Why is Sweden rethinking its NHS style reforms?

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During the 1990s Sweden has embarked on a series of changes to health policy heavily influenced by the British NHS reforms. These have included the separation of purchasers and providers, an internal market regulated by contracts, competitive tendering, and the encouragement of the private sector. We discuss the origins and main features of the Swedish reforms, examine the subsequent developments which have led to a rethink, and consider what other countries can learn from this experience. To help answer these questions we interviewed senior politicians and policy makers in Stockholm County, as well as analysing official policy documents and carrying out empirical analysis of activity and cost data.

Summary points

- The 1990s reforms of the British NHS stimulated similar market-style changes in Sweden
- In the largest county, Stockholm, problems started to surface almost immediately, requiring a series of modifications
- By 1996 a rethink was evident; as a result, there was a swing towards cooperation and away from competition
- Financial factors behind the rethink included a loss of cost control and problems with productivity incentives
- Concerns about maintaining equity and trust within the system were also decisive in the rethink

This is the second of three articles reflecting on recent developments in healthcare policy in Sweden

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The run-up to the reforms

Why was reform considered necessary? One of the triggers was growing discontent among influential sections of the population, partly rooted in the effects of cost control during the 1980s.[1] Through deliberate policies the proportion of gross domestic product spent on health care in Sweden fell from 9.6% in 1983 to 8.8% in 1991—Sweden and Ireland were the only countries in the Organisation for Economic Cooperation and Development to achieve any reduction at all over this period.[2] A further decrease to 7.6% in 1993 was largely the result of shifting care of elderly people from counties to municipalities.

Although this stabilised the healthcare budget, there were negative effects. As relative priority in healthcare was given to elderly and chronically sick people, waiting lists for elective surgery and access to primary care worsened for younger people and some services seemed unresponsive to their demands.

There were also shifts in some attitudes, again mainly in the middle class. Although national surveys still showed broad support for universal programmes, feelings about means tested benefits restricted to a minority and public bureaucracy were increasingly negative.[3] Ideas about introducing market forces and competition into public services in general started to gain ground and the British NHS reforms came along as a possible solution to the dilemma. Great attention was therefore paid to the white paper *Working for Patients* when it was published[4] and to British experts.[5 6]

At the end of the 1980s, the governing Social Democrats saw market reforms as a way of making the system more responsive and efficient and thereby dealing with some of the expressed criticism. The Conservative-Liberal government, which came into power in 1991, embraced these ideas even more warmly.

The reforms

The main responsibility for funding and organising the Swedish healthcare system lies with the county councils, regional self governing bodies with elected politicians. The 26 counties organise the provision of services as they wish as long as the overall management is judged to be in line with national principles and guidelines.

Many councils introduced at least some aspects of market-style reforms such as purchaser-provider splits and performance related payment systems.[7] Only in Stockholm County, however, did the reforms go as far as a managed market system introducing competition between providers, and consequently this model has received considerable attention in the public debate throughout Sweden.[7 8] We analyse the experience of Stockholm in the discussion that follows. Table 1 illustrates the main developments.

Purchaser-provider split

In 1989 Stockholm County was decentralised into nine semiautonomous district health authorities, each with a local political board. By January 1992, these authorities—still directly managing primary care,

When Sweden introduced reforms in 1992, a market-friendly mood prevailed. These four confident politicians ran large advertisements in the two leading newspapers. In hindsight, the caption is ironic: "Remember them: here are the four faces behind an important decision to expose the country to competition"

geriatrics, and psychiatry—were transformed into purchasers with responsibility for medical care, public health, and health promotion for their population. A new weighted capitation formula was devised to allocate resources from the county council to the districts. The purchasers were required to establish contracts with providers in which the volume and quality of care were to be specified.

The one private and nine public hospitals in the county were assigned as providers. Only research and education resources were guaranteed; the rest of their income had to come from contracts for services to be negotiated with purchasers in competition with other providers.[9]

Performance related reimbursement

As a financial incentive designed to stimulate productivity, a performance related reimbursement system based on diagnostic related groups was introduced for hospitals. This started in 1992 with five surgical specialties and was extended incrementally to include more.[10] At the same time, providers were no longer allowed to obtain services and rent facilities free from other public services but had to buy these from other providers at cost price. This was done to encourage cost consciousness and so that private providers were not at a disadvantage.

Encouraging private providers

Several measures aimed to stimulate competition among providers. In particular, regulations were introduced to make it easier for private providers to compete for public contracts. Firstly, a system of competitive tendering began in 1993 in which all nine authorities were required to go out to tender for any contracts worth at least 20% of their total budget. Secondly, the government introduced what proved to be a highly controversial measure to give patients greater direct access to private providers outside hospitals. From January 1994, registered physicians and physiotherapists could establish a private practice and be paid on a fee for service basis by the county council without negotiating contracts with the purchasers. In effect, purchasers had a passive role as payers for private services and payments were deducted from the health authority's contracted services budget. The government concurrently increased the fees that could be charged by private practitioners.[11] This must be interpreted as a publicly subsidised build up of a private market for health care.[12]

Other relevant policies

Several other policy changes during the 1990s interacted with the internal market reforms. These included the "freedom of choice" policy that the Swedish Federation of County Councils adopted in 1991.[13] Stockholm County had already given patients free choice of primary care centres in 1990 before implementing an internal market system. At the same time patients were also given direct access to all acute hospital care in the county without referral from a primary care "gate keeper." This policy was integrated with the market model during 1992 when it was decided that "the money should follow the patient." In practice only marginal changes in patient flows occurred,[14] but the result was an inbuilt potential conflict between consumer choice and a purchaser's ability to foresee and control flows of patients.

Major community care reforms (the Ädel reforms) in 1992 transferred responsibility of continuing care of elderly people from the county councils to the municipalities in order to relieve the blocking of acute hospi-

Healthcare reforms in Stockholm County

	Developments in Stockholm	National health policy context
1989	Decentralisation into nine district health authorities	
1990	Planning for Stockholm model Freedom of choice for patients	1990-4 governmental freeze of county council's taxation to level of 1990
1992	Partial implementation of the model: ● Purchaser-provider split ● Performance related reimbursement in five specialties ● Money follows the patient	The Ädel reforms for community care of elderly people implemented by central government Guarantee of maximum waiting time (3 months)
1993	Competition programme launched "Purchaser discounts" introduced Full scale implementation of performance related reimbursement in acute secondary care	
1994	Implementation of performance related reimbursement in geriatrics	Private practice initiative introduced
1995	Political decision to reduce supply of acute care at hospitals	Private practice initiative withdrawn
1996	Cooperation between purchasers encouraged Centralised hospital board to oversee service provision, linked to board coordinating purchasing for all district health authorities Budget caps Committee on structural issues—closure of two hospitals	

tal beds by elderly patients who no longer required such intensive care.[15] The reforms included a system of fines for community care providers who were not able to accept patients back from acute hospitals.

In 1991 extra funds from national sources were used to shorten waiting lists for elective surgery, and by 1992 a guarantee of a maximum waiting time was introduced by the government. This specified a maximum wait of three months for 12 elective procedures.[16 17]

Implementation and retreat

Mounting unease

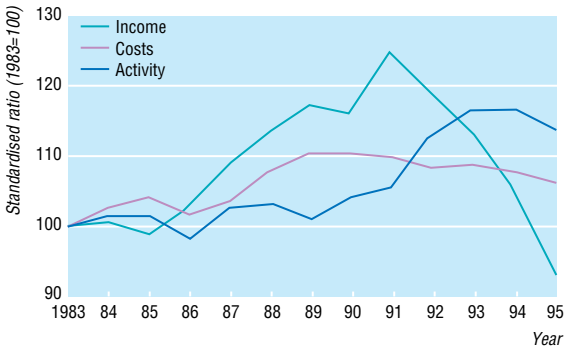
At implementation in 1992 productivity improved almost immediately as elective surgery increased and waiting lists fell. However, most purchasers perceived that costs were increasing, particularly as providers overshot contract volumes.[18 19] The observed effects were attributed to the strong financial incentives, such as the performance related diagnostic related group system, coupled with the weak position of purchasers.[19] By early 1993 purchasers had to introduce penalties for providers who exceeded the contract volume stipulated (purchaser's discount), but plans to extend the diagnostic related group system to more specialties still went ahead.

In 1993 and 1994 the original aim of stimulating activity was replaced by freezing the level of activity and spending less. Quantity related ceilings were therefore put on payment levels and diagnostic related group system prices were lowered. Success in reducing activity and improving productivity was limited,[20] but there was an important side effect. Providers were confronted with uncertainty because of fluctuating prices and rules as well as competitive tendering. This fostered mistrust in the provider-purchaser relationship. The county council auditors in their 1995 annual report concluded that the changes "have drastically diminished the trust in the system."[20]

The fear of loss of cost control was heightened in 1994 when the freedom to establish private specialists came into force. There was concern about the way the measure was consolidating the concentration of specialists in more prosperous areas and transferring more public spending from the public to the private sector. In 1995 the Stockholm county auditors concluded that the increased fee levels for these specialists, rather than an appreciable increase in their numbers, had caused the increased costs.[11 21]

During this period an influential book on markets for health care was published and was widely debated.[12] It warned of the risks of privatisation, the potential irreversibility of these changes, and the threat this posed to the fundamental principles of equity on which the Swedish healthcare system was founded.[12]

By April 1995 a task force of eight leading Stockholm County officials was recommending major changes. They summed up their interpretation of the effects: "We experience a current lack of trust in the Stockholm model .... The trust has probably been further reduced due to the financial deficit of 1994. This unexpectedly large deficit has both external and internal causes. The external factors are related to consequences of the raised level of pay to private specialists, the free right to establish private practice and the family doctor legislation. Among the internal factors we find the problems related to lack of total cost control and deficiencies in administrative systems for monitoring."[22] The task force recommended abandoning the diagnostic related group reimbursement system in favour of block budgets and moving towards cooperation rather than competition.



Healthcare activity, costs, and income between 1983 and 1995 in Stockholm County. Activity is the number of outpatient visits (primary care and specialist, including private care) and inpatient admissions, weighted for the relative costs of these services each year. Costs are total healthcare costs adjusted for the transfer of funds related to the community care reforms. Income comprises the county council's income from regional income taxes, national revenues, and user fees. (Source: analysis from data supplied by Stockholm County Council budget department, June 1996)

Empirical evidence

We have tried to make an accurate assessment of the trends in total activity and costs compared with the perceived trends by analysing data from Stockholm County Council for 1983-95 (see figure). The evidence suggests that the measurable rise in activity rates began sooner than was commonly perceived and that it was related to other developments such as the maximum waiting time guarantee that were not directly part of the market oriented reforms.[16 17] Overall costs did not rise as perceived, but those for specific parts of the service did—for example, in relation to the private specialist development and for some of the secondary care associated with the diagnostic related group system.[11 23]

What the figure also shows, however, is the dramatic decline in the council's income. It was the gap between expenditure and income which grew at an alarming rate and engendered a widespread feeling of loss of financial control. The decrease in revenue from income tax which began in 1991 but accelerated in 1994-5 was a result of the economic crisis in Sweden and the Ädel reforms. Unemployment in Stockholm rose 10-fold (from 1% to 10%) between 1991 and 1992 and affected council revenue after a lag period. In addition to this the government ordered the councils to freeze regional income tax.

The current rethink

A general hesitation and reconsideration is evident in recent political decisions both at the national and county council levels (table). By 1995 the unemployment situation in Stockholm was so grave that local politicians decided to give all county council employees an employment guarantee. This gave the health sector the onerous task of reducing costs without reducing staff.

Also in 1995, the government (now the Social Democrats) withdrew the free right of establishment

Policy implications of reforms

- Simultaneous policy changes at national and regional level with conflicting objectives caused reform overload and hampered systematic evaluation
- Components of the market reforms were ill suited to addressing the underlying problems
- Loss of cost control, erosion of trust, and concern about privatisation were major consequences of the reform process
- Reforms should not be based solely on technical analysis of efficiency and equity in health care in isolation from wider concerns in society

for private specialists. No more establishments were allowed, although those already in practice could continue on less favourable conditions.[24]

In spring 1996 Stockholm County Council took several political decisions aimed at tighter political control rather than market control. For example, in January 1996 it set up a "hospital board" to oversee the provision of services in all county hospitals. This board reports directly to the central political board for health care, which now coordinates all purchasing of hospital acute care over the nine district purchasers.[25] Purchasing now also has to take account of the long term structural plan for services in the county which was drawn up by a new council committee.[26] These changes represent a considerable blurring of the boundary between purchaser and provider and an emphasis on setting up mechanisms for cooperation and priority setting, moving decisively away from competition.

What can be learnt?

This experience holds valuable lessons not only for Sweden but elsewhere. Firstly, the technical aspects of evaluating the reforms proved far more complex than was at first appreciated, as many policy changes were happening at the same time and were interacting. For example, surgical rates went up and waiting lists went down around the time the reforms began in Stockholm—but closer inspection shows that these trends started before the reforms and occurred in other county councils, though they were stronger in Stockholm.[27] It is therefore not clear how much of these changes can be attributed to specific details of the reform package. The experience also emphasises the breadth of the impact. As well as medical and economic effects, questions need to be asked about the effect of reforms on the ethos of the health services—on the development of trust and motivation, for example.[28 29]

Secondly, some of the components of the reform package were ill suited to addressing the underlying problems. In Stockholm features such as fee for service payments in secondary care and capitation in primary care seemed the wrong incentives when cost control and structural changes in supply became political priorities in the 1990s. These incentives were designed to solve "yesterday's" problems of decreasing productivity and access. But when the reforms were implemented the underlying problems—decreasing tax revenues and rising unemployment in society—were completely different and the reform solutions were counterproductive.

Thirdly, the experience illustrates the need for balance between short term and long term objectives. Some short term political objectives of the reforms were to achieve gains in productivity and efficiency so as to reduce specific areas of discontent expressed by influential sections of the population. But a fundamental long term objective of the healthcare system is to preserve equity and trust, to ensure access for people in greatest need, not just those with the most influence. To do this methods are needed to control costs and set priorities, and these must be both efficient and equitable to prevent strong pressure mounting for privatisation. This is the old "trade off" between efficiency and equity, and the latest reform experiment failed to resolve it.

Fourthly, the experience shows that reform should not be based solely on a technical analysis of efficiency and equity in health care in isolation from the wider concerns in society. For instance, questions have to be asked about the long term role of the healthcare system in sustaining the welfare state, politically and economically. In Stockholm, for example, the county council hesitated to make unemployment worse by making health workers redundant to cut costs. Longstanding equal opportunity objectives in Swedish society might also be threatened by cutting the workforce, as a strong health and social care sector releases women from informal care at home and allows them to participate in the workforce. In these circumstances the healthcare system can be seen as part of the welfare state which has a role to play in national strategies such as maintaining high levels of employment.

Like Sweden, other European countries such as the Netherlands are now signalling a move away from competitive strategies, underlining the importance of taking stock of what has been gained and what has been lost by market style reforms in health care.

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Personal paper

Risk language and dialects

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For something which matters so much to us all and is such an important consideration in medicine it is odd that we have no common language for discussing the hazards of life.[1 2] An earlier article contained some suggestions for clarifying our language for describing risk.[3] This paper extends those ideas, setting out several ways in which the magnitude of risks might more easily be presented, understood, and discussed.

Risk, or the chances that a hazard will give rise to harm,[4] is generally couched in terms of numerical odds or probabilities (see table 1) yet research has shown that people find it difficult to digest such measures.[5] One difficulty is that the range of risks is so wide—from, say, the greater than 1 in 10 risk that cancer will be our eventual cause of death to the less than 1 in 10 million chance per year of being killed by lightning. We all find it hard to grasp such extremes.

A logarithmic scale for risk

Risk is not the only area that presents a wide range of size. Other examples include earthquakes, sound, and acidity-basicity. In all these the range is spanned by using a logarithmic scale—the Richter scale for earthquakes, the decibel scale for sound, and the pH scale for acidity and basicity. It is noteworthy that human responses to many sensory stimuli follow a

Table 1 Some risk probabilities (for Great Britain)

Cause of death	Risk (in any one year)
Any cause	1 in 100
Any cause, age 40	1 in 850
Road accident	1 in 8000
Murder	1 in 100 000
Lightning	1 in 10 000 000

Summary points

Better ways are required for presenting risk magnitudes in a digestible form, and a logarithmic scale provides a basis for a common language for describing a wide range of risks

Various "dialects" of this language—visual, analogue, and verbal scales—could help with grasping different risk magnitudes

Combining the above ideas with the idea of anchoring risk magnitudes to the classification by size of human communities produces a "community risk scale"

Factors other than magnitude are important in considering risk, but an appreciation of magnitude is a crucial first step

The proposed risk scales need to be tested to see if and how they improve people's ability to understand and communicate about risks

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Some risk scales

Table 2 Urquhart-Heilmann safety degree scale

Safety degree	Risk
0	1 in 1
1	1 in 10
2	1 in 100
3	1 in 1000
4	1 in 10 000
5	1 in 100 000
6	1 in 1000 000
7	1 in 10 000 000
8	1 in 100 000 000

Table 3 Logarithmic risk scale

Risk magnitude	Risk
10	1 in 1
9	1 in 10
8	1 in 100
7	1 in 1000
6	1 in 10 000
5	1 in 100 000
4	1 in 1 000 000
3	1 in 10 000 000
2	1 in 100 000 000
1	1 in 1 000 000 000
0	1 in 10 000 000 000

Table 4 Distance analogue risk scale

Risk	Distance contains one "risk stick" 1 m long
1 in 1	1 m
1 in 10	10 m
1 in 100	100 m
1 in 1000	1 km
1 in 10 000	10 km
1 in 100 000	100 km
1 in 1 000 000	1000 km
1 in 10 000 000	10 000 km
1 in 100 000 000	100 000 km
1 in 1 000 000 000	1 000 000 km

non-linear relation between perceived and actual magnitude,[6] and something similar if more complex seems to be true for perception of both the magnitude and the importance of risks.[7-9]

It has been suggested that risk (or its opposite, safety) should be measured on a logarithmic scale (table 2).[10-12] A safety scale can be easily turned into a risk scale by subtraction of the magnitudes from 10 (see table 3). A justification for adopting a 0-10 scale is given later.

Measurements of risk are often accurate only to within an order of magnitude, so an integer log scale is sufficient; indeed it can help avoid spurious precision. Where the data allow, however, the basic risk scale could clearly be augmented with finer detail. Decimal points could be added—for example, the risk of death per year from cancer would be about magnitude 7.5 and that from influenza about 6.3.

Here a logarithmic scale is taken to provide the basis for a common language of risk. The rest of the paper is about some possible dialects of this language.

A visual scale for risk

A logarithmic numerical scale helps in the presentation of risks of different magnitudes but it may not help in appreciating just how different these magnitudes are. A visual illustration such as that given in figure 1 can often help. A risk scale spanning more magnitudes could be shown in this manner. This could be achieved without having to resort to multidimensional "hypercubes" by using the final large cube as the "starting" cube for the next three risk magnitudes, and so on. However, this is probably an overly complex approach; the next section describes a simpler method.

A distance analogue scale for risk

An alternative to direct visualisation of risk magnitudes would be to use analogy. One possible analogue scale would be based on distance. For this, the certain occurrence of an adverse event could be represented by a marked stick one metre long. A risk of 1 in 10 could then be represented by the chance of finding such a stick by selecting one at random from a line of one metre sticks stretching for 10 metres, a risk of 1 in 100 by the chance of similarly finding the stick from a line stretching a distance of 100 metres, and so on. Table 4 presents such a distance analogue risk scale.Thus in thinking about a 1 in 1000 risk you would have to imagine searching for a one metre "risk stick" over a distance of a kilometre, for a one in a million risk you would have to consider the task of searching for it from London to John O'Groats, and for a one in a billion risk you would have to imagine searching 25 times round the earth's equator or more than all the way to the moon and back.

A verbal scale for risk

The log scale and its visual and distance analogue expressions help provide a language of risk but these

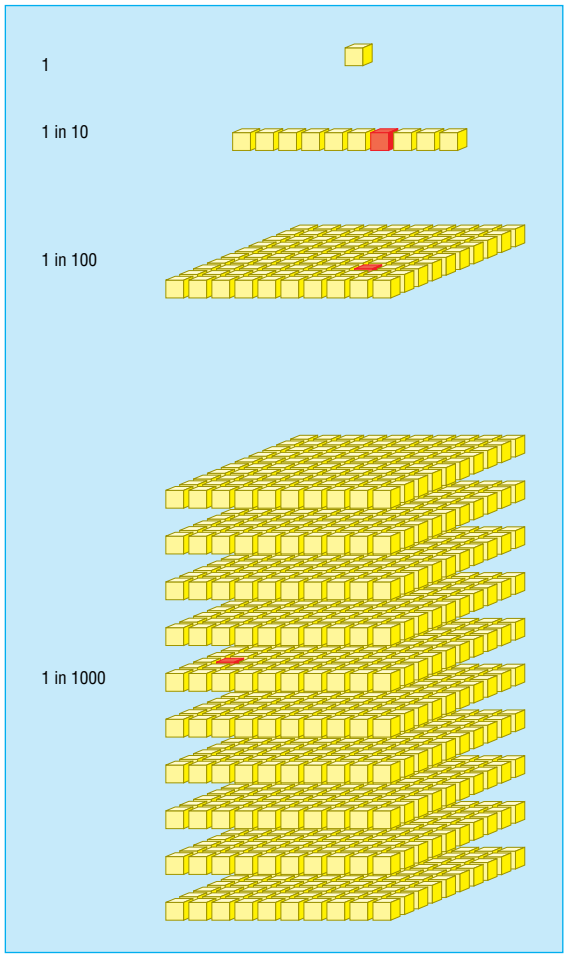

Fig 1 Visual presentation of risk

Table 5 Verbal scale for risk*

Risk range	Risk magnitude	Verbal description
>1 in 100	>8	High
1 in 100 to 1 in 1000	8-7	Moderate
1 in 1000 to 1 in 10 000	7-6	Low
1 in 10 000 to 1 in 100 000	6-5	Very low
1 in 100 000 to 1 in 1 000 000	5-4	Minimal
<1 in 1 000 000	<4	Negligible

*Adapted from Calman[3]

Table 6 Community cluster classification

Grouping	Approximate size	Logarithm of size
Individual	1	0
Family	10	1
Street	100	2
Village	1000	3
Small town	10 000	4
Large town	100 000	5
City	1 000 000	6
Province or country	10 000 000	7
Large country	100 000 000	8
Continent	1 000 000 000	9
World	10 000 000 000	10

are all essentially mathematical constructs. A risk classification based on translating risk probabilities from numbers into words (see table 5) has been suggested.[6] If the difficulties of getting general agreement about what such words mean could be surmounted[13] such a scale could be of considerable help in communicating risk.

A community risk scale

The approach of scaling risk logarithmically and using verbal descriptors could be further developed. The scale could be anchored to something in everyday life which shows large variations in size but can nevertheless be discussed quite easily. We are all interested in what risks mean for us, our families, and our communities. A natural anchor for a risk scale might therefore be provided by the classification by size of human communities. We group communities in roughly logarithmic clusters, from a street of around 100 through a small town of 10 000 to a large country of 100 000 000. Table 6 shows a complete classification of this type. It is, of course, only an approximation as families vary in size; cities often have around a million inhabitants but can be much bigger or smaller and world population is not 10 billion—yet. Nevertheless, it arguably provides a "rule of thumb," and for our purposes this should be enough.

Such a classification should be useful in thinking about risk because it allows risk to be expressed in terms of "you would expect this to happen to around one person in a street, or one in a town, or one in the whole country." Of course the nature of the risk (for example, death or injury), the population being considered (for example, everyone or only those participating in a given hazardous activity), and the time period over which risk is being measured (for example, a lifetime or a year) would always need to be made clear. The first two of these are straightforward enough but the third is sometimes a source of confusion. For instance, the risk of death in a year from regular cigarette smoking is about 1 in 200 (a "one per street" risk); the lifetime risk, however, is nearer one in four (a risk at "one per family" level).

Putting these ideas together yields a community risk scale as illustrated in table 7. The risk magnitudes are now anchored via the community cluster classification. The verbal risk scale—"one per street," "one per town," "one per country"—has its numeric equivalent based on the underlying probabilities. Drawing on the scale in table 3 we see that a risk of one per person (that is, certainty that it will happen to everybody) would score 10 and a risk of 1 per 10 billion people (the level at which it would be unlikely that even one person anywhere in the world would be affected) would score 0. (It seems not unreasonable to set the zero of a risk scale at the level at which nobody on the planet is likely to be affected. If necessary the scale could still cater for even smaller risks, by using negative magnitudes; which seems rather appropriate for risks which are astronomically small.) "Normal" risks would score in the range 9 to 5; anything lower would be most unlikely to affect anybody in your locality. The community risk scale shows, for example, that in any year in Britain you can expect that around one person in your street will die, that one person in your nearest large town will be murdered, and that one person in a whole region will be killed by lightning.

Conclusion

Various ways have been suggested for presenting risk magnitudes using visual, analogue, and verbal scales. These could be anchored to the way in which human communities are clustered by size, which also provides an empirical justification for using a 0-10 risk scale. The various presentational approaches amount to dialects in the language of risk.

These approaches are not meant to be mutually exclusive; a risk situation might be clarified by using several in combination. It might be helpful, for instance, to include a paragraph along the lines of the illustrations in the box in a statement about some new or reassessed risk.

Knowing the magnitude of a risk is just the first step in comprehension. A further step might be made by considering how this magnitude compares with that of some other risk. The information in tables 1 and 7 allows examples of such comparisons. For instance, the risk of being killed by lightning is about one thousandth of that of being killed in a road accident.

Table 7 Community risk scale

Risk	Riskmagnitude	Risk description: (unit in which one adverse event would be expected)	Example (based on No of deaths in Britain per year)
1 in 1	10	Person	
1 in 10	9	Family	
1 in 100	8	Street	Any cause
1 in 1000	7	Village	Any cause, age 40
1 in 10 000	6	Small town	Road accident
1 in 100 000	5	Large town	Murder
1 in 1 000 000	4	City	Oral contraceptives
1 in 10 000 000	3	Province or country	Lightning
1 in 100 000 000	2	Large country	Measles
1 in 1 000 000 000	1	Continent	
1 in 10 000 000 000	0	World	

Examples of use of risk language and dialects

- On the best evidence currently available the chance of someone being affected during a year by this hazard is 1 in 100. This is magnitude 8 on a 0-10 risk scale. This level of risk is analogous to the chance of an individual being selected at random out of a line of people standing one metre apart stretching for 100 metres. In community terms it means that during one year you could expect to find about one person affected in every street. Many people would judge this level of risk to be moderately high compared with other risks of normal living
- On the best evidence currently available the chance of someone being affected by this hazard is one in 1000. This is magnitude 7 on the 0-10 risk scale. This level of risk is analogous to the chance of an individual being selected at random out of a line of people standing one metre apart stretching for one kilometre. In community terms it means that you could expect to find about one person affected in every population grouping the size of a rural village or an inner city housing estate. Many people would judge this level of risk to be moderately low compared with other risks of normal living
- On the best evidence currently available the chance of someone being affected by this hazard is 1 in 1 000 000. This is magnitude 4 on the 0-10 risk scale. This level of risk is analogous to the chance of an individual being selected at random out of a line of people standing one metre apart stretching from London to John O'Groats. In community terms it means that you could expect to find about one person affected in every population grouping the size of one of the largest cities or average county in Britain. Many people would judge this level of risk to be minimal or even negligible compared with other risks of normal living

(In any specific case these statements would also need to make clear the nature of the risk, the time frame concerned, and the population group being considered.)

Risk comparison is a somewhat contentious area, particularly when it involves comparing risks with very different features,[14] but even this can be useful where the emphasis is on conveying a feeling of the magnitude of a risk, rather than on insisting that a given risk must be acceptable if it is smaller, or unacceptable if it is larger, than some other risk that people already take[7]. Comparisons of risks with similar features do not present such difficulties but even then when relative risks are stated it is important also to state the risk in absolute terms. People's reactions to being informed that the risk of treatment A is, say, double that of treatment B may be very different depending on the level of absolute risk. It is likely to matter whether it is appreciated, for instance, that although the risk has doubled the rise is from one in a million to two in a million (rather than, say, from one in a hundred to two in a hundred), as shown perhaps by recent experience with publicity about the risks of third generation oral contraceptives.[3]

As well as the basic probabilistic aspect, risk has many other facets such as the severity of the adverse event in question. Furthermore, people's attitude to risk depends on the context - for instance, whether the risk is voluntary or imposed, whether adverse events are concentrated or dispersed over time or place, and whether the risk is framed in a negative or a positive way.[7 8 14] Whether a hazard is seen as "dread" and whether it is regarded as an "unknown" are particularly important factors; hazards which score high on both these aspects generate especially strong concern.[9 15] It would in principle be possible to extend the risk scales shown to allow for differences in severity of adverse events, or to include more sophisticated risk measures such as years of life lost, or to distinguish between different contexts. However, this could easily overburden what seems best kept as a simple tool for communication of basic risk. The scales should be limited to clarifying the presentation of probabilities of adverse events (such as death or injury), leaving deeper investigation to heavier equipment.

These risk scales are intended to help with the first steps of communication about risk. Of course, they would need to be tested. Their value entirely depends on if and how they improve people's ability to understand and communicate about risks. It is hoped that they will help to provide a language and some useful dialects for risk—risk scales with a human face.

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Correction

How to read a paper: Papers that report diagnostic or screening tests

A correspondent has pointed out an error of terminology in this paper by Trisha Greenhalgh (30 August, pp 540-3). The value described as the negative likelihood ratio and expressed in the formula (1 – sensitivity)/specificity is, in reality, not the negative likelihood ratio but a value which is described by the question, "How much more likely is a negative result to be found in a person with, as opposed to without, the condition?" The negative likelihood ratio is described by the question, "How much more likely is a negative result to be found in a person without, as opposed to with, the condition?" and is expressed by the formula specificity/(1 – sensitivity). In the example given, a negative urine test for glucose does indeed reduce the window cleaner's baseline chances of diabetes to 0.78 of the pretest likelihood, but the negative likelihood ratio of the test is the reciprocal of this value—that is, 1.28.

An attempt to save money by using mandatory practice guidelines in France

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See editorial by Dixon

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Summary points

Mandatory practice guidelines were introduced from 1994 and 1995 as a way of cost containment and of standardising patient care

The system was developed by an independent agency after 1994 and agreed by representatives of the profession, the French social security administration, and the government

Practice guidelines apply to medicine and surgery, diagnosis and treatment but hospital practice is excluded

Doctors who do not comply can be fined up to £2000; in 1996, 186 were investigated and 75 were fined

The rate of increase of expenditure on medical services outside hospital has decreased since the system was introduced

Limitations include the lack of outcome assessment, possible shifts in expenditure from outpatient to inpatient services, and the fact that enforcement is difficult and costly

In the five years up to 1996, expenditure on healthcare in France increased at an average yearly rate of 4-5%; by 1996 it amounted to about 10% of the gross domestic product.[1 2] Various cost containment programmes have been proposed and implemented, many assuming that high costs are a result of unnecessary tests and treatments. We describe and make a preliminary assessment of the latest of these, introduced in France from 1994 onwards, which combines mandatory practice guidelines on procedures and drug prescribing with a system of fines for doctors who do not comply.

Background

Two thirds of French doctors are in private practice and are paid on a fee for service basis. The French social security administration provides medical cover for 99.6% of the population, and 80% of the fee the patient pays to a private physician is reimbursed by social security. Private insurance companies reimburse the remaining portion for most people. The social security administration and the doctors' unions have negotiated contractual medical fees and these are paid to most general practitioners and to 60% of specialists. Basic fees per consultation in 1997 were F110 (£11) for a general practitioner and F150 (£15) for a specialist but additional fees could be claimed for medical or surgical procedures performed during the consultation. Thus, physicians receive most of their income from social security.[2]

The French healthcare system has historically provided freedom of choice for patients and doctors. Patients can see any general practitioner or specialist they choose, with no limit to the number of doctors seen or the frequency of visits. Doctors have been free to request any investigations or procedures and have prescribed as they pleased—with the exception of a few drugs restricted to hospital use. This combination of freedom of choice, the high proportion of medical expenditure covered by social security, and the higher costs associated with medical advances inevitably resulted in increased expenditure.

Traditional cost containment measures, including capping total hospital expenditure, reviewing prescribing practices, and asking patients to contribute to costs, combined with continuing medical education and consensus conferences,[3-6] have not controlled the increases in expenditure in France, in particular those of medical care outside hospital.[2]

Medical practice guidelines

A containment policy for healthcare expenditure became law in August 1993 (Loi Teulade 93-8). This introduced mandatory medical practice guidelines, known as références médicales opposables. These form a negotiated contract signed by the social security administration and unions representing doctors in private practice outside hospital. The guidelines aimed to limit the prescription of redundant and costly drugs, tests, and procedures by fining physicians who overprescribed and to improve the quality of care.

Redundant prescribing meant either that a harmless prescription was not required, given the

FLORENCE DURAND/REX FEATURES

French doctors who do not follow prescribing guidelines can be fined

patient's condition, or that the benefit did not justify the risk of harmful side effects. The costliness of a prescription was considered from the viewpoint of the payer. The guidelines attached two indices to each item, one for redundancy or harm and the other for direct cost.[7-9]

The first guidelines, published in 1994, were produced solely by the health department of the social security administration. New guidelines were developed in 1995 and 1996, using a scientifically validated procedure.[10 11] Their development was supervised by an independent organisation, Agence Nationale pour le Développement de l'Evaluation Médicale (ANDEM). ANDEM assessed the scientific evidence and professional consensus for each guideline but did not consider the economic implications of practices or set the level of fines for non-compliance. Thus, a clearer distinction was made between scientific and economic issues. Altogether 147 guidelines covering medical and surgical topics, diagnosis and treatment were issued in 1994 and 1995 (see box).

Methodology

Selecting topics

The social security administration and representatives of doctors' unions had the sole responsibility for selecting topics. The criteria set for selecting topics were medical and economic, and included high cost, high prevalence, high risk, and high variation in practice patterns.

Reviewing the evidence

Practice guidelines were established by ANDEM with reference to published work.[12-17] Medical societies, university physicians, and experts were charged with reviewing and editing the final wording. The social security administration then selected those that were most feasible and relevant to medical practice outside hospital.

Implementing the guidelines

The first group of guidelines was published as bylaws in March 1994, six moths after the Loi Teulade. The indices of medical redundancy or harm and of cost were published together with fines for non-compliance as part of the bylaw. The index value of redundancy/harm could be 0.5 (redundant but no iatrogenic risk), 1, or 1.5 (presence of appreciable iatrogenic risk). The index of costliness could be 1, 1.25, and 1.5, corresponding to three levels of increasing expense.

The guidelines were applied immediately after their publication and the enforcement procedures after a two month observation period. The number of violations per doctor was determined by doctors from

Topics selected for mandatory practice guidelines

1994 guidelines:*	1995 guidelines:†	1996 guidelines
Prescription of non-steroidal anti-inflammatory drugs	Cholecystectomy	Lipid lowering treatment
Prescription of antibiotics	Hysterectomy	Chronic venous insufficiency of the lower limbs
Diagnostic imaging of back pain	Knee surgery and exploration	Invasive techniques for coronary artery diseases
Systematic blood and urine testing	Lower back pain	Appendectomy
Testing during pregnancy	Prostate cancer (non-invasive)	Treatment of gastric and duodenal ulcer
Treatment of non-insulin dependent diabetes	Prostate adenoma (benign)	Diagnosis of viral hepatitis
Digestive endoscopy	Carotid endarterectomy	Physiotherapy
Thyroid function tests	Coronary bypass surgery	Urinary infection
Treatment of hypertension	Ocular implants	Current diagnoses in haemotology
Treatment of hypercholesterolaemia	Laser in ophthalmology	Hysterectomy
Magnesium blood and serum concentrations	Tympanostomy tube insertion	Sterility
Preoperative tests	Surgery for deafness	Asthma
Mammography screening	Dental and maxillary anomalies	Long term oxygen therapy for chronic respiratory insufficiency
Ulcer	Cervical smear screening for uterine cancer	Antidepressant drugs
	Diagnosis of pregnancy using chorionic gonadotrophic hormone	
	Electroencephalography	
	Electromyography	
	Pulmonary function tests	
	Exploration of gastro-oesophageal reflux in neonates and children	
	Management of psychotic patients	
	Hypnotic and tranquilising drugs	
	Prescription of neuroleptic drugs	
	Immunohistochemistry tests in pathology	
	Acne	
	Vasoactive drugs in the treatment of arterial ischaemia	
	Skin cancer	

*Developed by social security administration and doctors' unions.
†Developed by Association Nationale pour le Developpement de l'Evaluation Medicale, social security, and doctors' unions.

1994 guidelines on ulcer treatment

"Ulcer treatment" was covered by three practice guidelines on drugs for and duration of treatment (all categories of anti-ulcer drugs were allowed but all antacids were excluded). There are no grounds for:

- Simultaneous prescription of two anti-ulcer drugs
- Prescribing a treatment for duodenal ulcer for more than six weeks except when symptoms persist
- Prescribing anti-ulcer drugs for chronic gastritis

For all three guidelines the index of redundancy or harm was 0.5 and the cost index was 1.25. This meant that doctors who violated guidelines 9-16 times (for their entire patient population) in a two month period would be liable to pay a maximum of £400; for 17-24 violations the fine would be £800; and for were more than 24 violations it would be £1200.

Treatment for *Helicobacter pylori* was not mentioned; this was included in the recommendations of the October 1995 consensus conference held in Paris.

the health department of the social security administration, who sampled prescriptions over two months.

Each fine, varying from F1562 to F11 250 (£156-£1125), was determined by a weighted combination of the indices of redundancy or harm and cost and of the total number of violations. The number of violations by each doctor was estimated for the doctor's entire patient population (roughly 4500 consultations per year). A threshold for the minimum number of violations needed for legal action against a doctor was established for each guideline. The lowest threshold before a lawsuit (three violations in two months) concerned prescriptions of non-steroidal anti-inflammatory drugs and sulphonamides. The highest threshold (13 violations) concerned requests for investigations: full blood investigations, ultrasound performed more than three times during a normal pregnancy, repeated thyroid tests in the absence of clinical symptoms or signs, repeated electrocardiography in patients with moderate hypertension, repeated blood cholesterol and triglyceride determinations in patients with no risk factors or in those on cholesterol lowering treatment whose cholesterol concentrations were stable, and preoperative tests (blood work, electrocardiograms, and chest *x* rays).

Evaluation

Compliance

Doctors were asked to indicate on every prescription form whether or not the item was covered by a guideline. A total of 13 000 doctors (roughly 10%) was surveyed over two years. Altogether 1278 were peer reviewed, and proceedings were taken out against 186; 75 were eventually fined.[18]

Expenditure

The average increase in expenditure for health services outside hospital was 2.3% per year in 1994 and 1995 compared with 6% previously. Total pharmacy expenditure rose by 1.3%, compared with 7.4% in 1993, and the total volume of tests requested fell by 15% (tests had increased by 1% in 1993). Volumes of medical and surgical procedures were not studied. Expenditure actually changed in 1993, when the decision about forthcoming medical practice guidelines was announced. We believe that doctors anticipated the controls and voluntarily limited their prescriptions.

In 1995, data were drawn from a sample of 2300 doctors participating in a four year survey (1992-5) of prescribing practice and included the name, type, and dosage of all drugs prescribed as well as diagnostic codes (international classification of diseases, 9th revision).[19] The annual total of prescriptions collected varied between 154 000 and 218 000 yearly. The number of drugs prescribed per doctor, the name of the drug, and costs were determined for the drugs covered by the guidelines before and after they became law. The cost study covered both the reduction in prescriptions and the possible substitution of drugs not included in the guidelines. The overall net reduction in drug expenditure, extrapolated to the entire country, was estimated to be about F337m (£34m). It was estimated, however, that if practice guidelines had been applied scrupulously by all doctors the estimated savings for drugs prescribed outside hospital would have been F1.16bn (£116m). Compliance was best for antibiotics and non-steroidal anti-inflammatory drugs (40-45 % of prescriptions were written according to the references), and worst for antihypertensive drugs, corticosteroids, and drugs for diabetes (5-15%).

Cost shifting

These guidelines do not apply to hospital practice, which means that the current system does not address the issue of continuity of care; inpatient and outpatient budgets and practices are clearly separated. The increase in hospital expenditure was reduced by government decree from 6% to 4% in 1994 and to 3% in 1995. There may have been "cost shifting" to hospital services after the implementation of the guidelines but the current information system does not permit cross checking between patients' data and resource use. However, because hospital expenditure was capped there was no change in the trend after the guidelines were introduced.[1]

Quality of care

No means of measuring the effects of the guidelines on patients' outcome and satisfaction were planned. Laws (ordonnances) signed in April 1996 mean, however, that healthcare providers must present data on quality of care; a yearly regional assessment of the state of health is to be implemented via medical surveys and questionnaires.

Issues for debate

The main principle behind the guidelines was that reduction in prescribing would cut costs while maintaining the same level of effectiveness of patient care, a concept that needed the support of strong scientific evidence to make it acceptable to the medical profession and the public.[20 21] None the less, enforcement was also considered necessary because doctors did not seem to have sufficient trust in guidelines or had incentives to disregard them.[21 22]

Legitimacy

The legitimacy practice guidelines being issued by the body that is paying for medical care could be questioned. The first guidelines in 1994 were criticised because of methodological flaws and possible conflicts of interest. The second group, issued in 1995 and 1996, were written by panels of experts in each field and appeared first as scientific recommendations. The procedures that rendered the guidelines mandatory were the sole responsibility of the social security administration and doctors' unions. In total 147 practice guidelines have been published, 90 of them derived from the clinical practice guidelines published by ANDEM.

A survey commissioned by the social security administration found that doctors considered that guidelines could be useful in explaining to patients why tests or drugs could not be given and to counterbalance any pressure from patients and their families. Medical unions expressed the discontent among doctors in private practice, but doctors who protested against the reform had little leverage, as they were paid by the social security administration.

Difficulties and costs of enforcement

As French law forbids collecting data on health that could be traced back to an individual, details of tests and drugs may not be entered on computerised patients' records. All checks on the implementation of the guidelines had to be performed manually on a sample of prescriptions written by doctors being surveyed. All reimbursement claims sent to the social security archives are matched against the original prescription. To check the prescriptions written by one doctor in two months took two months' full time work (300-350 hours). This underestimates the true costs: it does not include the time spent retrieving claims and covers only drug prescriptions, not requests for tests.

Expansion and revision

The rapid change in medical knowledge and technology limits the credibility and medical relevance of the guidelines and the validity of enforcing their use. For example, the 1994 guideline for ulcer treatment (based on 1993 scientific data) had to be revised after the importance of treatment for *H pylori* was acknowledged in 1995. Published guidelines need continuous revision; each year new guidelines addressing 20-30 new topics should be commissioned.

Will it work elsewhere?

The extension of mandatory guidelines to hospital medicine is under study; most guidelines issued in 1995 were considered suitable for hospital practice. Government policy was the route chosen for Implementing change in physicians' behaviour because of the centralised financing system in France. Replication in other countries with centralised financing could be possible; in some countries the regional level might be more appropriate. Only a centralised healthcare system with relatively weak medical unions could introduce such a system since guidelines have to be universal and the paymaster has to have both leverage over doctors and government support. This may apply to some European countries, but is more of a political than a medical issue.

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Endpiece

What's a parameter?

Parameter: A mathematical term of some complexity which has become perceived by the general public as having the broad meaning 'a constant element or factor, esp. serving as a limit or boundary'. This meaning is still at the controversial stage, the stage at which dictionaries and usage manuals attach the word 'loosely' to the popular meaning, while mathematicians smile knowingly and exclude the word from their social vocabulary. Anyone feeling uneasy about *parameter* has a wide choice of near-synonyms to choose from: *border, boundary, criterion, factor, limit, scope,* etc.; one of these is normally more suitable in context.

Robert Burchfield, *Fowler's Modern English Usage*, Clarendon Press, Oxford (1996)