Achieving the integrated and smart health and wellbeing paradigm: A call for policy research and action on governance and business models

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ABSTRACT

To assure sustainability of our health systems and improve quality, implementing integrated wellness, health and social care service models have been proposed. They will need the enabling power of Health ICT facilitated systems and applications. Such solutions support the efficient coordination of service provision across provider and jurisdictional boundaries, the sharing of data, information and knowledge, and the streamlining as well as individualisation of care. Achieving such change in health systems with limited resources requires refocusing the trend of medico-technical progress. Health ICT innovations must be scrutinised for their potential to indeed contribute not only to decreasing costs, but – at the same time – improving the quality of life and ability to cope with challenges like the increasing prevalence of certain chronic diseases or new expectations from healthy people and patients alike.

This paper argues that decision-oriented governance models leading to focused policy interventions are needed at several levels: Governments should provide for comprehensive Health ICT infrastructures to enable provider market success. At the individual actor level, sustainable business models reflecting in their value propositions the expectations of their clients (patients and funders) need to be developed. Health policy should design intelligent reimbursement systems providing incentives to indeed optimise services. Smart health innovations should only be implemented where they help achieve the goal of increasing the productivity of health value chains and the quality of overall service delivery value systems. To assure allocational efficiency, regulatory impact analyses (RIA) can support evidence based policy making.

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1. Preface

Various ideas and policy suggestions discussed in this opinion paper were initially presented at the OECD Workshop on “Building a Smarter Health and Wellness Future” held at USA National Science Foundation premises in Washington, DC, 15–16 February 2011. They address the expected benefits of information and communication technology (ICT) applications for the emerging new models of integrated health and long-term care [1,2], and identify persistent barriers to achieving such smarter models. Improved decision-oriented governance models, provision of Health ICT infrastructures as a public good, intelligent reimbursement regulations assuring reasonable business cases for all actors involved, and supporting policy interventions may all help to overcome such barriers.
2. Improving the benefits from smart health services – what are the challenges?

60 years ago public health visionaries discussed priorities for health policy which sound acutely modern and similar to today’s statements by policy makers and medical experts:

- 1950: “While it is not strictly correct to link the aged with those who are chronically ill in any discussion on the provision of a health service for the community, they may be grouped together because of the fact that special provision has to be made for them. The rising cost of the upkeep of hospital beds is one of the factors which make discussion necessary... Quite naturally one asks for how long the cost of hospital treatment is likely to increase and what will happen in the future... We should realise that prevention of chronic illness is no less important in the community than prevention of the acute variety... The most important of the chronic diseases have been named as heart disease, arterio-sclerosis, arterial hypertension, nervous and mental disease, arthritis, kidney disease, tuberculosis, cancer, diabetes and asthma.” [3]

- 1954: “Comprehensive program, such as those directed to bring maximum benefit to persons with chronic diseases, require the coordination of the efforts of many individuals and agencies... The home care program clearly demonstrates the importance of the close integration of clinical, public health, and other services if the needs of chronic disease patients are to be met to a reasonable degree.” [4]

- 1964: “The road ahead for preventive medicine seems clear. It is the delivery of high quality, personalised (as opposed to depersonalised) comprehensive medical care to all.” [5]

It seems that some health policy and health system discussions have been turning in circles without much progress for more than half of a century. This serves to underpin the urgency of the need for a new health services paradigm both to cope with these still unsolved issues and to meet new challenges from the ageing of our societies, chronic diseases, environmental threats, and others.

On the one hand, the ageing of our societies which causes increased concern is probably not a real health threat. “On the whole, the recent increase in life expectancy has been accompanied by declines in disability and functional limitations at older ages. Over the 20th century as a whole, the rate of improvements in functional limitations has accelerated. At the beginning of the 20th century, older men were less able to walk, bend, see, and hear than men today, and they were much more likely to suffer from respiratory problems, valvular heart disease, arteriosclerosis, and joint and back problems. This generation suffered from severely debilitating infectious disease, chronic malnutrition, and heavy manual labor.” [6] And in addition, as it was nicely put into a single sentence: “The process of deterioration with age is not being slowed over time: it is being delayed.” [7]

Furthermore, “despite perceptions to the contrary, neither the ageing of the population, nor the rise in the incidence of some chronic disease, are principal drivers of cost.” [8–11] Whereas long term social care costs are forecast to continue to moderately increase as our societies age, e.g. in Germany [12], there exists considerable evidence indicating that the bulk of healthcare expenditure for any one individual is incurred during the last year of life, independent of, or even decreasing with, older age [10,13–15]. In Germany, hospital-related healthcare costs are even expected to decline slightly after 2030 as an effect of ageing [12]. The bulk of rapid healthcare cost growth in the past has been driven by rising per capita incomes, the availability of promising but costly new medical technologies, workforce shortages that drive up the unit costs of health care, and the asymmetric distribution of market power in healthcare that gives the supply side of the sector considerable leverage over the demand side [10]. There is little evidence (yet) that present health system policies will successfully deal with and reverse, or at least weaken, such trends.

On the other hand, some chronic diseases like dementia, myocardial infarction, or cancer tend indeed to increase with older age [16], and the prevalence of obesity in all ages and other diseases, which it may cause, are on the rise [17]. Furthermore, childhood chronic diseases are becoming a new challenge [18,19]. The same seems to hold for environmental impacts on health like water and air quality, environmental pollution by hazardous substances and emissions, urbanisation and noise, and climate change [20,21].

3. The vision of a smart health and wellbeing paradigm

How can these and related challenges be met by our health systems, and what contributions should we expect by ICT applications for the emerging new models of health and long-term care? Because of the complex and highly dynamic nature of our health systems, evolutionary steps towards integrated care models, facilitated by cost-saving innovations, may become the preferred way forward.

3.1. Revolution or evolution?

Conceptualising health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” [22], and taking such a perspective seriously, requires our health systems to go beyond merely coping with acute and chronic diseases. What is needed is a much more encompassing and integrative understanding of and approach towards dealing with challenges of wellbeing, health, and long-term as well as social care, which need to acknowledge the determining impact of both nature and nurture – of genomic and family predispositions and heredity, as well as the psychic, social and physical environment and lifestyle.

But how are we going to achieve this? Through the regularly evoked revolution of present-day healthcare? Successful revolutions of health systems are rare, such as the emergence of the Bismarck System – payments for health insurance by both employers and employees – in Germany staying in place since 1883 [23], or the introduction of the Beveridge System, the tax-based National Health Service, in the United Kingdom in 1948 [24]. Today, our national health systems are highly complex, adaptive systems which are awkward to manage. To predict the final outcome of policy interventions has become difficult,
if not often impossible, due to the multiplicity of stakeholders involved, their divergent interests, and the emergent properties of such systems which cannot be foreseen from analysing individual components or singular policy interventions.

3.2. The integrated care vision

Furthermore, today’s health and social care services are usually delivered independently, leading to inefficiencies, duplication of resources or reduced levels of quality of care [25]. Older people are particularly affected by this situation, since they often need both types of services, support with daily living activities and chronic disease management. As a consequence and first step, it seems more efficient and advisable not to call for another revolution with unforeseen results, but rather to allow our health systems to evolve towards a new model of service delivery as described by the notion of Integrated Care to better meet old and new challenges. Integrated care has been defined as “an organisational principle encompassing continuity of care, shared care and seamless care. In integrated care, professionals from different organisations work together in a team-oriented way towards a shared goal, with shared resources to deliver, via an integrated service delivery process, all a person’s care requirements. This requires high-quality collaborative working relationships, clarity and commonality of objectives and care plans, frequent communication among team members, a clear understanding and respect of individual roles and skills within the team, a transparent incentive structure and the general flexibility of practitioners.” [26,27] However, when taking the WHO definition of health at face value and, at the same time, meeting new demands both from policy makers and the public for “physical, mental and social well-being”, this perspective will have to be extended towards an even more complex and encompassing Integrated Wellbeing and Health Services model. This must include a much stronger link across health and social care as complementary support to personal holistic health [28].

It is hoped that this will not only lead to improved health, but also to higher quality of care, patient empowerment and satisfaction when indeed ill, and furthermore to raising the efficiency of social and health systems. But this causes a dialectic tension between resource-intensive care focusing on each individual patient, delivered by dedicated, compassionate doctors and nurses, and streamlined, guideline-conformant providers of services where “patients are no longer patients, but rather ‘customers’ or ‘consumers’,” [29] and where economic optimisation has become declared policy and organisational goals.

3.3. Technical innovations – cost drivers or cost savers?

A second step will be to embrace new technologies more intelligently [30]. We know from experience that technological change has the potential to be positive or disruptive – to either help us to better cope and benefit from it, or to negatively impact on our wellbeing.

But what has fundamentally changed since the middle of the last century? “For the first time the facilitating and enabling capacities of advanced information and communications technology (ICT) indeed allow us to respond to these [health and social care system] requirements favourably. ICT applications, or eHealth, can enable patient data to be safely shared, clinical pathways and service delivery processes to be coordinated, knowledge to be generated from structured data, and results to be merged into an evolving standard of care provided jointly by health and social care services.” [8]

Albeit, in the field of healthcare, the biggest single cost driver so far has been technical-medical progress: “Roughly half of the increase in health care spending during the past several decades was associated with the expanded capabilities of medicine brought about by technological advances.” [31] In other words, progress has often been focused on extending and expanding medical procedures and interventions, and less on increasing the efficiency and productivity of the health value system, or the complementary well-being support which will ameliorate health needs and thus health expenditure.

In future, achieving change in a system with limited resources will require focusing on cost-saving and productivity-increasing technologies; this is becoming the grand challenge for the sustainability of our wellbeing and health systems. In the aftermath of the global economic crisis, it is to be expected that new technological and socio-technical developments and applications like “new high-speed and mobile applications, connected devices, social networks, and related cutting-edge smart technological developments” [32] will be scrutinised much more for their financial and socio-economic benefits and costs [33]. These technological developments promise to deliver innovative ways of meeting patients’ and society’s needs for care and support in the context of health systems that are committed to the provision of high-quality care, but have limited resources. As such new technological solutions are being developed in parallel to the diffusion of integrated healthcare models, which also require new ways of organising processes and interventions, not only their medical impacts need to be scrutinised, but also social, ethical, and economic implications of the development, diffusion, and integrated use of these innovations.

4. Integrated care models, change to socio-technical systems, and innovative approaches for benefits realisation

4.1. Achieving the global vision

But what plausible benefits may indeed be expected from such a smarter health and wellness future? As the vision of the OECD Washington workshop articulated, “new high-speed and mobile applications, connected devices, social networks, and related cutting-edge smart technological developments can provide unique and unprecedented opportunities for engaging patients in their own health, health care, and in clinical research, and for connecting informal and formal caregivers, health professionals and researchers stimulating collaboration and innovation on a global scale.” [34]

It was pointed out that to achieve this vision improved ICT infrastructures and new business models are as
essential as new software functionalities. We must gain a better understanding of how these developments provide for an environment and services that can help address the health and disability challenges of our ageing society, and how they are driving innovation at different levels of our healthcare value systems. This concerns not simply “an exercise in technical system delivery, but ... a larger process of sociotechnical systems change.” [35] We need to analyse the extent and form of social and organisational innovation, and of the new business models that go with them, and their likely impacts. Governments, as integral part of their governance models, will have to accept a strong leadership role in shaping policies and implementation programmes to make the most of the benefits of these developments for both individuals and society, and reflect the relative roles of technical, social, and organisational innovation in driving and enabling these developments.

Only then will it become possible to reap the benefits expected from integrated service delivery, where a wide variety of service providers closely collaborate in a holistic health value system, while each of them has to manage their own value chain, including connections and complementarities with the value chains of their partners and collaborators [36]. Together they ‘produce’ and sustain wellness and health both of individual clients and populations by providing for a healthy environment, promoting healthy lifestyles and good health, supporting disease prevention, undertaking diagnostic and therapeutic interventions, delivering healthcare, rehabilitation and long-term care services.

Today, most industrial or service sector organisations would no longer be competitive without connections to global communications networks and making use of advanced software tools and ICT applications. Similarly, it seems plausible, even indispensable, that future health system models will need a ‘smart’ element, based on a complex, dynamic ecosystem of interrelated ICT process tools and application services to interconnect health delivery processes.

4.2 Barriers to success

However, it seems national and regional health systems are faced with more persistent barriers to achieving the envisaged Smarter Health and Wellness Model than other sectors of society when investing in eBusiness models, for example. This seems to be partially to do with the fact that the healthcare market is different from other markets with respect to choosing and competing for customers, referral relationships, flow of funds, negotiating prices, regulations, etc. [37]. Secondly, it has to accommodate all needs of all patients and citizens, whichever supplier they choose, making more akin to air traffic control than to an individual airline with its specific but (largely self-selected population of customers and suppliers). As a corollary, in health systems the costs of re-engineering delivery processes and of related organisational change are often borne by different organisations and professionals from those who will benefit in terms of greater economic efficiency and better quality. This is close to a set-piece guarantee of permanently impeded progress, as there is no incentive for those in the key position to innovate, and no lever for the potential beneficiaries. Furthermore, regional and national parliaments, governments, and other health policy actors such as insurance companies are too intent on prescribing generic principles and the operational applications under this, when what is needed is a policy and rewards framework to encourage individual organisations and professionals to modernise.

4.3 Assuring decision-oriented governance

To overcome such barriers, governance models leading to focused policy interventions are needed. Depending on context and purpose, there are many different types and definitions of governance. The International Organization for Standardization (ISO) has defined governance as “the collective set of procedures, policies, roles and responsibilities, and organisational structures required to support an effective decision-making process” [38]. Providing for such a goal and decision-oriented governance model is a “critical, if not the most critical, aspect in the transition process from conventional healthcare to eHealth-enhanced healthcare systems and services.” [39] Such a framework seeks mandatory to assure the focused and timely identification of well-designed actions needed at several levels to realise the vision of a smart health and wellbeing paradigm.

4.4 Investing in health ICT infrastructures – a public good perspective

A central issue is: How can we overcome the barriers identified and make faster progress in achieving the "Smarter Health and Wellness Future"? As a first step, when considering the substantial further investments needed, it is important to differentiate between, on the one hand, establishing a regional or national eHealth infrastructure and, on the other hand, investments to be undertaken at the respective organisation or provider level.

When even in a major innovative economy it is realised that “despite this great promise, the impact of IT on healthcare over the past decade has so far been modest” [40], it seems obvious that to allow for the ubiquitous but secure access to and exchange of personal data and other information across healthcare providers and jurisdictional boundaries an all-embracing Health ICT infrastructure is indispensable [41]. This concerns not just the technical vehicles, but issues and elements like governance rules and processes, competence centres and supporting organisational structures, secure and unique identification of patients, health professionals and service provider entities, security and data privacy, regulation of technical and semantic standards, and payment/reimbursement issues.

Such an environment will allow for a network effect to kick in, known as user externality or demand-side economies of scale, where the more people who use a network, the greater is the value to each of them. When such a network effect is present, the value of a product or service increases as more people use it [42]. Unless it is a regional or national health authority, individual service providers usually do not have an incentive to establish such an infrastructure, i.e. we have a market failure situation where this public good problem can only be solved by government intervention, a union of health service providers, or a group of Third Party Payers.
However, whether public money should be spent on such an infrastructure – or on alternative spending options – is not necessarily obvious, particularly in free market economies, and a rigorous approach to assess the foreseen benefits and costs is befitting. This should apply also to evaluating whether and under what framework conditions the same or similar results may be obtained by private investors establishing the desired infrastructure, or whether alternative regulatory interventions not including spending of public funds may suffice.

Switzerland has officially subscribed to undertaking such a Regulatory Impact Analysis (RIA) of its draft eHealth legislation [43] – including the option of what can be expected to happen without public funding intervention, the results of which were discussed at the parliamentary level and provided decisive input for finalising the law. RIA is a systemic approach to critically assessing the positive and negative effects (benefits, costs, incentives and risks) of proposed or existing regulations and their non-regulatory alternatives [44]. As employed in OECD countries since 1974, RIA encompasses a range of methods based on benefit-cost analysis. At its core, this is an important element of an evidence-based approach to policy making.

However, governments and health system administrations in larger countries or regions need to be aware that evidence indicates that there may be a size limit to such endeavours, particularly when attempting to combine it with one-size-fits-all applications. Various European regions and countries like, e.g., Andalucía in Spain, Kronoberg in Sweden, Lombardy in Italy, or Denmark, Estonia and Scotland have already mastered or are at an advanced stage of implementing such infrastructures – including Electronic Health Record (EHR)-like systems covering emergency care summary data only or up to complete patient records, sometimes including regional or national ePrescription transfer systems [33]. But larger countries like Canada, France, Germany, or the USA all are struggling, up to 15 years now, to establish such infrastructures, albeit without final success [45].

Concerning the strategy behind such activities, the top-down approach of many national programmes for Health ICT may be at the heart of their problems. Restricting such programmes to core infrastructure components and standards to ensure interoperability, and combining them with a more decentralised strategy allowing for regional diversity, choice of applications and competition, combined with a “middle-out approach”, which goes some distance toward bringing closer the needs of health providers, the IT industry, and government, by creating a common set of technical goals and underpinning standards that can sit between them” is probably the more promising route to follow [46]. The clinical need for large-scale, sophisticated national applications is being questioned, as a recent English evaluation noted: “Clinicians’ enthusiasm for electronic health records often related to perceived benefits on their immediate surroundings and did not necessarily relate to the NHS Care Records Service goal of geographically widespread sharing of patient data.” [47]

4.5. Developing sustainable business models

At the individual level, a clear business case is needed to render health ICT implementations sustainable. For private, and even more so for public sector actors, both a well-developed business model and a related business plan for its realisation are key success factors. However, delivering on a value-proposition that indeed meets the expectations and needs of the direct client such as patients or nurses and of indirect clients such as Third Party Payers, and also assuring a win-win situation for various stakeholders at the same time (like professionals, organisations, payers, society at large) has proven very difficult, if not elusive. Next to non-existing or underdeveloped Health ICT infrastructures this is a major barrier to the overall success of such eHealth systems and solutions [48].

A business model is a conceptual tool that contains a set of elements and their potential relationships needed to deliver on a product or a service that provides added value to customers. In a concrete case it reflects the business logic of a specific undertaking [49]. To realise the model, a strategy for implementing it during the initial years and a business plan are needed; forecasts of the (new) market, of assets and man-power required, operational structures and processes, sales and expected benefits/profit for a set of options are indispensable. Furthermore to secure funds to realise the plan, a cash-flow analysis – or, particularly in the public sector, a more comprehensive socio-economic benefit-cost analysis – will be essential, combined with an affordability analysis of how to cover the investment from the available public budget. To reap common good-type benefits from Health ICT applications, all too often individual health organisations are expected to fund a finance-requiring solution in their business domain in order to enable wider economic efficiency and social gains in other organisations and society at large, without compensatory mechanism – a situation which is unsustainable and will not lead to success.

Such models also need to include finding common ground among all those organisations and care providers which cooperatively deliver integrated services. It seems that wellbeing and health sector actors still have to better understand and respond to the needs of their potential clients, and policy makers need to set the right incentives and regulations.

On the supply side, organisational, cross-jurisdictional as well as professional and business conflicts will arise, which all stakeholders have to learn how to better facilitate and mitigate. Public actors will have to eliminate legal, organisational, and sometimes also competition barriers between diverse service providers which often still hinder the delivery of truly integrated care. The path between choice and avoidance of monopoly on the one hand, and damaging fragmentation on the other hand, is a narrow one.

Many innovative ICT-facilitated health services are not taking off as expected [50]. A likely cause is that evidence on their anticipated benefits is not convincing and proven, and unless all actors involved in cooperatively delivering the respective health service see a clear and realistic benefit for themselves, such innovations will not scale and diffuse across health systems. Medical professionals, patients, healthcare providers, payers, industry, telecoms – all need a well-articulated portfolio of proven (not hypothetical) benefits and a sustainable, financially sound business case.

Policy makers need a better understanding of the factors impacting on such decision being taken by health system
actors, and instigate the development of a governance model and policy measures supporting the faster diffusion of eHealth innovations, thereby helping to transform eHealth ‘adventures’ into sustainable ventures with an attractive return on investment.

4.6. The need for intelligent incentives

Further governance challenges concern issues around administrative responsibility, stakeholder engagement, legal and regulatory facilitators, and – in particular – financing and reimbursement issues. To diminish the often very real tension between those who will pay for and those who will benefit from such new service models, intelligent incentive approaches are needed, particularly when costs and savings are spread unequally across organisations. Whereas, e.g., the individual patient, the payer or society may win, professionals or those whose services become substituted may lose. Particularly physicians may, when they are among the losers, constitute so-called “veto-players” who, due to their professional power, can block otherwise meaningful developments entirely. Similarly, organisations operating on a balanced budget basis cannot carry the costs of systems which provide social gain (including the notional savings of avoided morbidity) unless they are reimbursed for this.

This will require in many countries new, creative reimbursement systems not based on fee-for-service regimes which focus on volume, but rather on build-in incentives for outcome and prevention-oriented healthcare like Managed Care models, the benefits of which must also filter through to those providing the enabling ICT systems. In discussions on the quality of care the importance of professional ethos, motivation, adequate staffing levels and training are often stressed. Although these factors are very important, they seem to have a limited ability to change behaviours. However motivated these stakeholders may be to use innovative care models, few will operate against their economic interests or financial viability.

Health policy must critically assess how financial flows in wellness, health and welfare systems and non-financial attributes, like loss or gain of esteem and power, provide incentives or disincentives for offering health services facilitated by Health ICT. E.g., it is to be expected that well-structured and calibrated capitation or salary based systems with stringent quality control provide built-in incentives to optimise services, which would induce making use of eHealth solutions only where they help achieve the goal of increasing the economic efficiency and productivity of health value chains and/or the quality of the overall service delivery system. On the other hand, fee-for-service approaches may lead to higher costs when applications require a specific, additional reimbursement payment which is not compensated for by a reduction in other fees. Nevertheless, during an initial diffusion phase, it may be politically justified to provide an ‘extra’ monetary incentive to speed up innovations and reach a critical implementation mass swiftly. However, one has to acknowledge that surprisingly little evidence is available on how capitation, salary, fee-for-service and mixed systems of payment affect the behaviour of primary care and other physicians, and those “findings' generalisability is unknown,” thereby identifying a research field in urgent need of attention.

4.7. Enabling patient choice while controlling supply

A closely related point is the importance – and effects – of patient choice when introducing a new model of integrated care. Clearly, limited resources by necessity will always put a ceiling on patient choice and treatment options to be considered; even when public debates on rationing of health services are neither popular nor well developed.

Not every chronic patient can be expected to be interested in the long-term continuous monitoring of vital, behavioural and lifestyle parameters. And some patients may rather opt for services which meet their individual needs with respect to an easier, happier, more fulfilling life, respecting their psychosocial preferences and cultures, even if the health outcomes as such are not the best ones achievable, or the cost savings expected cannot be realised. Exploring the options for modifying, coordinating, and better controlling the supply and usage of (public) health and care resources from the funder perspective is a key perspective also needing attention, which may trigger a dialectic tension with the often voiced policy priority of supporting patient choice.

On the other hand, older chronically ill persons often need both types of services, support with daily living activities and chronic disease management. Here ICT-based solutions are expected to be of great benefit by supporting integrated service delivery, thereby e.g. allowing for avoiding unnecessary parallel resource consumption while at the same time achieving higher quality of life through more independent living and wellbeing.

5. Policy action needed

Although some of the challenges our health systems are confronted with are known for 50 years and more, how to best deal with them is less well understood. The smart health and wellbeing paradigm exploiting the new opportunity of ICT enablement has been proposed as a way forward, leading to new models of providing integrated, seamless wellness, health, and social care services, facilitated by Health ICT systems and solutions. As in other economic sectors, such applications will become indispensable for optimising planning, organising, coordinating and controlling service provision within health and social care provider organisations as well as for efficient collaboration across organisations and jurisdictional boundaries, and sharing of data, information and knowledge. This new smart care system is expected to help assure both higher service quality than offered by today’s often still cottage-type industry approach and also assure long-term sustainability in the face of economic and demographic change, thereby meeting the triple aim of “improving the experience of care, improving the health of populations, and reducing per capita costs of health care”.

However, to be achieved effectively, policy action is necessary on a variety of issues and barriers identified in this paper, even though due to a scarcity of research and experience the optimal individual solutions are not yet always clear. Often
little is known about the effectiveness of certain health policy interventions, their unintended effects, impacts on equity, quality and accessibility, and issues like cost, feasibility, and acceptability in the respective context where their implementation is considered [59].

New or improved decision-oriented governance models are perhaps the most critical aspect in the transition process from conventional to ICT enabled healthcare systems and services. A well designed governance framework should be regarded as mandatory to assure the focused and timely identification, planning, and implementation of actions needed at several levels to realise the vision of a smart health and wellbeing paradigm.

At the health system level, governments should consider investing in comprehensive Health ICT infrastructures, with related governance, as a public good and thereby avert market failure in this field.

At the individual actor level, sustainable business models reflecting in their value propositions the needs and expectations of their final clients must be developed. They should be able to cope with the barrier that in health systems the costs of change are often borne by different organisations and professionals from those who will benefit in terms of greater economic efficiency and better quality.

To complement this, a rewards framework encouraging individual organisations and professionals to modernise seems indispensable. Health policy should design effective reward and reimbursement systems providing intelligent incentives to indeed optimise services, like well-structured and calibrated capitation or salary based systems fostering outcome, quality, safety, and prevention – and not volume of services.

Achieving change in a system with limited resources also requires reversing the trend of cost-increasing medico-technical progress towards prioritising cost-saving and productivity increasing technologies – a grand challenge for the sustainability of our health systems. All smart health innovations should be scrutinised for their potential to indeed contribute to not only decreasing the cost of service, but also to improve the quality of life for all.

To assure allocational efficiency of public investments, ex ante regulatory impact analysis (RIA) and ex post socioeconomic benefit-cost evaluation approaches can support evidence-informed policy making.

In addition, it is essential that Health ICT developments and implementations are guided and driven by national and/or regional health policy priorities and concrete objectives derived there from. They must meet the needs of stakeholders, like patients and professionals, and focus on expected benefits, avoiding a technology-push approach. The critical success factor will be creating sound economic and governance frameworks which reward this without related perverse effects.

Finally, to support evidence-informed and explanation-based policy making, a better data base and an improved understanding of underlying causal relationships are indispensible. Since “the production of knowledge syntheses on public policies is still a relatively uncharted area of endeavour”, further research on the policy options and measures discussed, including the respective context in which implementation of a policy is being considered, as well as a deeper

Summary points
What was known before the study

- The sustainability of our health systems is endangered, supposedly particularly by the ageing of our societies and the spreading of chronic diseases.
- To cope with this challenge, we will need eHealth solutions which facilitate the efficient coordination of service provision across jurisdictional boundaries and the sharing of data, information, and knowledge to improve coordinated, seamless and integrated care.
- Today’s health systems quite often still use a cottage-type industry approach.

What this study has added to the body of knowledge

- It is suggested that a new model of providing integrated wellness, health and social care services to all has become mandatory.
- It will need the enabling power of knowledge based clinical process management platforms.
- Achieving such change in a system with limited resources requires refocusing the trend of medico-technical progress on prioritising cost-saving and productivity increasing technologies – the grand challenge for the sustainability of our systems – and not so much on age-related and chronic disease focused challenges as such.
- eHealth innovations must be scrutinised for their potential to indeed contribute to not only decreasing costs, but – at the same time – improve the quality of life and coping with challenges like the increasing prevalence of certain chronic diseases or new expectations from healthy people and patients alike.
- Policy interventions and actions are needed at several levels: (1) Governments must provide for comprehensive eHealth infrastructures as a public good to meet market failure in this field. (2) To assure allocational efficiency of public investments, regulatory impact analyses (RIA) and socio-economic benefit cost assessments must be undertaken to support evidence based policy making. (3) At the individual actor level, sustainable business models, which fully reflect in their value propositions the needs and expectations of their clients, must necessarily be developed and used. (4) Health policy needs to develop intelligent incentive and reimbursement systems, like well-structured and calibrated capitation or salary based systems, to provide built-in incentives to optimise services, thereby promoting. (5) Use of smart solutions only where they help achieve the goal of increasing the productivity of health value chains and the quality of overall service delivery value systems.
analysis of concrete experience in different settings are in urgent need, all guided by a well-designed analytical framework [59].

Author contributions

There is only one author contributing.

Conflict of interest

None declared.

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References


[34] Draft “Scope and Objectives” of United States National Science Foundation hosted OECD Workshop on “Building a Smarter Health and Wellness Future” held in Washington, DC, United States, 15–16 February, 2011.


[40] Executive Office of the President – President’s Council of Advisors on Science and Technology, Realising the Full Potential of Health Information Technology to Improve Healthcare for Americans: The Path Forward, Washington, DC, USA, 2010, December.


