusion and implementation of health technologies, developed a standard definition of dissemination (page 669), which we have used in this review: 'Dissemination is actively spreading a message to defined target groups.'

'Spread' – a term used extensively by the Modernisation Agency in its own reports and included

on the original brief for this review – is not used extensively or consistently by scientists in the research traditions we reviewed. Only 21 sources out of over 1000 screened (apart from Modernisation Agency publications) used the term in the title or abstract, compared with 140 for diffusion and 42 for dissemination. It generally refers to the transfer of ideas and practices between (inter) organisations or within (intra) a single organisation.⁴³ Adler, an organisational theorist, suggests that spread refers to the adoption of innovation by others, through whatever means (including passive diffusion and active dissemination). Berwick rejects 'spread' as a concept, preferring the term 're-invention', which is also used by Rogers.³ Indeed, he states (page 1971) that the 'word "spread" is a misnomer'¹³² (implicitly, because nothing spreads in its original form since complex innovations are always changed as they become embedded in new organisational structures and systems).

Because of the lack of consistency in the definition and use of the term by others, we have used the term 'spread' sparingly in our review, preferring terms with a more widely accepted meaning ('diffusion', 'dissemination' and 're-invention').

Sustainability

Sustainability presupposes implementation (i.e. an innovation cannot be sustained unless it has first been implemented). Mowatt *et al.*¹³¹ define implementation in relation to health technologies (page 669) as: 'dissemination plus action to actively encourage the adoption recommendations contained in a message'.

The term 'sustainability' is even less widely used in the diffusion of innovations literature. We found it in only two out of over 1000 sources screened for this review (perhaps because the notion of adoption, at least in individuals, implies some continuity of use). The NHS Modernisation Agency's¹³³ working definition of sustainability is 'when new ways of working and improved outcomes become the norm'. They go on to clarify:

Not only have the process and outcome changed, but the thinking and attitudes behind them are fundamentally altered and the

Chapter 1

systems surrounding them are transformed in support. In other words it has become an integrated or mainstream way of working rather than something ‘added on’. As a result, when you look at the process or outcome one year from now or longer, you can see that at a minimum it has not reverted to the old way or old level of performance. Further, it has been able to withstand challenge and variation; it has evolved alongside other changes in the context, and perhaps has actually continued to improve over time. . . . Sustainability means holding the gains and evolving as required, definitely not going back.

This definition is supported by the academic literature in the few places where the term is mentioned at all. Von Krogh and Roos¹³⁴ emphasise the property of ‘resisting erosion’ – i.e. a resilience against undermining forces that consolidates innovations and turns them into normal practice (the institutionalisation of change). Others have emphasised as the essence of sustainability the durability of the attributes that produced improvement,¹³⁵ and the notions of ‘routinisation’ (i.e. the innovation becomes an ongoing element in the organisation’s activities and loses its distinct identity).^{95,123,136}

There is a hint from some publications that the Modernisation Agency and certain writers see sustainability as an intrinsic feature of the innovation itself, whereas Rogers,³ who does not define sustainability and mentions it only in passing, implies (page 341) that sustainability is more a function of the receiving system than of the innovation itself, though as we discuss in Chapter 8 (page 157) this is not a view that organisational theorists necessarily share.

A further issue complicating the concept of sustainability is the notion that inherent to the construct is resistance to further growth and development! If an innovation is sustained indefinitely, the organisation must become resistant to further innovation in that area. In the words of Eveland⁵⁰:

If we aim our efforts at routinization, we are likely to damn ourselves with success. Organisations that carefully implement state-of-the-

art computer systems tend to have a great deal of difficulty taking advantage of changing technology; they have too many ‘sunk costs’ in the old systems. It is well to remember that every old, outdated, ossified tool or practice in any organisation was once an innovation that got ‘routinized’ all too well.

Eveland⁵⁰ goes on to discuss the tension between rolling out good ideas *to* organisations and developing the capacity for change and innovation *within* organisations:

To the extent that research creates new and better ways to manipulate individuals and organisations into adopting other people’s views of what is a ‘good thing’, it will contribute by contrast to a dissolution of social progress. I realize that this may be a difficult point to swallow for those who legitimately believe they have a ‘good thing’ other people really need – a group that includes most of the ‘true believers’ in technological and social innovation. On balance, however, we are all likely to be better off by encouraging the development of the capacity for effective and purposive internalized self-directed evolution and control than by relying on any ‘diffusion system’ to overcome the shortcomings of organisational and individual change processes.

Weick¹³⁷ introduced the concept ‘irreversible action’ to denote the gains made from an innovation but also allows further development – the gains may be held or continue to be extended. Weick also introduced the notion that sustainability is a characteristic of the social system that exists within an organisation – i.e. it is fundamentally a social phenomenon, incorporated in the binding commitments people make to each other in relation to (but extending beyond) the innovation itself. Hence, when the innovation achieves ‘sustainability’, the organisation has moved forward in terms of the social relationships that support both this *and other* innovations. Using this definition, sustainability has a very different – and more positive – meaning from routinisation (which for some organisational theorists has the negative overtone of entrenchment¹³⁸). Indeed,

there is some evidence that the successful assimilation and implementation of one innovation makes an organisation more rather than less receptive to the next one, because the innovation itself serves as a catalyst for developing organisational sense-making capacity.¹³⁹ However, relatively few empirical studies have used Weick's definition and most organisational research reviewed here takes a more conventional view of the term.

In summary, like the term 'spread', 'sustainability' is rarely used in the mainstream literature on diffusion of innovations, and furthermore, it is a contested theme in the contemporary discourse on innovation in organisations. For these reasons, we have tried to capture the ambiguity around the meaning of 'sustainability', and to apply the term in a flexible way that embraces the tension between routinisation of one innovation and receptivity to others.

1.5 Structure of this book

Chapter 2 sets out the methods we developed for searching, prioritising, analysing and synthesising the vast literature that was relevant to this review, and gives our search strategy and synthesis methods. Chapter 3 provides an overview of the many diverse research traditions, each with its own conceptual, theoretical, methodological and instrumental approach to the problem. We also briefly mention some other potentially relevant bodies of literature that were omitted because of resource limitations. Chapters 4–9 consider evidence from all the main traditions outlined in Chapter 3 (page 48). It is divided into six separate chapters, each of which focuses on one key question:

- (1) Innovations: What features (attributes) of innovations influence the rate and extent of adoption? (Chapter 4, page 83)
- (2) Adopters and adoption: What is the nature of the adoption process – and why do some people adopt innovations more readily than others? (Chapter 5, page 100)

(3) Diffusion and dissemination: What is the nature of the diffusion process, and in particular how does social influence promote the adoption of innovations? (Chapter 6, page 114)

(4) The inner context: What elements of the inner (organisational) context influence the adoption and assimilation of innovations in organisations? (Chapter 7, page 134)

(5) The outer context: What elements of the outer (environmental) context, including aspects of interorganisational communication, influence the adoption and assimilation of innovations in organisations? (Chapter 8, page 157)

(6) Implementation and institutionalisation: What are the features of effective strategies for implementing innovations in health service delivery and organisation and ensuring that they are sustained until they reach genuine obsolescence? (Chapter 9, page 175)

Chapter 10 (page 199) draws together the results of the empirical studies into a single model (which is not intended to be prescriptive) and describes four illustrative case studies of how the model can be used to explain (and to a limited extent predict) spread and sustainability of a particular innovation in a particular context. Chapter 11 (page 219) discusses the overall messages of the report and provides recommendations for practice, policy and future research; it considers both the content of this review (spread and sustainability of innovations) and the process of undertaking synthesis of complex evidence.

We have also included four appendices:

- (1) Appendix 1 (page 232) – data extraction form for primary studies;
- (2) Appendix 2 (page 234) – critical appraisal checklists for different research designs;
- (3) Appendix 3 (page 245) – descriptive statistics on the included sources, and
- (4) Appendix 4 (page 255) – tables of included studies.

Finally, we have included a glossary (page 293), which summarises the definitions of the key terms used in this review.