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New sources of value for health and care in a carbon-constrained world

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ABSTRACT

Background Due to the climate crisis, it is increasingly evident that countries will have to decarbonize. Healthcare, which has a large carbon footprint and uses vast quantities of resources, will have to undergo significant transformation. In this research, we sought the ideas of leading thinkers in the field, to address the question of how health systems can provide high-quality care in a carbon-constrained world.

Methods Semi-structured, qualitative in-depth interviews with 15 healthcare thought leaders from Australia, the UK, the USA and New Zealand. The interviews were transcribed and analysed by matrix display and thematic analysis.

Results 'Green' initiatives such as improving energy efficiency and implementing travel plans will be insufficient to achieve the scale of decarbonization required. According to the thought leaders in our study, it is likely that greater carbon and resource savings will come from thinking much more broadly about innovative models of care and using 'new' sources of 'value' such as 'people' and 'relationships'.

Conclusions Using human resources and human interactions as low-carbon sources of value in healthcare are promising models.

Keywords climate change, decarbonization, environmental sustainability, value, people, relationships

Introduction

At the 21st Conference of the Parties (COP21) in Paris in 2015, 195 countries committed to the global goal of holding temperature increase to well below 2°C (and ideally to below 1.5°C) above pre-industrial levels.[1] This collective goal requires a transition towards a fully decarbonized world.[2] The health sector has a large carbon footprint.[3,4] Along with other sectors of the economy, the health sector will increasingly be required to demonstrate how it is monitoring and reducing its carbon footprint. At the same time, healthcare systems are demonstrably failing to meet the challenges of modern society. Observers cite our failure to address issues such as complex and chronic disease, inequality, mental health and addiction, as well as escalating financial costs, as evidence that a fundamentally new approach is required.[5–8] The climate crisis provides an additional impetus for such a transformation.[5,9–11]

Therefore, a key emerging question is 'how to provide quality healthcare in a carbon-constrained world'. In this article, we report and reflect on thought leaders' responses to this question, identifying several main themes. This is a nascent field in healthcare and these are preliminary concepts: 'ideas for solutions', rather than proven answers.

Methods

During the first year of research, a list of prospective interviewees was compiled. The sampling was purposive.[12] The criteria for inclusion were as follows: (1) health professionals whose innovative and visionary thinking and/or experience sets them apart from the mainstream 'managerial' mindset in

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healthcare and (2) either specialist knowledge in a relevant field, senior level management experience or first author of a seminal publication in the field. An interview guide was developed based on previously verified questions.[6,13] Two pilot interviews were conducted and the interview guide was revised. The first three of the six core interview questions—those questions that are relevant to the themes discussed in this article—are shown in Box 1. The interview list was prioritized and participants invited sequentially for interview. The interviews were semi-structured, with the in-depth and narrative enquiry interviewing techniques used.[12,14,15] Interviews continued until data saturation.[12]

Audio recordings were transcribed and an iterative process of thematic analysis undertaken.[14,16,17] Codes were generated manually and coded data extracts entered into a matrix. Colour-coding of the data extracts provided a visual representation of preliminary themes[17]; these were reviewed to identify several overarching themes. Four of the audio recordings (>25%) were independently analysed by a second person to ensure validity.[12] The analysis was primarily at the semantic level,[18] and included elements of inductive and deductive approaches.[16]

Results

In total, 20 healthcare thought leaders were invited to interview. Two declined, two failed to respond (despite follow-up) and one cancelled several days before the interview for personal reasons. Therefore, the response rate was 75% (15/20) and there were 14 interviews (1 joint interview). Six interviewees were from Australia, five from the UK, three from the USA and one from New Zealand. Interviews were conducted between May and November 2015, by phone,[9] Skype[4] or face-to-face[1] and ranged from 28 to 83 min with a mean duration of 54 min. In the following text, to maintain confidentiality of interviewees, they are referred to by numbers known only to the researcher.

The main themes of this article are presented in Table 1 and discussed in the 'What this study adds' section of the Discussion.

Discussion

Main finding of this study

In this research, when asked what an environmentally sustainable health system might look like, leading thinkers in the field suggested that we need to consider 'new' sources of value such as harnessing human resources and interactions. They described ideas for providing high-quality healthcare with significantly lower carbon and resource use.

What is already known on this topic

Our current healthcare systems are highly carbon- and resource-intensive. The environmental imperative of the climate crisis means that we will have to transition to low carbon models of care.

'Green' initiatives—energy efficiency, active travel schemes, etc.—are underway in many healthcare organizations. However, these measures are insufficient given the scale of decarbonization required.[3,19] The most recent carbon footprint of the health and care system in England found that building energy use and travel (for patients, staff and visitors) are only 18% and 13%, respectively, of the total carbon footprint. The main carbon emissions come from a range of procurement items, including pharmaceuticals, business services and medical instruments/equipment.[3] Therefore, rather than focusing solely on energy and travel, we need to think more broadly and creatively about new, less carbon- and resource-intensive, models of care.[9,20]

What this study adds

Thought leaders suggested taking a 'big picture' approach. Interviewee 1 said, 'actually the most environmentally sustainable thing would be to not have people get sick in the first place!' and there was in-depth discussion about prevention, wellness and broader primary care, some citing models such as medical homes and health campuses. Most of the discussion was about the need to fundamentally rethink and redesign healthcare in view of the health challenges of modern society, the resource constraints (carbon and economic) and community wishes and expectations. Interviewees thought that this process would take a decade or more. The

Box 1

PART I of the INTERVIEW GUIDE: an environmentally sustainable healthcare system.

(1) What do you think are the strengths and weaknesses of the current healthcare system?
(2) What would an environmentally sustainable health system look like? What would be the underpinning values?
(3) Do you know of any examples of elements of this environmentally sustainable system which already exist?

Table 1 Overarching and sub-themes

Theme	*Theory (synopsis)*	*Key quote or example from the interviews*
Overarching theme		
People and relationships	Utilizing peoples'—patients, peers, communities and professionals—inner resources and abilities as well as the interactions between people (relationships) are a low-carbon source of value in healthcare	'I … think that the current health systems don't really use the biggest resource we have which is people themselves …'—Interviewee 11
Sub-themes		
Patients' inner resources	Models such as patient empowerment, mutual responsibility, improved health literacy and professionally guided self-care which utilize patients' inner resources can provide value	A system which is 'genuinely empowering of individuals and families and friends and communities'—Interviewee 8
Peer-to-peer	Peer-to-peer support models harness the knowledge and empathy of people with the same or similar conditions to improve health outcomes and patient experience	Interviewee 15 provided the example of a local diabetes prevention programme in which the most effective trainer was a janitor who had himself completed the programme: 'he's a "real guy" and he lost a lot of weight, and there's nothing fancy about this guy, and people trust him …'
Health workers	New roles, merged roles, team-based working and more generalized professional roles (a reversal of the current specialization trend) may provide more value in healthcare	Interviewee 1 said: 'usually what happens … when you get these … paradigm shifts is that completely new roles emerge that you hadn't really imagined …'
Community-based health	Broadening the definition of the public health workforce and better utilizing existing networks of social and health sector workers may increase social value and health outcomes	Interviewee 15 described the partnering of a healthcare organization in the USA with a community-based non-profit organization of 'promotoras'. Promotoras are lay health workers—'trusted folks' who work with people in their community to support and promote health
Ageing: burden or resource?	Aged care could be reframed around harnessing people's abilities, rather than managing their decline	'… we're talking about [ageing] as if it were a problem, rather than one of the biggest blessings in human history'—Interviewee 8

future system, said Interviewee 7, is likely to be a 'completely different experience, delivered differently, but how that would look … is very hard to know.' Interviewee 10 posed the question: 'How could we get better health from less healthcare? How can we get more health, and more fairness, from less healthcare and better healthcare …? That's the question.'

The principle message, then, was the need for more creative thinking in healthcare. Interviewee 8 reflected that we need to 'somehow imagine an approach to care that is radically different; but the issue though is whether you're responding in … the mindset that caused the problem, or the mindset that can solve the problem'. 'Value'—that is, the pursuit and attainment of quality health outcomes with low resource (carbon and monetary) use—emerged as a key concept.

Four interviewees suggested that such an approach would entail reducing 'low value' activity at the same time as seeking new sources of value. That is, thinking about healthcare '… in a whole lot more sophisticated way, in mobilizing the whole other range of resources over and above the current … configuration' (Interviewee 7). The first part—eliminating low value activity—is emerging in some settings with the advent of practices such as deprescribing and the growing recognition of the harms, risks and costs of overdiagnosis and overtreatment in initiatives such as 'Choosing Wisely' (http://www.choosingwisely.org/). The second part concerns innovative models of care and seeking novel sources of value. In our research, one overarching theme was to make greater use of 'people' and 'relationships' as a source of value in healthcare.

Overarching theme: people and relationships

'I … think that the current health systems don't really use the biggest resource we have which is people themselves …' said Interviewee 11. From Interviewee 10: '… the other part is to … increase the positives around social value, using the biggest resource you've got in the system which is the public and the patients'. Lastly, from Interviewee 8: 'more self-care, more mutual care, much "less" dependent on technological interventions; be genuinely empowering of individuals, families, friends and communities'. That is, finding and utilizing people's—patients, peers, communities and professionals—inner resources and abilities.

The other source of value is the interactions between people: "relationships". There is growing evidence that human relationships—social capital and social networks—are important and independent determinants of health.[21–24] Further, it has been demonstrated that person- and community-centred approaches improve health outcomes and experience, reduce social isolation and loneliness and foster community capacity and resilience.[25] Seven interviewees spoke at length about this, including Interviewee 7: '… there are certain illnesses that are amenable to quite quick fix healthcare interventions. But if you look at the broad burden of disease today, much of it is a consequence of this alienating model in society that we've created for ourselves'; and: '… human to human respect and bonding … it's something that we've lost in our modern society …'.

Over the past two decades, SouthCentral Foundation in Alaska has transformed itself from one of the worst to one of the best-performing healthcare organizations in the USA.[26,27] They redesigned their system from a 'linear, standardized, non-integrated, provider driven model' to one fundamentally centred on human relationships.[28] Five interviewees commented on this approach: 'I think relationship is important to a lot of people; I just don't think that a lot of healthcare … systems have realised the impact that a relationship can have on the provision of healthcare, the success of healthcare …' (Interviewee 12). From Interviewee 15: '… having a sense of purpose and meaning of your life … having a sense of belonging … those turn out to be independent predictors of health, "they're probably more important than anything else combined" … in terms of "resilience" factors against life's blows …'.

Sub-theme: patients' inner resources

The most obvious resource is patients themselves: '… in western medicine, there is little attempt to nurture and harness patients' psychological resources …'.[23] Interviewee 11 said: '… people [need] to have more understanding and knowledge about their own care and so give people a different level of power within the system.' Thought leaders envisaged a shift towards mutual responsibility and a more health-literate population with a greater emphasis on professionally guided self-care: giving people more control, more access and assistance with the use of technology. That is, a system which is 'genuinely empowering of individuals and families and friends and communities' (Interviewee 8).

There is growing awareness that genuine patient empowerment will entail a 'profound change in clinical and healthcare cultures and mindsets'. That is, that we need to move towards 'a co-productive culture in which decision-making is genuinely shared between patients and healthcare professionals'.[29] At SouthCentral Foundation, people are not referred to as 'patients' but as 'customer-owners': '… because, as a customer you're treated with respect, and as an owner you take responsibility.' Their system is genuinely 'customer-owner driven' and they have a 'basic philosophy of the person that uses services really knows best' (quotes from Interviewee 12).

In the innovative and successful SHINE community rehabilitation project in Fife, Scotland, rather than undertaking the 'normal assessment' of the patient against a predetermined list of ailments and concerns, staff instead focus on having 'good conversations' with older people. In these meaningful conversations, staff engage with patients in a 'completely different' way: they ask people about what is important to them, and focus on people's inner resources and capacities to support them to achieve their goals.[6]

Sub-theme: peer-to-peer

Another emerging idea cited by interviewees is the use of peer-to-peer support models. These utilize the knowledge, skills and empathy of people with the same or similar conditions.[29] Two thought leaders cited specific examples. Firstly, the internet-based 'EnableMe' for stroke which allows patients to interact with each other and then compare how they want to be treated. Interviewee 15 described a local diabetes prevention programme run by a community organization in which the most successful trainer was a janitor who had himself completed the programme: 'he's a "real guy" and he lost a lot of weight, and there's nothing fancy about this guy, and people trust him…'.

Sub-theme: health workers

There would be new roles for health workers, many existing roles would be used in different ways, and people would be much more likely to work in teams, such as in integrated primary care team medicine. Interviewees also thought that some roles might be merged: 'something that's not quite a doctor, but a bit more of a social worker' (Interviewee 1); that professional roles might actually become more generalized (a reverse of the specialization trend of the past two decades) and that nurses—including nurse specialists and nurse practitioners—would be at the centre of the system. Interviewee 1 said: 'usually what happens … when you get these … paradigm shifts is that completely new roles emerge that you hadn't really imagined …'. Further: 'Probably there's a number of stages of evolution that we'd have to go through … the first step might be to collaborate or work more closely in teams, then maybe the next step is to merge roles … or do something that's even more radically different …'.

In the literature, a recent report by the Primary Care Workforce Commission in England predicts that patients will be seen by new types of professionals (e.g. physician

associates, healthcare assistants), there will be wider use of community pharmacists, that paramedics might substitute for GPs for urgent home visits and that there will be more administrative support for clinical staff (e.g. medical assistants). The authors suggest that 'joined-up IT systems' could facilitate this, with communication by phone, e-mail, electronic messaging and videoconference. They also recommend 24-hour community nursing services and that specialists have direct contact with primary care staff (e.g. routine e-mail and phone advice, multi-disciplinary team meetings, providing referral clinics in primary care settings) to better integrate care.[30]

Sub-theme: community-based health

Interviewees spoke at length about community-based health. Five suggested that we could better utilize existing networks of social and health sector workers, and certainly this is an emerging theme in the literature: '… using these resources in different and coordinated ways and by linking them through technology … Up-skilling these workers and leveraging their existing relationships with communities might facilitate much more community and in-the-home contact.'[31]

As well as using existing workers in different ways, thought leaders argued for a broader definition of healthcare workers to include wider influences on health, such as housing and education. Interviewee 4 cited mental health services using employment consultants and exercise physiologists. Interviewee 15 described the partnering of a healthcare organization in the USA with a community-based non-profit organization of 'promotoras'. Promotoras are lay health workers—'trusted folks' who work with people in their community to support and promote health. 'They're helping people change their nutrition and get physical activity and deal with their substance abuse issues and maybe family matters, legal and financial services … and so in that regard, [it's] really an "extension" of the care delivery system'. The potential of such a 'workforce' is enormous. A recent report by the Royal Society of Public Health says that to address the major public health issues and prioritize prevention of illness, we need to 'engage with the public via wider occupation groups'. Their exploration of community assets estimates that ~20 million people in England could potentially be part of this wider workforce.[32]

Sub-theme: ageing: burden or resource?

In the dialogue around healthcare, ageing is almost always framed as a problem and a burden on society. However, two thought leaders had a different perspective. Interviewee 8 said:

> … the general rhetoric is that as the population ages, healthcare needs will increase and we'll need to somehow have to spend more money … that is just such a false premise! The issue is not the age people die, the issue is the level and complexity and cost of morbidity in the period up until their death.

And;

> … we're talking about [ageing] as if it were a problem, rather than one of the biggest blessings in human history; and we're talking about it as if it's inevitable rather than something that's plastic and amenable to intervention and change; but again, how would the whole population achieve a healthy lifestyle with compression of morbidity without a quite fundamental change in the way we all live.

Interviewees spoke at length about healthy and productive ageing. They described 'compression of morbidity': living a long and healthy life, with death preceded by a very short period of ill health.[5] Their view was that social contact is not only vital to healthy ageing but that as a co-benefit, older people represent a valuable social resource.

In her book, 'Cure: A journey into the science of mind over body', Jo Marchant cites evidence from researchers investigating long-lived communities—'Blue Zones'—around the world.[23] One of these groups, the Nicoyans in Costa Rica, were found—at ages of 100 or more—to be still physically, mentally and socially active and, on testing, had telomeres longer than those of other Costa Ricans.[22] They were also less likely than other Costa Ricans to live alone, and more likely to have weekly contact with a child. The researchers hypothesized that, despite their poverty, the close family ties and social bonds protect the Nicoyans against life stress that would otherwise shorten telomeres.[22] This is consistent with the other unusually strong social networks found in other Blue Zones.[23]

In another project developed by a neuroscientist called 'Experience Corps', elderly adults spend 15 hours each week volunteering in deprived elementary schools, helping kids to read.[33] As a result of the programme, the volunteers' health improved: their activity levels increased,[33] they performed better on cognitive tests, there was increased activity in the prefrontal cortex and their hippocampus got larger. That is, the 'age-related damage in their brains was being reversed'.[23,34] Marchant quotes the study author: 'results like these suggest we should see ageing differently'.[23] These findings provide insights into a future in which health services might be complemented by a myriad of behaviours which maintain function and well-being into

old age. It is consistent with interviewees' opinion that aged care should not be about managing people's decline, but about harnessing their abilities: reframing ageing as 'a time to give back to others'.[23] That is, rethinking ageing as a resource rather than a burden.

Limitations of this study

This study drew on a small sample of leading thinkers from only four countries. It was about generating and exploring their ideas and opinions, and as such does not provide definitive answers to the research questions. Further work will be required to establish appropriate outcome measures, including metrics for the carbon costs, and then to pilot and evaluate the kinds of initiatives discussed. Some early theoretical work in this area is being undertaken which quantifies the potential carbon and monetary savings from a range of initiatives including several approaches related to social value and reducing social isolation.[35] Further work in this area could draw on their methodology.

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