

The Health Endeavour of the Future

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Health systems in many countries face potentially great change. Increasing automation will mean a different role for humans and robots - each might be used for what each does best. The nature of hospitals might change too. Hospitals will be used for surgery and for concentrations of expensive equipment. Otherwise much care will take place in private residences or in the hotel sector. More attention will be given to remaining well, relative to treating illnesses once they have developed. The Human Genome Project offers great prospects for knowing more about humans and for intervening more effectively in foetuses and babies.

Let us imagine. Let our minds run free. Let us clear out our previous ideas and imagine anew. Let us clear out what we have now, what we know, what we are used to. Imagining is a radical idea - it invites us to go beyond what we know and have now, into a future that we can only guess.

Health, particularly, lends itself to lateral thinking. It is ready for a new paradigm. It is, at the present, operating within old ideas of seniority, old relationships and those old ideas of vertical hierarchy with which so many of the practitioners were trained. If we do some imagining, free of past or present strictures, free of past or present structures, we could imagine varied futures for health. True, we will have to devise a process to bring present practices into line with our imagined future, but that is a second step.

To do some original thinking we have to move beyond present forms, present structures and present activities. "Imagine Chicago" was an exercise in which American schoolchildren imagined what that City might be like in the future. They were allowed to imagine anything they wanted.

Remember that medical practitioners once wore posies of flowers in elaborate masks to hide smells, believing that bad smells produced disease.

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They were both wrong and were prisoners of their own current thinking. Not that errors were necessarily malign - the great sanitary revolution of the Nineteenth Century generally preceded knowledge of microbiology and was based on a theories of smells and of "miasmas" which just happened to be wrong, yet were susceptible to microbiologically-based public health interventions.

If we let our minds really move freely we could ask some of the following questions for any particular region:

- why do we have the current system of care?
- what drives and perpetuates the relations between carers and those cared for?
- why do so many people move today outside the established system?
- have some of the conditions which led to the present system changed?
- have some new developments introduced new possibilities for health delivery?
- is the current system right OR is it just what we have now?
- is the current system designed for us as consumers or for providers of care?
- might we do better?
- can we predict already what some of the coming changes will be?
- do those changes mean that we might view curative and preventive efforts differently?

There is no *a priori* reason why the current system is optimal, or why it should be appropriate for the future. Conditions in some countries have changed; for example, we can now intervene effectively in more diseases - previously this was rarely the case.

While it is difficult to imagine how research might proceed, it is possible to make some confident guesses. It is certain that technological capacity will increase apace, so that we can do more technically, can introduce techniques not now thought of, can detect and treat illnesses in ways not now envisaged. It is likely that robots will be developed that can take over more repetitive or routine roles for us. We can predict that the Human Genome Project will increase our understanding of humans, will make it easier to predict certain diseases, and will make it possible eventually to treat certain diseases. Among those diseases might be cancer which seems to have predictable chromosomal abnormalities that might be receptive to special environmental stimuli to become active - that is, to pro-

duce clinical cancer as we know it.

It will all be more expensive. Costs have been rising fast and there is no compelling reason to think those rises will moderate. A "best guess" might be that costs of medicines and medical equipment are likely to rise faster than the cost of living generally, and the costs of public hospitals are likely to leap ahead too.

Let us spend a moment on health promotion, on the prevention of illness, of just remaining healthier. Much of the gain of the past Century has been from simple public health interventions which have still not been tried *in extenso* in some poorer countries. Just by giving more people clean water to drink, just by removing rubbish and sewage, just by vaccinating more children, just by improving nutrition, just by introducing effective contraception, we could improve the conditions of millions. But the general thesis is worth reiterating. Many millions of people would live if some of the old interventions in public health were offered to them. They would do this without any extra access to tertiary care, or to some of the more expensive medications. This could all be done today in both developed and developing countries using what we already have and know.

The "health system" of many countries would look very different if we moved just to do these things.

There is more that we could do - after all, 20% of the population smokes tobacco, not enough people take aerobic exercise, too many people are obese, and so on.

But there will be more. We will discover more about our foods, more about pesticides, more about chemicals - things that some people suspect today. We will be able to look after ourselves in new ways, to avoid some damaging agents, to keep some substances out of our food and our environment, to recognise and respond to chemical allergies.

We may know more about which things have evidence behind them and which practices are just "traditional" - gradually these latter practices might be discarded.

An old medical cartoon shows a cliff over which people fall. It is possible to put a fence at the top of the cliff to stop people falling (equivalent to health prevention) or to put a fleet of ambulances down at the bottom (equivalent to our present care system). And when we come to consider illness - often called "health" in some inversion of reality - those who have fallen over the cliff - we find great new possibilities.

There is no *a priori* reason why individual care practitioners need to sit down with individual care seekers tomorrow as they do today. That is

not to say that they would not sit down at all. It means that they will do it differently.

It seems that the health professional today does tasks, which include:

- listening to troubled people
- interpreting the symptoms, separating important and significant ones from the others;
- eliciting the signs
- monitoring progress of people over time
- giving individual treatments, including (say) massage and surgery
- conducting health promoting activities such as immunisations
- conducting activities such as routine "pap" smears for the earliest detection of illness.

There is no reason that robots could not do much of the mechanical or repetitive part of what we spend our time doing today - and do it well. For example, robots could help with early diagnosis and robots could do much of the labour in surgery. Robots are already doing much labour in keyhole surgery - under the direction of trained surgeons.

What is more, robots are likely to do the job better than do humans. They would work all day and all night without becoming tired or hungry. They would be expensive to provide (like highly trained people are) but cheaper to operate. They would perform predictably. They would carry out mechanical tasks consistently.

Computers could work on our symptoms if they develop appropriately - we are awaiting computers able to handle "open" questions and answers for this to happen. ("Open" questions are those to which a "yes" or "no" answer is not possible. A famed television announcer reminisced that one of his "blooper" tapes included a long "closed" question to the author that was answered with a single "yes"). While more modern computers are addressing this question more effectively, there is no generally available computer that can handle these "open" questions. Computers could elicit our physical signs - and could do so consistently and predictably. Computers might come as small units implanted into our bodies, either as "smart" chips or as tiny units inserted into our bloodstreams.

Robots, computers or some applications of nanotechnology could make all necessary analyses of changes in our bodies. They could (if they develop) take all our personal information, could interview us, could receive information from human interviews, could recover relevant past information,

could determine which diagnoses were possible, could order investigations, could arrange data for later presentation to humans, and could suggest treatment. Such robots could include small implanted devices that would ascertain, without our help, our progress. Imagine what that could mean for diabetics today - especially if an implanted device was connected automatically to an insulin pump - always assuming that we still have a disease in the future with that name and those characteristics (many developments in human genetics make it increasingly likely that there will emerge a capacity to modify or remove certain genetic combinations from people).

Computers could suggest treatment from among the available modalities and could track progress according to some appropriate algorithm.

Humans would design and program these automata. Humans would still have control. Humans would still "run the show".

What medical practitioners are especially or potentially good at is dealing with other human beings. 'Potentially' because many people turn now to other than medical practitioners, many of them alternative practitioners, because they communicate better than medical practitioners. Perhaps this is where humans could be most used - to relate, to listen, to care.

What is most valuable in a carer is sympathy, someone to care, someone to listen. It really does not help if someone is correct technically but is a pig. Many poignant accounts from doctors tell of their loneliness when they were dying and colleagues refused to engage with them. Recently in a feature film some young medical students were told by a teacher that he would "knock the empathy out of them" before he was finished - this may be conventional, but it is wrong for people not to care about each other.

If we turn to hospitals, there is no real reason why we will need them as we have them now. They are expensive to build, expensive to maintain and expensive to repair. They are expensive to staff. They are difficult to run. They are where the dangerous organisms are found. What they do well is that they treat disease well. They are places where people understand disease and they have collections of expensive equipment and operating suites concentrated in one place for people to use.

If we identify these good things that hospitals do, there may be other ways to have them happen in a wired world and places other than hospitals for some of them to happen in.

Once a very rich man wanted to be nursed in his harbourside mansion in Sydney. He had a serious illness, but it was treated successfully at home.

It was possible to get the people and the equipment to him where he wished to be.

Perhaps this will become more frequent. It might even become the norm.

We will bring the equipment and the people to where the patient is, rather than bringing the patient to where the people and equipment are. We will be limiting exposure to troublesome germs. We might inconvenience staff, but we would act in the interests of people. Alternatively, if equipment cannot be moved, people might come to it but might do so from their homes. The residential function of institutions will be less important. Many famous institutions now use motels rather than hospitals for ambulant suffering people - and why not? Why not use the expertise of the private hotel sector appropriately?

At the present we all die - in future if this changes, we will have to address a lot of consequential questions which have to do with population, space, food and so on - the whole Malthusian business. At present we are not good at handling dying or the life which old people lead. Just imagine a society full of old people on a planet of fixed capacities - we may move some of our burgeoning population into the galaxy quickly enough in this Century, but we are likely to move outside the galaxy more slowly.

Marginal and incremental changes may be practical and capable of achievement, but they are not brave. They are a betrayal of the future. If we make only incremental changes future generations will not thank us for our timidity.

We all have a chance now, at the beginning of this Millennium, to rethink what we do. Some of us will be more comfortable arguing about priorities within what we do now, but let us be brave and expansive and move beyond the present.

The question is: will we? The temptation will be to upset the fewest numbers of people and this may lead to less change than will be necessary to serve new and different populations in a new and different age. "Systems" will ask us to make only incremental changes, to recognise and accommodate existing relationships between groups of people - but this is not the way to effect the changes that are needed. In some countries there may be a desire by an elite to introduce tertiary medical care when the majority of the population lacks still the basics of clean water, rubbish and sewage removal, and basic medical care. Such a priority would not only be foolish and wrong, but it is also economically unsound. In fact, many countries would gain economic advantage by not supplying sophis-

ticated services themselves, and by evacuating to existing services those of their citizens who required advanced treatment.

So let us be ready to embrace the changes which are facing us. The challenges are here and will not go away. To meet those challenges we must be ready to imagine and to dare - the question is: will we?

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