Healthcare Industry 2013

Sustainable Health Systems

Visions, Strategies, Critical Uncertainties and Scenarios

A report from the World Economic Forum
Prepared in collaboration with McKinsey & Company

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Preface

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The World Economic Forum has made health a priority global initiative, recognizing it as central to the Forum's overall mission to improve the state of the world.

Looking at health as a fundamental economic issue, the Forum aims to address two major gaps-access to health and access to care - making health and care an investment for economic development and growth.

We believe the current economic crisis represents a welcome opportunity to design our health systems for the future. The context for health is rapidly changing; increasingly in advanced economies, healthcare systems are deemed financially unsustainable, while in emerging economies, they are still being shaped.

The purpose of the project – and this report – is to support strategic dialogue among various stakeholders on what health systems are now, what they might be in the future and how they could adapt to be sustainable.

Sustainability is unlikely to be achieved through incremental changes. Instead, transformative solutions will be needed – solutions that require cooperation across industry sectors and governments, and thereby challenge the current boundaries of healthcare and established norms of operation.

In this context, the World Economic Forum has provided a neutral platform for more than 200 stakeholders and experts from governments, industry and civil society to explore the question: what might health systems look like in 2040?

Supported by the Forum's Strategic Foresight methods, the project has facilitated discussions about how health systems could be organized in the future. Scenarios were developed to demonstrate that radically different health systems are imaginable, to explore boundaries of health systems and the roles of different actors, and to provide a framework for interpreting future contextual developments that might affect health systems.

We also conducted country workshops in China, Germany, the Netherlands, Spain and England to support public and private actors in starting national conversations about transforming their health systems. In these interactions, stakeholders articulated elements of a vision for their countries' health systems and explored top-line strategies to achieve those desired futures.

We hope policy-makers and business leaders find this report relevant and useful and that the process of developing scenarios, visions and strategies is a good catalyst for future discussions and the development of collaborative solutions for sustainable health systems.

Executive Summary

Achievements and advances in health and healthcare are a major success story of the past two centuries. However, this success has come at a cost, with healthcare expenditure outstripping GDP growth for decades across the Organisation for Economic Co-operation and Development (OECD) countries. Given the main reasons for rising health expenditures, it is unlikely that focusing solely on improving healthcare supply efficiencies will lead to sustainable health systems in the future. Instead, societies must look outside the traditional institutions, processes and people, known today as the healthcare system, to a broader emerging *health system* that this report proposes.

In today's economic climate, many governments are targeting healthcare expenditure for cost-cutting as part of broader austerity programs. A discussion on long-term sustainability therefore is timely to ensure that short-term priorities do not damage long-term value. Health system leaders need to think for the future, expanding the group of responsible stakeholders and breaking from the status quo to deliver high quality, full-access, affordable, sustainable health services.

Over the past year, the World Economic Forum, in collaboration with its Partners and McKinsey & Company, engaged over 200 health system leaders, policy-makers and experts in an ambitious global effort to provide a long-term and holistic analysis of sustainable health systems. The central question: what could health systems look like in 2040?

Looking to the future helps to improve the decision-making of today. A longer-term perspective provides an intellectual space devoid of current constraints, vested interests or immediate concerns, and enables us to focus on what really matters. Focusing 30 years ahead, the important trumps the urgent.

Participants used a set of complementary methods, including visions, strategies, critical uncertainties and scenarios. This report presents the thoughts of leading experts and decision-makers on the future of health systems, highlighting the learning and key messages derived. The aim is to equip policy-makers and business leaders around the world with tools, processes and insights to drive the discussion in their own organizations and countries.

Visions

A diverse group of health system leaders across five countries was asked to describe their ideal health system in 2040. Their visions are remarkable in their consistency. The preferred health system of the future is strikingly different from the national healthcare systems of today, with empowered patients, more diverse delivery models, new roles and stakeholders, incentives and norms. The country workshops revealed common themes across system archetypes and national borders: creating a financially sustainable health system requires a major re-orientation towards value and outcomes, the involvement of a broader set of stakeholders in a more effective governance structure, and greater engagement and responsibility of patients and citizens.

Strategies

With the visions in mind, participants suggested strategic options to achieve those aspirations. From the conversations, three major themes emerged:

– Embrace data and information to transform health and care. We are entering the age of precision medicine, fundamentally challenging the past practice of medicine. Improved data and information are beginning to change the way that health systems operate and make decisions, a transformation that can be enabled by faster and more productive adoption and integration of these data

– Innovate healthcare delivery. While the boundaries of medicine exist at the limits of science, the healthcare delivery model is firmly stuck in the past. Health systems can rise to the challenge of a 21st century disease mix, breaking the traditional delivery mould and creating space and opportunity for innovation to deliver better professionals, better outcomes and better value

– Build healthy cities and countries of the future. To achieve a sustainable health system for the future, societies must reshape demand for health services, reducing the disease burden by helping people to stay healthy and empowering them to manage their health. Health systems can encourage people to develop healthier habits, incentivize healthier consumption and develop an environment and infrastructure that facilitate population health

Critical uncertainties

Future health systems will be influenced by a number of factors outside the control of health system leaders. Through over 100 interviews and workshops, six critical uncertainties that might significantly reshape the context in which health systems form and operate were identified:

– Attitudes towards solidarity: Will solidarity – the willingness of individuals to share the population's health risks – increase, decrease or be conditional upon certain factors?

– Origins of governance: Will power and authority be predominantly located at the national, supranational or local level?

– Organization of the health innovation system: Will innovation come from within or outside the existing system? What will be the level of funding? What will be the types of innovation produced?

– Access to health information: Who will take responsibility for collecting and analysing health data? Will people give their consent for their personal data to be used?

– Influence over lifestyles: To what degree will active influence over individual lifestyles be accepted and implemented?

– Health culture: Will healthy living be a minority choice, a civic duty or an aspiration?

Scenarios

As the critical uncertainties demonstrate, health systems very different from those of today are highly plausible in the future. It will be important for policy-makers and industry leaders to be mindful of this when reflecting on strategies.

Scenarios are not forecasts or preferences, but plausible stories about the future. They depict relevant and divergent possibilities, providing a rich context for improving decision-making in the present.

Three scenarios were developed: Health Incorporated, New Social Contract and Super-empowered Individuals. The scenarios provided a key insight – efficiency gains are necessary to move health systems towards greater sustainability, but are insufficient alone.

In Health Incorporated, the boundaries of the health industry are redefined. Corporations provide new products and services as markets liberalize, governments cut back on public services and a new sense of conditional solidarity emerges.

In New Social Contract, governments are responsible for driving health system efficiency and for regulating organizations and individuals to pursue healthy living.

In Super-empowered Individuals, citizens use an array of products and services to manage their own health. Meanwhile, corporations compete for this lucrative market and governments try to address the consequences.
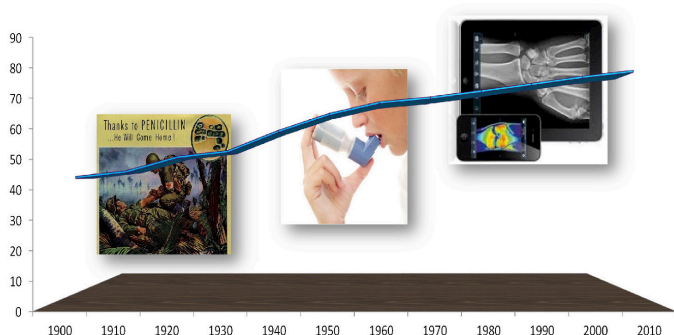
Rethinking Health Systems

Achievements and advances in health and healthcare are a major success story of the past two centuries. People live longer and healthier. Life expectancy has improved worldwide in the past 200 years (see Figure 1) through a better understanding of health and disease, coupled with rising material prosperity and social stability.

However, these successes have revealed new and costly challenges. Treatment and prevention of infectious diseases has led to longer lives and higher rates of chronic illnesses, requiring long-term treatment and care. Healthcare costs have increased sharply, with the incremental benefits of this spending becoming increasingly hard to realize. Over the past 50 years, total healthcare expenditure in OECD countries has climbed faster than GDP, at an average annual rate of 2%. With no reforms under way that would affect the fundamental drivers of healthcare expenditure (see Box 1), some estimates suggest that by 2040 total expenditure could grow by another 50-100% (see Figure 2).
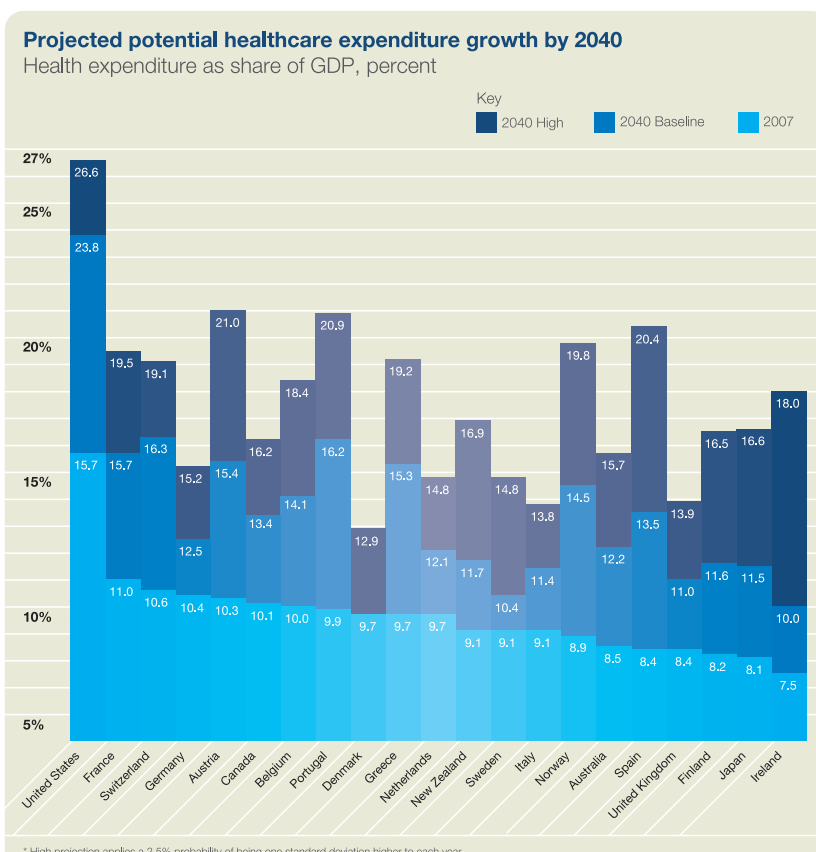
To design more sustainable health systems, advantage must be taken of demand-side opportunities. When people think of health, they tend to think narrowly about treatment and care delivered by a healthcare system rather than broadly about a health system that includes policies, products and services aimed at disease prevention and well-being (see Box 2). The shift from *healthcare to health systems* aims to answer society's calls for better health services while easing the overwhelming demand for care.[1]

Much of the current debate on the future of health is characterized by short-term and siloed thinking and entrenched positions. A short-term view encourages solutions that deliver immediate results and discourages conversations about more fundamental changes that might only bear fruit in the long term. A lack of cross-stakeholder dialogue constrains the finding of solutions outside the traditional approaches to healthcare. There is a need to bridge the gaps between supply and demand, population health and individual healthcare, and healthcare and other related industries. Achieving tangible widespread change requires a coordinated approach that encompasses a broader diversity of actors from across and beyond the health sector.

[1] See also the *World Economic Forum's Healthy Living Initiative*.

Figure 1: Increase in Global Life Expectancy

Source: Health Data 2012, OECD

Life expectancy in EU-5 and U.S.
Years

Figure 2: Projections of GDP Share of Health in OECD Countries

Source: World Economic Forum 2012.

Projected potential healthcare expenditure growth by 2040
Health expenditure as share of GDP, percent

Key: 2040 High | 2040 Baseline | 2007

* High projection applies a 2.5% probability of being one standard deviation higher to each year

The World Economic Forum provided a long-term, holistic debate on sustainable health systems, open to many stakeholders.[2] The Forum brought together over 200 stakeholders to focus on the question: what could health systems look like in 2040? A long-term perspective provides an opportunity to explore fundamental changes, with the objective of strengthening current decision-making. The Forum convened a multistakeholder dialogue, drawing participants from: industries such as food and beverage, information and communication technology, and urban planning; government ministries of health, finance, education, and the environment; and academia and civil society (see Acknowledgements).

As part of this dialogue, the World Economic Forum organized workshops at global and national levels. The Forum facilitated high-level conversations in five countries – China, Germany Netherlands, Spain and England – to discuss the transformation of their healthcare systems to future health systems. In these interactions, stakeholders discussed elements of a shared vision for their countries' health systems, and developed a set of strategic directions for moving towards that vision. These global conversations allowed for a wider exploration of possible future health systems and presented a unique opportunity to learn across countries.

This project used four key complementary methods for thinking about the future in a structured way: critical uncertainties, scenarios, visions and strategies.

Visions. Health systems are complex, with a wide range of stakeholders and priorities. Aligning around mutual goals is rare, but fundamental to long-term transformation. Visions provide an opportunity for health system leaders to explore their ideal long-term futures and find common ground among diverse stakeholders, thereby building consensus and a momentum towards change.

[2] See Annex 1 for an overview of the process and stakeholder engagement.
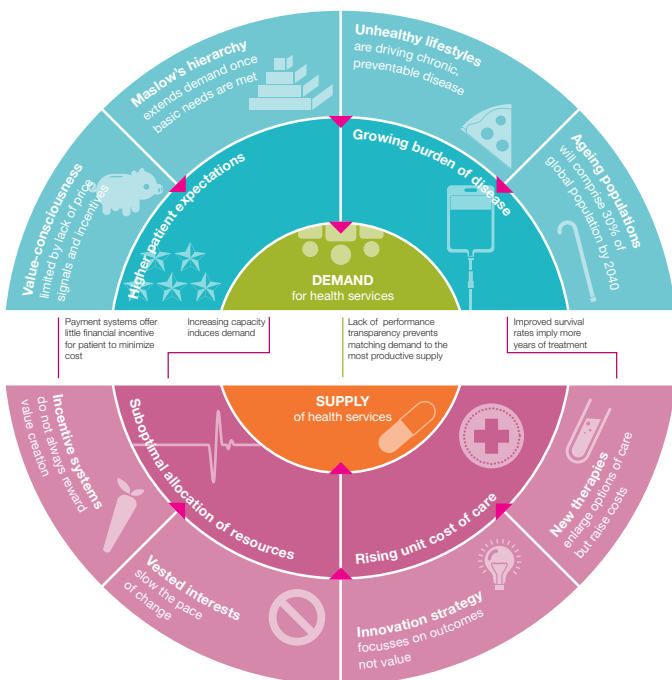
Strategies. By envisioning an ideal, health system leaders can propose strategies to attain it. Strategic options help stakeholders to explore their role in moving health systems forward. This long-term perspective allows a focus on important, rather than urgent, priorities.

Critical uncertainties. Several factors outside the control of health system leaders influence the future of health systems. Exploring these critical uncertainties allowed participants to gain a better understanding of the elements that might significantly reshape the context in which future health systems form and operate.

Scenarios. Health systems can be very different in the future. Creating scenarios enables a rethinking of the structure and boundaries of existing healthcare systems, as well as the nature and role of stakeholders in the pursuit of sustainable health systems. By combining extreme outcomes of the critical uncertainties, a set of scenarios was developed not only to demonstrate that future health systems might be significantly different from those of today, but also to empower policy-makers and business leaders with the insights obtained.

Overall, an iterative process was used in this project, incorporating critical uncertainties, scenarios, visions and strategies as different ways of thinking about the future. Critical uncertainties and scenarios enabled stakeholders to consider a broader set of possible challenges and opportunities that could play out in the future. These insights were used to broaden visions and strengthen strategies for developing sustainable health systems. In turn, visions and strategies tested the plausibility and relevance of the scenarios. This complementary approach enriched the strategic ideas and insights gleaned.

In the next sections, the key thoughts that emerged from the strategic multistakeholder dialogue are discussed.

Box 1: Key Drivers and Dynamics of Rising Healthcare Expenditure

Last year, the Forum explored the fundamental influences on healthcare expenditure, creating a simple conceptual model of demand and supply elements.

Growing demand for healthcare is driven primarily by four factors: an ageing population, an explosion of so-called lifestyle diseases, a rise in public expectations, and a lack of value-consciousness among healthcare consumers.

On the supply side, the cost of care continues to rise, while resources are not allocated in the best way. The rise in unit costs is driven by the advent of new therapies and technologies, together with innovative strategies that focus on better outcomes rather than lower costs. This is compounded by poor allocation of resources in a healthcare delivery system often closed to change (because of vested interests), and an incentive structure that does not always reward value creation.

Ineffective feedback loops between supply and demand forces in health systems are caused by both lack of transparency regarding the value of services provided, and lack of incentives to act on these data even where they are available.

Visions to 2040

The Forum held workshops in five countries, bringing together local stakeholders to explore national visions for sustainable health systems in 2040.

In the workshops, participants addressed the question: what is your vision of your nation's ideal health system in 2040?

Developing these visions allowed stakeholders to discuss aspirations for the future, setting aside current constraints. The process also enabled them to start developing common ground around their desired national health systems. Such diverse multistakeholder discussions begin to build a cross-disciplinary community, which is vital to spur action towards transformation and foster commitment.

The consistency of ambition and aspiration articulated in each country's vision is remarkable. It indicates a dramatic departure from the traditional national healthcare systems of today. At the heart of the ambition for change is a new relationship between individual and health provider. Individual empowerment takes two distinct forms: patients have greater control over the treatment and management of their conditions, and they take greater responsibility to make lifestyle choices that reduce their burden on the healthcare system. The workshop participants recognized that the challenge lies in identifying the decisions and responsibilities a patient can reasonably adopt without compromising population health risk management.

Beyond greater patient responsibilities, the 2040 visions unanimously see greater accountability on the part of a wider set of government and industry actors to deliver effective, sustainable health services. The visions rely on the technology, telecommunications, media, financial services and education sectors to support and deliver elements of future health services.

The reality is that responsibility for health at national level is diffuse, and one single stakeholder cannot be fully responsible. We must embrace this truth rather than resist it. Such diffusion may need to rely on market forces or proactive government intervention to ensure delivery.

The importance of these forces of change is reflected in a consistent call for data collection and for communication to shed light on value creation and varying outcomes within each nation's healthcare system. This is critical to improve both affordability and outcomes of treatment, as transparency helps patients to select the best services, prompts health professionals to improve - and enables payors to make intelligent purchasing decisions.

Workshop participants reported three main observations:

First, looking ahead to 2040 infused excitement, optimism and a longer-term perspective into what is typically an immediate, constrained and highly scrutinized process. (Indeed, Standard & Poor's in January 2012 announced that it would take into account in its national credit ratings the financial sustainability of a nation's healthcare system.[4])

Second, participants were struck by the degree of consensus on long-term goals for their future health systems, even though there were differing views on the best path to take.

Third, there was a sense that a new community had been conceived, dedicated to addressing longstanding challenges and keen to continue to collaborate. Enthusiasm, unity and a sense of community define the driving power of the process behind this report.

[4] Press release, 31 January 2012.

Note: The outcomes of this process – visions and strategies, and their synthesis – reflect the opinions and insights of the majority of the participants in the project's workshops and interviews.

Vision of China's Health System in 2040

In 2040, ours will be a healthy and harmonious society. Our health system will focus on securing good health at a reasonable cost for all, from the greatest cities to the smallest counties and villages. Strong families, vibrant communities and committed employers will work together to improve the health of our citizens. Our government will drive our health and prosperity, taking on the responsibility to secure access to quality care for each citizen, and to cover, at a minimum, any catastrophic illness. The private sector will secure higher-end care and facilities, while offering insurance schemes to finance these new and competitive options.

Learning from the mistakes of others, we will focus on the top ten chronic diseases. We will seek better care earlier to prevent the worst consequences of chronic diseases. Our traditional remedies will be combined with the latest advances in therapies and treatments to ensure that our citizens benefit from a full range of what is possible.

The health system will have the right information and infrastructure to unleash this revolution in preventative population health. In schools across the country, health literacy will be taught to a common health curriculum. Personal health counsellors will help individuals and families to stay healthy throughout their lives and make the best of the health system.

Vision of Germany's Health System in 2040

In 2040, we will be famous for the quality and efficiency of our healthcare. Just as we export products of the highest standards today, in the future the world comes to us for world-class care. Healthcare will be as strong an engine of economic growth as our automotive industry, setting the standard for productivity, and acting as a magnet for talent from around the world. Proud of what we will have achieved, we will have full transparency in the quality and cost of the care that we will provide.

Information will be in the hands of patients, and will shape, inspire and prompt their decisions. Dynamism and innovation will be the watchwords of our health system because of the power of each individual decision made by patients and their increasing personal responsibility for their health.

Our society will have a new awareness of health status. Education and information will empower our citizens to make better decisions. Health sense will be common sense, and a vibrant new industry will support individuals and families to improve their health.

Our technological strength today will be the foundation for our success in the future. Technologies that empower patients to better manage themselves will flourish, and our smart analytics will ensure that we will have an ever better understanding of what improves lives.

Vision of the Netherlands' Health System in 2040

Better quality, wider choice and greater responsibility will be at the heart of our vision for the future. Citizens will have full choice and access to outstanding quality healthcare – providing care close to home where possible and concentrating highly complex care where needed. At the same time, individuals will have greater responsibility, paying for low-cost and predictable care directly, and contributing to a collective insurance package consisting of essential but high-quality services. Ultimately, healthcare is a responsibility, not a right, prompting individuals to take better care of their own health. Those that make the effort to improve and maintain their health will be rewarded with the full support of the system to achieve their personal goals.

Our health system will be in constant flux. We will devolve power and responsibility to professionals to find innovative and creative responses to patient needs, desires and demands. The greater diversity and complexity implied will be met with a strong, sustained focus on the integration of care. Better health outcomes will be rewarded and promoted, and investments in prevention and healthy behaviour will decrease the burden of major chronic diseases on health services while increasing the overall health status of citizens.

We will be pioneers in health information, leaders in data collection, and explorers of the full potential of big data: We will be a hub for this new, emerging global industry, and the natural home for the headquarters of the "Bloomberg of Health". We will be the benchmark among countries for setting evidence-based professional standards and quality criteria. Healthcare, and our new health information industry, will be an engine of growth for the economy, a major employer, and a source of export earnings.

Vision of Spain's Health System in 2040

In 2040, Spain will still be one of the healthiest populations in Europe. Instances of lifestyle diseases will be considered a failure since an outstanding model of care will proactively prevent avoidable diseases and keep populations healthy. We will have strict quality and safety standards across the system, positioning Spanish providers at the top of worldwide performance. Every child will be tutored in health literacy while empowered adults will have the information available to make the best decisions for their health.

The way we deliver care will be developed towards innovation and clinical excellence. We will embrace the innovations that will allow us to excel in care and we will drastically shift staffing models, resource allocation, management and technology towards population needs. Clinical excellence will be the main criterion in the planning and organization of delivery of healthcare. We will bring the best of the public and private sectors to contribute to the long-term financial sustainability of the system. We will have set up a culture of iterative and continuous improvement both in clinical care and management, bolstered with transparency.

Our healthcare sector will not only be sustainable but also contribute to the country's economic growth. We will leverage our excellent infrastructure and high-profile professionals to develop a "high efficiency, high quality" system that will be an international leader in clinical and management innovation. Our system will be recognized for providing health services inside and outside our borders by having a solid health industry in many different dimensions. By 2040, our health system will be vital to attract foreign investment, and will be an exceptional complement other sectors (i.e. tourism).

Vision of England's Health System in 2040

Our national health will be a bastion of our values of access and equity. Healthcare delivery models will be ever changing and dynamic, and will test, celebrate, and rely upon innovation. The primary locus of care will be the home, powered by technology and remote diagnosis, treatment and monitoring. Hospitals will be highly specialized "centres of excellence", funnelling highly skilled professionals, resources and patients to build the expertise and training opportunities that will push the frontiers of medical knowledge.

Our patients will have genuine choice. This will be based on full information on the value of a treatment compared with the cost. Patients will track results from providers, developing an important understanding of which deliver the best care with the most consistency. We will be a hub for innovation in medical technology, fuelled by centres of excellence that will draw admiration and patients from across Europe and beyond.

Our citizens will be empowered and informed to cultivate a focus on wellness and prevention: They will be responsible to themselves and their communities for their health decisions and lifestyles, sharing some of the cost of their elective care and supporting families and neighbours in their health. There will be a clear cultural emphasis on wellness and on care for patients that includes their care for one another.

Investments and decisions will be driven by value and data. Our health sector will be known for its transparency on results and value, which will reduce the variability of outcomes. This visibility will generate a competitive and innovative delivery sector.

Country Strategies

The workshops discussed strategies to implement the visions of sustainable health systems. In particular, participants discussed the strategies and policies of today that would turn their systems into the national visions.

Development of the strategies enabled participants to explore interesting ways to move towards their visions. Strategic thinking within this long-term perspective clarified the focus today for the system to be fit for the future.

While the discussions covered several topics, each country focused on a particular theme:

China. Create a healthier population through investments in healthy living, supported by prevention infrastructure and research. Target the costliest and damaging conditions for research and proactive public health programmes.

Germany. Drive innovation through value-based decision-making, data aggregation and analysis, and transparency across the system by establishing a neutral national observatory to collect, store and analyse health data generated by patients, payors and providers today.

Netherlands. Lead the charge on health data analysis, establishing national quality and cost metrics, legislating health data transmission, and investing in a world-leading data aggregation and analysis capability – a "Bloomberg for Health".

Spain. Ensure consistency and quality through transparency and a common definition of value, while reducing demand through population education and individual incentives.

England. Shift healthcare out of hospitals into communities, spurring innovation through greater competition in delivery, introducing more humanized care into healthcare, and investing in behavioural change and prevention to diminish demand.

The table below summarizes the agreed strategies emerging from the subsequent debate. Many similar themes emerge, although nuanced by local culture and values. Each strategy depends on leadership, debate, collaboration and responsibility to deliver value to the local health system; while each strategy can be implemented separately, delivering the maximum value relies on greater and broader engagement.

	China	Germany	Netherlands	Spain	England
Measure value	– Publish a league table of 10 priorities for disease and related evidence-based health intervention – Communicate benchmarked performance across different provinces and different classes of hospitals	– Establish outcome-oriented resource allocation; initiate national dialogue to install outcome-oriented reimbursement system engaging both payors and providers – Providers driven towards efficiency; introduce centres of excellence that follow proved, standardized treatment algorithms – Payor as an engine for change; embed incentives for health outcomes and efficiency into Morbi-RSA health insurance financing scheme	– Establish national care standards, including a minimum package of care, minimum outcomes, and clearly outline framework of good care – Co-develop clear set of metrics with healthcare professionals, academia and payors to measure healthcare outcomes for major disease areas – Develop a new rewards system for healthcare professionals based on outcomes and value creation instead of volume	– Obtain common agreement among key stakeholders (such as Consejo Interterritorial, CC.AA., private sector and providers) on the quality and cost metrics relevant to measure healthcare value at different levels of the system – regions, centres, doctors and patients – Create independent observatories (or further empower existing ones) with a shared goal to collect, analyse and publicize the results	– Expand the mandate of the National Institute for Health and Clinical Excellence (NICE) beyond drugs and technology to the entire health ecosystem – Export NICE programme and approach across national boundaries
Establish new norm for transparency and value-based decision-making	– Establish a new services-costing system that accurately reflects the true cost and activity inputs – Combine inputs from new services cost and health economics evaluation to determine appropriate level of reimbursement to change patient and physician behaviours	– Leverage existing payor data; analyse existing longitudinal Morbi-RSA data sets over 4+ years systematically at patient and provider levels – Establish compatibility standards for fast and effective data comparison and analysis; establish neutral, national level data broker that is not a stakeholder in the system otherwise – Enable informed patients; foster business models for providing insights and transparency to patients and citizens	– Create a "Bloomberg for health" that will have trusted, validated and indisputable data on healthcare outcomes and performance; data architecture to be connected and integrated – Develop legislation around data privacy issues and ownership – Provide information on cost and quality of healthcare to consumers to increase responsibility over their health and to reward healthy behaviour – Start a public campaign and debate on the costs and consequences of healthcare decisions	– Reduce variation in performance and outcomes by benchmarking and standardizing best practices – Use information widely to reward value creation, enable managers to implement the right initiatives, incentivize professionals by results, and enable patients to improve their decision-making – Set up the means (i.e. national benchmarking) to monitor systems results, and translate those to performance management conversations	– Use technology tools to end the asymmetry of data and information between patients, providers and the public
Innovate delivery	– Provide a supporting infrastructure for remote monitoring and care, such as data and care pathway standardization and region-wide health information connectivity – Implement incentives for healthcare information technology firms to work closely with providers to design more integrated systems and solutions that can be implemented in homes and communities – Develop new home/community care delivery formats - e.g. small satellite remote diagnostic/ monitoring centres in areas of talent shortage – Private and public payors provide the incentives to adopt remote prevention, monitoring and self-care		– Promote and support self-management and restructure the delivery system; provide high- quality healthcare services close to home where possible and concentrate complex care where needed – Drive consolidation of complex care through selective contracting, setting of volume criteria for complex services, and rewarding of healthcare quality and cost-efficiencies – Promote integration of healthcare services around the chronically ill and elderly patients	– Develop and implement one or several pilots to test innovative models of care to be rolled out as best practices – Select the geographic area (region) to test new models – Define the scope of the pilot and the target population (i.e. elderly, three to four chronic conditions) – Motivate the health professionals to lead the change from the front, together with informed and empowered patients – Create a system to monitor and evaluate results and to scale up proved cost-effective interventions – Involve a large group of stakeholders (such as regional governments, patients, professionals and managers) to ensure best practices are rolled out and adopted nationwide	– Foster an innovative delivery environment – Write "early winners" legislation, rewarding innovative delivery models that deliver short-term results with sustainable impact – Allow for competition, entry and exit for low-risk treatments – Design alternative funding schemes for new treatment models (e.g. employer incentives and vouchers) and foster an environment for new industries focused on health (e.g. healthy fast food) – Continue to roll out integrated care across further regions and healthcare silos – Restrict provider and commissioning board CapEx limit on unproductive treatments

Row groupings (left margin):
- Embracing data and information to transform health and care (Measure value; Establish new norm for transparency and value-based decision-making)
- Innovation in healthcare delivery (Innovate delivery)

	China	Germany	Netherlands	Spain	England

Promote healthy lives	– Enhance current push model on prevention (i.e. mass screening, vaccination) through societal and peer pressure for healthy living, and individuals/families taking real ownership of their health
	– Foster education on healthy living and behaviours
	  – Design education programmes for the youth on healthy lifestyles, prevention, diseases and health, making being healthy cool
	  – Boost health and exercise components in school curricula
	– Open up regulatory space for the private sector to play a role and collaborate with local communities and government to promote healthy living
	– Adapt public insurance system so that the population will demand "pay for health" solutions rather than "pay for cure" (e.g. top-line payment for maintaining health of a citizen as opposed to payment per test and treatment)
		– Support and incentivize workplace well-being programmes, leveraging health as a core driver of productivity and competitiveness for individuals, companies and countries	– Create reward schemes for population showing healthy behaviour
			– Increase elevated co-payments for low-risk treatments to usher in a concept of value to consumers
				– Establish a mandatory health curriculum in every primary and secondary school, developed in collaboration with key stakeholders, engaging the Ministry of Health, Ministry of Education, regional governments and patient associations
				– Deploy massive educational campaigns to increase healthcare knowledge and awareness among the population, ensuring consistent participation and leadership of patients associations
				– Find ways to incentivize patients to use the healthcare system in a responsible way
					– Introduce a business model for population behaviour change for health (e.g. TV programming, social marketing)
					– Invest in health education in schools and communities (e.g. with local football clubs)
					– Link welfare incentives to healthy living habits (e.g. additional funds for healthier behaviours)
					– Engage with a wide set of stakeholders, develop a convincing public narrative for healthy living
					– Invest more in the human dimension of care to improve well-being and compliance with medical treatments
					– Establish a state-financed well-being infrastructure, with incentives and motivation for new health providers for healthy communities

Invest in disease prevention	– Identify the top 10 chronic conditions affecting the population, proactively design generic prevention programmes per condition, and roll out to local communities
	  – Launch more comprehensive health economics studies on the future impact of diseases
	  – Increase research funding to identify biomarkers or risk stratification tools for the Chinese population
	  – Design population pilots with academics/corporates
	  – Hone in on the diseases with the greatest impact; identify ways to not only prevent, but also to predict the future disease-risks of individuals (e.g. biomarkers or risk algorithms), and conduct large population pilots to test prevention methods and interventions
			– Develop the business case for prevention interventions and promote investments by payors through new financing mechanisms
			– Start a public campaign around healthcare prevention and healthy behaviour
			– Promote dissemination of successful initiatives in the field of prevention on a national level
				– Proactively avoid lifestyle diseases by training patients in prevention and self-care, and providing them with relevant information to support their behaviours	– Change budgets for providers of informed and chronically ill patients from five years to long-term CapEx, shifting the support system's focus to long-term healthy living
					– Link predictive models with consumption data (e.g. Tesco cards) for a more up-to-date and accurate perspective on the patient's risks

Three major themes emerge:

– Embrace data and information to transform health and care

– Innovate healthcare delivery

– Build the healthy cities and countries of the future

These themes are at the heart of the approaches taken by the participating countries. Indeed, the Forum contends that these themes should be at the heart of the approach of *every* country to achieve sustainable health systems.

Each theme addresses the underlying economics of health systems. Data and information will change the boundaries of medical possibility, ushering in an era of precision medicine and allowing us to measure value and thereby invest for the greatest returns. Innovation will be required so that healthcare delivery can keep pace with technological change, and meet the productivity imperatives on the supply-side. But long-term sustainability will be achieved only by reining in demand for healthcare – through healthier living in healthier cities and countries.

Let us examine each theme in turn.

Theme No 1:
Embrace data and information to transform health and care

Why this matters

We are entering a new age of precision medicine that fundamentally challenges past practices of medicine. As genomics becomes more sophisticated, our capacity to predict, prevent and intervene has accelerated in ways unthinkable just a generation ago. There is a much better understanding today not only of who is at risk and of which disease, but also of the actions necessary to mitigate their risk and optimize their health. Genomics also permits a more sophisticated analysis of the nature of disease and the development of targeted therapies tailored for both individual illnesses and individual patients.

The implications for the sustainability of health systems are unclear. The cost of sequencing the first human genome was about US$ 100m. Today, sequencing is offered commercially for less than US$ 1,000, a 100,000-fold reduction in cost.[5] Nevertheless, precision medicine implies a radical expansion in the scope of therapy options and therefore in cost. At the same time, precision medicine may mark a dramatic shift in the evidence for, and understanding of, which treatments work best. This may enable health systems to eliminate expenditure on therapies that are less effective or work only for specific patients, as treatment will be individually tailored.

"Big data" have arrived for our economies and societies. According to research from McKinsey Global Institute, nearly seven billion gigabytes of new data storage is added every year.[6] Healthcare is a data-intensive industry, even if the data gathered are not always used to best effect. This data revolution extends beyond the new frontiers of medicine to the efficiency and effectiveness of health systems themselves. Big data could transform collaboration and integration among different stakeholders, thereby potentially transforming how we address both health and care.

Improved data and information already are beginning to fundamentally change the way that healthcare systems operate. Transparency of clinical outcomes among different providers has been shown to improve results for all.[7] Transparency allows healthcare providers to benchmark their performances against

one another's so that there can be improvement. It allows the purchasers (or commissioners) of healthcare to make better investment decisions, potentially shifting to a pay-for-value approach that rewards outcomes rather than output. It also allows individuals to make more informed choices for themselves and their families, choosing higher- quality providers. This is an essential route towards higher-performing health systems.

Improved data also allow for a shift towards integrated care of higher quality and lower cost, with a sharp focus on chronic disease. Data and information can lead to better care, as demonstrated by integrated care schemes such as Kaiser Permanente in the United States to the NHS North West London programme in the UK. These systems leverage data sets to identify those at risk and then proactively deliver care to them. They use information technology (IT) to ensure consistent care through the better application of clinical protocols, and they share information to improve clinical decision-making in different care settings. By leveraging information, these organizations essentially alter the delivery model. Better quality and lower costs mean a higher- productivity healthcare system.

Finally, and crucially, data and information have the potential to transform the relationship between individuals and their health. Properly harnessed, new information can empower individuals to enhance their own health (through an improved diet, exercise or other lifestyle choices). It also enables individuals to better manage their condition should they be affected, by chronic disease in particular, and make superior choices when they need care.

In Sweden, 40% of the residents of Stockholm use the region's Healthcare Guide website to navigate services.[8] In the UK, the NHS Choices website of the National Health Services (NHS) is visited by 10 million users each month – one in three users has a long-term condition; 2.1 million users have downloaded Couch to 5K, a podcast about running; and 27% have said they averted the need to see a doctor as a result of using the site.[9] Indeed, greater data may allow for precisely the research that is needed to crack the code of primary prevention – allowing researchers to understand what drives individual decision-making and how to influence it.

Healthcare systems have a chance to embrace data and information in order to transform into more holistic health systems. How can healthcare systems capture this huge opportunity?

What is to be done?

The pace of technological change can rarely be influenced by any single government; it is driven by forces beyond their control. The changes that new technologies usher in can be seen across the economy and society, from the way we build and maintain relationships to the way we work; from the way we shop to where we travel, and how we spend our leisure time. Yet few healthcare systems have kept up with this wider information revolution. It is still common to see trolleys of patient notes wheeled around hospitals, or for one health-services provider to have no knowledge of the interventions of another – for the same patient. Providers that offer online booking or advice by telephone or e-mail are perceived as innovators rather than the norm.

In most countries, health continues to be a government-dominated sector. Indeed, in the OECD, government typically accounts for 80-90% of health expenditure. For their part, many emerging economies have announced bold plans to increase government investment in the health sector. China, for example, intends to spend about US$ 120 billion on a national hospital-building programme in this decade. As such, governments have a very real influence on the speed at which technological change outside the health sector is taken up within the health sector.

[5] "Life Technologies Ion Proton offers genome sequencing for US$ 1,000", National Human Genome Research Institute, accessed 3 December 2012, http://www.genome.gov/sequencingcosts.

[6] IDC Storage Reports; McKinsey Global Institute analysis 2010.

[7] Aylin et al, "Paediatric cardiac surgical mortality in England after Bristol: descriptive analysis of hospital episode statistics 1991-2002", *British Medical Journal*, 9 October 2004.

[8] www.vardguiden.se, accessed 3 December 2012.

[9] www.nhs.uk/about, accessed 3 December 2012.

Our discussions with health system leaders have shown a striking consensus on the significance of data and information in shaping future health systems. Impressive ideas have been proposed by, and to, policy-makers. Some of the best concepts are described below. They are selected because they are possible, tangible and probably desirable. Each will require further thought and serious work, however, so they are considered "policy thought-starters", rather than definitive proposals.

Pay for data

The core idea is that if data matter, then healthcare systems ought to agree on what is to be measured and pay for it – or, more assertively, not pay, if the associated data are not forthcoming

– The first step is to define what is measured – by creating a common set of data standards so that interventions, costs and outcomes are measured and recorded in the same way

– The power of national data sets would be multiplied if they can be measurable across countries, not just within them. One idea is to convene a working party of multiple countries (through the framework of the OECD, European Union or Organization of American States) to agree a common approach

– If data are to become ubiquitous, it will be necessary to mandate minimum data sets for providers. It also will be necessary to change provider reimbursement systems to either pay for data or not pay for care delivered without provision of the required data sets

Open data

The open-data proposition is based on the belief that health systems will improve if data are made available to form a platform for innovation, unlocking the latent talent and creativity in the wider community. Towards that end, the suggestion is to:

– Invest in the creation of interoperability standards for information systems (i.e. similar protocols to TCP/IP on which the Internet is based)

– Link local data sets nationally, and national data sets internationally

– Launch a national (or international) data exchange/data clearing house as the open source of information for health research and innovation

– Introduce an opt-out system for non-identifiable patient data used for research

My data

For the data revolution to reach its full potential, it must be something that can be embraced, owned and shaped by individuals rather than by the system alone. A few ideas to accelerate the journey are given below:

– Form a coalition of stakeholders to overcome data privacy concerns, by learning the lessons of other successful sectors (e.g. online banking) and communicating to the public the enormous potential of the data revolution to save more lives and improve the efficiency of health systems

– Legislate, so that patients own their records and patient identifiable data are allowed for use only in direct care, unless the patients give active consent for use in research

– Ensure patients have online access to their own medical records, to information on the quality, accessibility and cost-effectiveness of different providers, and to the right information about their conditions and treatment or care options so that they can make the right choices for themselves

Data and information have the power to transform medicine, individual health and healthcare systems. There is enormous potential to fundamentally alter the relationship between individuals and their health. Leaders of health systems can start the strategic shift towards long- term sustainability by pursuing the three policy areas: pay for data, open data and my data.

Theme No 2:
Innovate healthcare delivery

Why this matters

During the 20th century, the developed world defeated the challenge of infectious disease within its borders, inverting the proportions of the major causes of death. Today, this is true also in developing countries. Indeed, 63% of global mortality in 2008 was from non-communicable diseases, according to the World Health Organization (WHO). [10]

At the same time, injuries and fatalities at work have shrunk dramatically. For example, in 1913 in the US, an estimated 25,000 fatalities occurred at work, along with 3.25m non-fatal injuries – this meant about 3.4% of the population was injured or killed at work that year.[11] By 2011, the number had fallen to 4,600 fatalities (of which 41% were through transportation) and 1.2m injuries – this amounted to 0.37% of the total population.[12]

Despite the decisive shift in disease, injury and fatality, the fundamental structure of healthcare systems – acute hospitals and physician offices – has barely altered in at least a century. While the boundaries of medicine exist at the limits of science, the healthcare delivery model is firmly stuck in the past century. Some in the health sector view cautiously, even suspiciously, improvements such as online booking and telephone-based services that are common in other sectors. Powerful vested interests maintain the status quo.

At every Forum event, participants articulated the necessity – indeed, the inevitability – of reinventing healthcare delivery models. They imagined radically different ways of doing so. In the UK, ideas ranged from making the home the main setting of care to seamless, virtual interaction with doctors. In China, the suggestion was for an entirely new profession of proactive health counsellors dedicated to keeping people well. In Germany, hyper-efficient surgical centres were proposed, which would engage high volumes at low cost and high quality. In all cases, participants described a future enabled by technology and efficient use of the talents of clinical professionals.

Yet the future is here already. Precisely this type of innovation is taking place in emerging markets. Unencumbered by legacy infrastructure and systems where out-of-pocket payments predominate, innovators have created delivery models that dramatically raise quality and lower cost. For example, the Aravind Eye Care System in India is able to deliver better outcomes (lower mid- and post-surgery complication rates) for cataract surgery than the NHS in the UK. It performed two-thirds of the volume of NHS surgeries at one-sixth of unit cost. This is after adjusting for purchasing power, so the figures are comparable (see Figure 3 overleaf).

[10] http://www.who.int/gho/ncd/mortality_morbidity/en/index.html, accessed 4 December 2012.
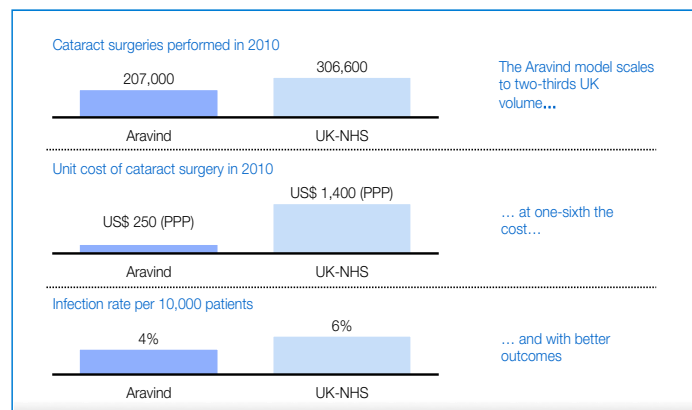
[11] Deblois, L. "Has the industrial accident rate declined since 1913", *Proceedings of the Casualty Actuarial Society*, 1927.

[12] *Census of Fatal Occupational Injuries*, National Bureau of Labor Statistics, 2011.

Figure 3: Aravind Eye Care

Aravind is successful at improving access and reducing costs while ensuring quality comparable to the UK's NHS

Cataract surgeries performed in 2010

	306,600	
207,000		The Aravind model scales to two-thirds UK volume...
Aravind	UK-NHS	

Unit cost of cataract surgery in 2010

	US$ 1,400 (PPP)	
US$ 250 (PPP)		... at one-sixth the cost...
Aravind	UK-NHS	

Infection rate per 10,000 patients

	6%	
4%		... and with better outcomes
Aravind	UK-NHS	

Innovations appear to fall into four broad "clusters": franchised models for low complexity care, such as ambulatory clinics; technology-enabled networks such as telephone-based triage (the process of determining the priority of patients' treatments based on the severity of their condition); so-called focused factories such as the Aravind Eye Care System; and integrated care such as Kaiser Permanente and Geisinger in the US, the NHS in North West London and Torbay in the UK, Bundesknappschaft in Germany, and in the Valencia region of Spain. The "secrets of success" behind these innovators are described in Figure 4.

Figure 4: Secrets of Success

What do these innovators do differently?

1. Get close to the patients and follow their established behaviour patterns
   - Lower distribution costs
   - Improve adherence to clinical protocols

2. Reinvent the delivery model by using proven technologies disruptively
   - Extend access to remote areas
   - Increase standardisation
   - Drive labour productivity

3. Confront professional assumptions and 'right-skill' the workforce
   - Reduce labour costs
   - Overcome labour constraints

4. Standardise operating procedures wherever possible
   - Eliminate waste
   - Improve labour and asset utilization
   - Raise quality

5. Borrow someone else's assets
   - Utilize existing networks of people or fixed infrastructure
   - Reduce capital investment and operating costs

6. Open new revenue streams across sectors
   - Share costs
   - Capture additional revenues
   - Enable cross-subsidization

Action is already under way to capture the opportunities offered by these innovations. Conceived through a World Economic Forum project in 2009-2010, the International Partnership for Innovative Healthcare Delivery (IPIHD) was launched at the World Economic Forum Annual Meeting 2011 in Davos-Klosters and is hosted by Duke University. The partnership – between innovators, investors, academia and industry – seeks to support innovators to scale up their businesses and to replicate them across national boundaries.

[1] A purchasing power parity (PPP) adjustment was applied to convert the costs to comparable PPP dollars; as per the Global Insight PPP rates in 2010, a rate of 18.63 was used for India and 0.61 for the UK

[2] Aravind unit cost is based on a weighted average cost over free (0 rupees), subsidized (750 rupees), and paying (9,000 rupees) cataract surgeries

Healthcare systems face a fundamental choice: either adapt their systems to welcome innovative providers or change the regulatory environment and incentives to encourage incumbents to adopt the same set of principles as the innovators. Given the desirability of these innovations or innovative approaches, what is to be done?

What is to be done?

The question of sustainability cannot be answered without addressing the way in which real care is delivered. How resources are used – the productivity of the overall sector – is at the heart. Given the fundamental choice facing healthcare systems – whether to embrace new providers or encourage incumbents to reform – it is not surprising that a broad set of policy ideas emerged from our efforts in 2012. The policy thought-starters included opening up to innovation, incentivizing innovation, and changing regulatory rules so that it flourishes.

Open innovation

Innovation is about finding new answers to long-established problems. This implies openness to new ways of working and new ideas. Policy-makers should reflect openness in the way they license, register and pay providers. They should:

– Update licensing and registration rules for providers to deliver healthcare services, becoming agnostic about ownership (public, private or not-for-profit) but focused on quality of care (safety, effectiveness and experience)

– Change the rules on who can get paid by public payors; embrace new providers and open up the market to innovations that raise quality and lower cost

Incentivize innovation

For innovation to happen, there must be a compelling reason for change. New payment models are necessary if policy-makers are to prompt a transformation in their health systems. They should:

– Reform payment mechanisms to change to whom payments are made and how much is paid for what care. For example, consider the introduction of "normative" classification of patient cases (diagnosis-related groups or DRGs) set at the cost of innovative, high-quality care, rather than at the cost of average quality care; pay for e-mail, tele-health and telephone consultations as the norm

– Introduce capitation-payment models to shift risk from payors to providers, giving providers a strong incentive to innovate, while strongly regulating quality and access to care to properly protect patients

– Ringfence 2% of the budgets of innovative healthcare-delivery models and distribute based on the quality of locally generated proposals

Change the rules

For innovations to succeed, the regulatory environment must be updated to reflect the reality of risk, rather than historic norms (often captured and sustained by vested interests). This means starting with the best interests of the patient and working from there.

– Move from self-regulation to shared-regulation between professionals and patients, changing the scope of who is allowed to do what (e.g. allow more nurses to prescribe medications and treatments)

– Introduce "right-touch" regulation that is proportionate to risk rather than historic patterns of service delivery (e.g. allow prescribing over the phone)

– Permit providers to train to the task required of professionals, rather than a generic set of skills. Strengthen core skills such as teamwork, communication and leadership

Many of the answers to the productivity challenge already exist. The challenge is implementation. Action from policy-makers is necessary to fuel innovation in healthcare delivery, and to close the gap between what we know and what we do.

Theme No 3:
Build the healthy cities and countries of the future

No matter how lean and efficient, a healthcare system cannot be sustainable unless the growing demand for healthcare is slowed. As described in 2011, the key drivers of growth in healthcare expenditure are expectations of health safety allied with a mounting burden of disease.

Expectations are raised as people go through the stages of growth in Maslow's hierarchy of needs. These expectations are independent of the health system, and indeed some commentators have suggested that health system leaders raise expectations to intensify the necessity for reform. Easing the disease burden, which is driven by unhealthy lifestyles and ageing, is the only way to relieve the pressure on health systems. The phenomenon of an ageing society is not addressable. The focus therefore is on promoting healthy lifestyles that can lead to not only longer, but also healthier, more productive lives. We must build the healthy cities and countries that are fit for the future.

People often find it hard to quantify the value of their health until it has been diminished or impaired in some way. For good health to be secure and sustainable, human behaviour needs to be influenced rather than directed. Accordingly, behavioural change requires a variety of actors and institutions to help people towards healthy living. Sustainable health systems will depend upon sustained health at home and in communities, well before the healthcare system, as it is currently known, is called upon. Cultural norms, urban planning, the environment, choices in food and drink, how children are parented and educated, personal and professional development throughout our lives, and work-life balance must all evolve in a mutually supporting web to create a new age of healthy behaviours.

Figure 5 was created at the World Economic Forum Annual Meeting of the New Champions 2012 in Tianjin, People's Republic of China, and illustrates the complexity of the task at hand.

Policy-makers, health system leaders, industry, and the civil society must collectively embrace this complexity, not shy away from it. As our interviewees and participants observed, effort must be invested in a multi-sectoral approach, which has been shown to work, albeit on a small scale.

In Australia, the town of Colac established a "Be Active, Eat Well" three-year programme in 2003. The result: exercise and fruit consumption went up; weight gain, waist size and Body Mass Index went down.

In the Netherlands, an initiative called "Well-being on Prescription" has been started in 2012 to integrate well-being and healthcare services. General practitioners refer patients to well-being organizations that provide support such as physical activity for the elderly or courses on sleeping. The co-operative initiative aims to lower healthcare consumption and improve well-being.

Figure 5: Sustainable Health Systems – Workshop Output

Source: Scribe of the Sustainable Health System Workshop at the World Economic Forum Annual Meeting of the New Champions 2012.
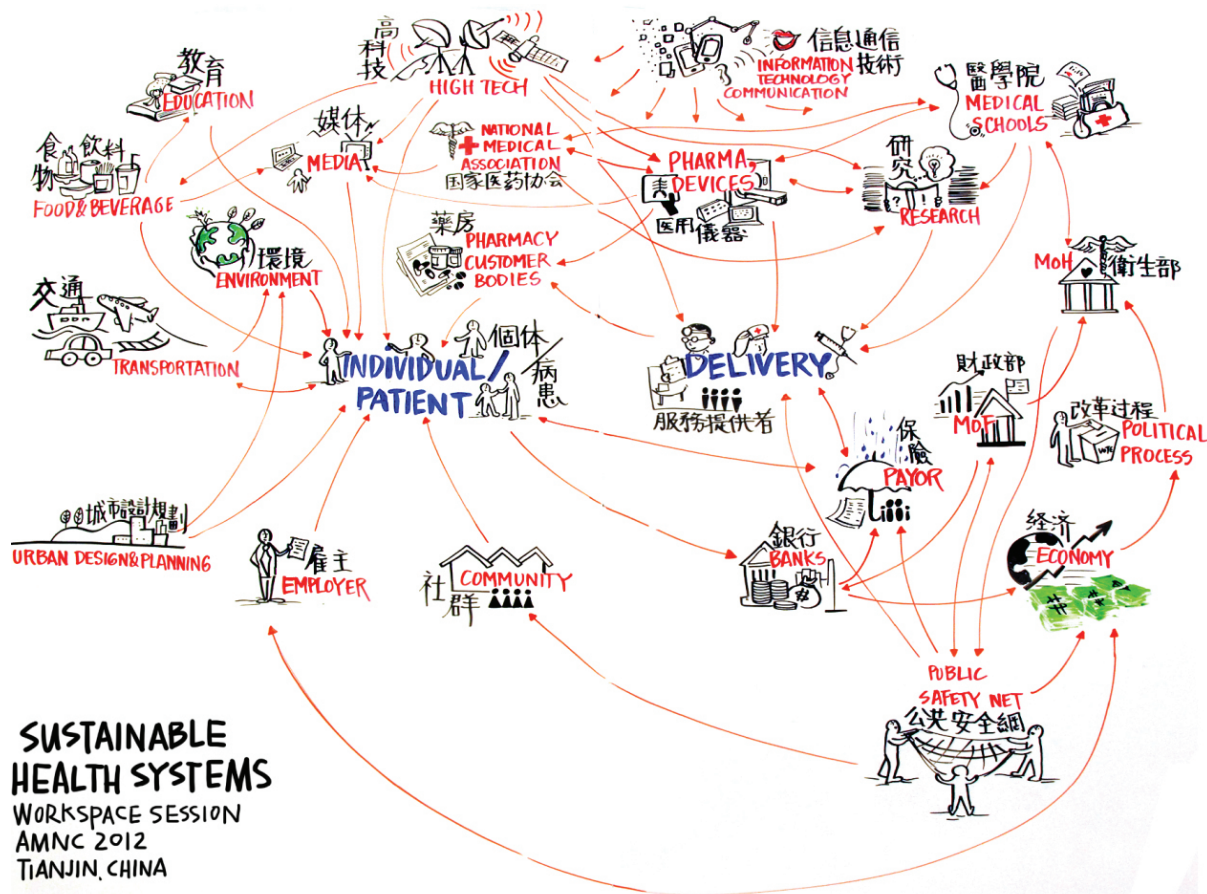
Today, the world has an historic opportunity to build the healthy cities and countries fit for the future. Emerging economies are industrializing and urbanizing at an unprecedented pace. In China alone, the rate of change is 10 times that of the Industrial Revolution, in terms of acceleration in GDP, and 100 times the scale, in terms of the population affected by the change. By 2025, one billion of China's people will have moved to the cities.

Indeed, new cities are emerging all over the world. Nations have a unique opportunity to rewrite community structures, urban planning, local government interventions and education. By 2025 there will be twice as many megacities as today. These cities will represent more than half of global GDP and house more than half of the world's population (see Figure 6). Cities therefore need to be designed effectively to give their populations sufficient access to health. They need to give them access to: activity through health-conscious infrastructure designs; nutrition through transportation, subsidization, incentives and education; and social well-being, through community spaces where people can come together.

Figure 6: The Urban Population in 2025

Source: McKinsey Global Institute.

Population
LOW ←————→ HIGH
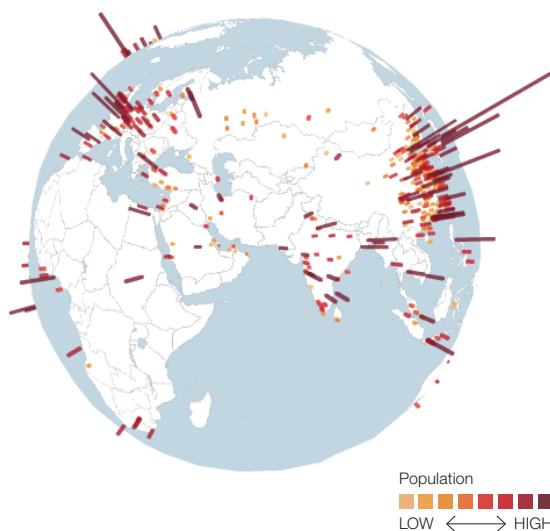
This is an inflection point that demands strong leadership and clarity of purpose. Investments in infrastructure will be made, but the question is whether and how health can feature in the decision-making. Now is the time to build cycle lanes and public spaces, homes and offices, public transport and private incentives all geared towards healthy urbanization. If emerging markets embrace these opportunities, they will set an example for the world to follow.

What is to be done?

The central challenge is to engage a wider set of stakeholders to contribute to better health for all. Health system leaders must work with policy-makers, industry heads and other multi-sector actors.

The Forum's Healthy Living project outlines some ideas for including stakeholders in efforts to improve population health. The Charter for Healthy Living presents concrete multistakeholder action for individuals, families and communities worldwide to lead healthy and active lives.

Interviewees and participants at the Forum's country workshops also put forward ideas, some of which are controversial. These ideas are reported but left to others to continue the debate and make decisions.

Change what we consume

In recent decades, obesity has been rising at alarming rates. Consumption of alcohol and tobacco has either increased or remained stubbornly high or failed to decrease as rapidly as hoped. Health system leaders identified some radical ideas to change what we consume:

- Examine the spectrum of possible interventions (e.g. incentives, policies aimed at behaviour changes, new taxes) to influence the pricing and consumption of alcohol, sugar, salt and saturated fat

- Collaborate with industry to improve labelling of food and beverages and encourage product innovation that either maintains or enhances quality and satisfaction while improving health (e.g. reducing the quantity of salt in foods)

- Restructure tax policies to make exemptions for investment in fresh-produce supply chains (e.g. lower property taxes on fresh-produce stores)

- Invest in supply-side innovation to enable wider distribution of fresh produce at lower costs to consumers

Change how we think

A consensus emerged among project participants that education could potentially be the "silver bullet" to cure healthcare's ills. Moreover, they identified a wider change in social values, to change how we think about and value health. Their ideas included:

- Teach children as much about chronic diseases that they may experience, or that their friends or family members already may have, as about photosynthesis in plants

- Teach school children about nutrition and how to prepare fresh-produce-based meals

- Improve health literacy at every age, starting with schoolchildren and continuing until the end of life, by creating tailored online modules and creative tools that can empower people

- Leverage civil society to generate new social norms about health, exercise and nutrition (e.g. make obesity as socially toxic as smoking)

Change where we live

Given the spectacular rate of urbanization, what are the opportunities and challenges in many countries for building the healthy cities needed for the future? Participants focused on changing the rules of urban design and planning:

- Mandate pavements/sidewalks and properly protected cycle lanes become an integral part of new highway construction in new cities

- Reform planning policies to create communal space for exercise indoors and outdoors, with the cost borne by property developers

Promoting healthier lives remains a puzzle that has not yet been solved. Promising ideas need to be tested in practice to ensure they can achieve the desired impact. Given the broad nature of the challenge – that our health is influenced by a variety of actors and circumstances – the policy ideas are likely to provoke strong reactions. Now is the time for the debate.

As healthcare systems aim to rise to the challenge of sustainability, the three themes of embracing data and information, innovating healthcare delivery and building healthy cities and countries stand out as promising. Their success is neither assured nor guaranteed, but the emerging global consensus is that they represent our best chance. The only way to move forward is to focus on taking action – and sharing and learning from one another's mistakes and successes along the way.

Critical Uncertainties

Health systems are shaped by each country's unique social, economic, cultural and political determinants. This helps explain why health systems vary across the world.

Exploring how these determinants will change in the future can help in the understanding of how health systems could be very different from what they are today. For that reason, health system leaders must remain aware of the broader context in which they operate, and test their visions and strategies against it.

A useful way to maintain such contextual awareness is to identify critical uncertainties. These are factors that are vitally important yet highly changeable in terms of future outcomes and impacts on the health system.

Six critical uncertainties emerged through workshops and extensive stakeholder consultations (see Annex 1 for a complete list).

These critical uncertainties are discussed below:

– Attitudes towards solidarity

– Origins of governance

– Organization of the health innovation system

– Access to health information

– Influence over lifestyles

– Health culture

Attitudes towards solidarity

Will solidarity-the willingness of individuals to share population's health risks - increase, decrease or be conditional upon certain factors?

Underpinning many current healthcare systems is the notion of solidarity – the willingness of individuals to have health risks shared across the population.

If sharing of risks is seen to be cost-effective and fair, and the benefits of pooled-risk systems are transparent, then a high degree of solidarity is likely. On the other hand, social inequalities might arise. Ageing populations are expected to place heavier financial burdens on younger generations, and deteriorating fiscal conditions may affect the quality of government services. These trends can influence attitudes about solidarity, and reduce support for sharing of risks.

Cultural values also vary by society and change over time. Looking towards 2040, health can be seen either as a basic universal right, protected through regulation, or as a commodity organized and delivered through market forces. For example, lifestyle diseases can be seen as either a controllable and personal responsibility, or the responsibility of wider society. How such values evolve will have a significant impact on the degree of support for solidarity.

Origins of governance

Will power and authority be predominantly located at the national, supranational or local level?

The level at which governance – the structures and practices of decision-making, leadership and financing for health – is located is important. The level, from local through to supranational, shapes the rules for health system actors and the subsequent form of health systems.

Traditionally, national governments have played a significant role in the governance of healthcare systems. But their influence could be in flux leading up to 2040. It is unclear if their current role will be maintained, given the trend towards transferring power to regional organizations, megacities or networks of individuals, and the seeming change in perception of health as a consumer, rather than a public, good.

Indeed, governance for health in 2040 might be transferred to the supranational level. This can open up opportunities for firms to participate in the healthcare and future health systems of other countries. On the other hand, concerns about accountability and effectiveness are also driving initiatives for local governance. How these forces play out will significantly shape the governance of future health systems.

Organization of the health innovation system

Will innovation come from within or outside the existing system? What will be the level of funding? What will be the types of innovation produced?

Health innovation systems in the future might be significantly different from what they are today.

The level and types of innovation are the result of a number of factors, such as the focus and availability of funding for research and development, political priorities, regulatory frameworks, patent protection and economic conditions.

There is much talk of new approaches to diagnostics and treatment and of innovations enabling people to directly manage their own health. For example, Patients Like Me, an online group, allows people to share their health data.

When considering innovations that could shape the future, it is important to look well beyond the current system as disruptive innovation sometimes originates from outside the traditional industry. Governments also may intervene in markets to drive investment priorities (e.g. the Orphan Drug Act in the US, which is designed to facilitate the development and commercialization of drugs to treat rare diseases).

How these factors play out will shape the nature of health innovation (see Box 3).

Box 3: Innovation Ecosystem

"The health innovation ecosystem is in flux….there is no consensus as to how innovators, funders or governments are strategically positioning themselves, on what the future structure of the sector is likely to be or on what an appropriate future governance system looks like."

Source: Biomedicine and Health Innovation, OECD 2010. http://www.oecd.org/sti/biotechnologypolicies/46925602.pdf.

Access to health information

Who will take responsibility for collecting and analysing health data? Will people give their consent for their personal data to be used?

It has long been recognized that harnessing information generated in the health system offers meaningful opportunities for generating efficiencies and improving outcomes. For these benefits to be realized, however, data need to be organized, disseminated and used.

Governments accumulate enormous amounts of health data through administration of public health and healthcare systems. If trust in government increases, it could be seen as having the legitimacy to store, centralize, use and distribute health data. On the other hand, individuals in the future might demand more control over their own data that they could potentially store and share. In an age of "big data" (see Figure 7), increasing opportunities will be available for specialist firms to organize and sell a range of health information.

However, concerns over privacy and security are leading to national policies that limit data connectivity. For example, German law requires every patient's medical record number to be changed every three months. The possibilities of access to, and use of, information in the future might have less to do with technology and more to do with human concerns. How these apprehensions shift over time will determine the degree to which health information can be used.

Figure 7: Capture of Data Is Growing at a Stunning Rate

Source: IDC storage reports; McKinsey Global Institute analysis.

New data stored by geography, 2010
Petabytes (i.e., 1 million gigabytes)
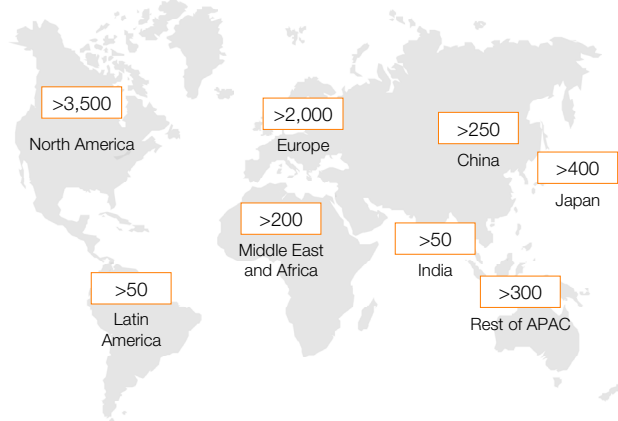
- North America >3,500
- Europe >2,000
- China >250
- Japan >400
- Middle East and Africa >200
- India >50
- Latin America >50
- Rest of APAC >300

Influence over lifestyles

To what degree will active influence over individual lifestyles be accepted and implemented?

People are subject to influences on their lifestyles through societal consent, but not necessarily through making the choice themselves (e.g. public smoking bans are deemed desirable at a societal level, but may not be welcome to some people). The influence on lifestyle comes from families, communities, organizations or governments.

Lifestyles can be influenced through regulation, fiscal policy and incentives, public information campaigns, education and choice mechanisms or "nudging" (such as changing the default in organ donation to opt-out instead of opt-in). Figure 8 shows an example of the impact one country achieved through such policies.

Source: The National Bureau of Asian Research, Centre for Ageing and Health.

% prevalence in the population
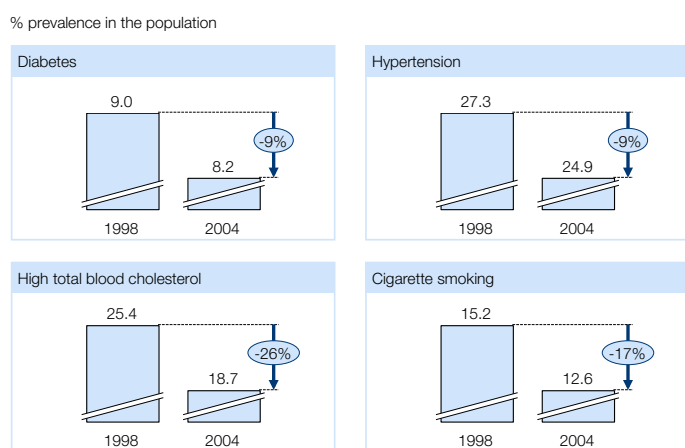
In some cultures and groups, however, such policies are viewed as overprotective or unduly interfering with personal choice. For any influence measures to work, tacit approval from wider society is a minimum requirement.

Health culture

Will healthy living be a minority choice, a civic duty or an aspiration?

Health culture refers to the definition and pursuit of health in society. There are different understandings of "being healthy" (e.g. physical health, mental health or emotional well-being). The values and attitudes shaping health culture define the lifestyle that a society describes as "healthy".

Education can drive health awareness in most parts of the world, but to what extent this translates into actual habits is unclear. The environment (e.g. workplace, transport systems) also shapes healthy lifestyles. Different cultures and societies also might find different solutions to healthy living and how to pursue it.

Moreover, how "risky behaviour" is defined may evolve, as may healthy living. Just as the discovery of antibiotics assuaged fears of common infections, an equally significant breakthrough in the treatment of cancer, obesity or heart disease may change attitudes towards diets and smoking.

Scenarios

As the critical uncertainties demonstrate, very different contexts for health systems are highly plausible in the future. Policy-makers and industry leaders must therefore be mindful when considering strategies that the health systems of tomorrow will likely be very different from those of today.

Three scenarios were developed to explore how the uncertainties could shape health systems of the future. Each scenario facilitates a detailed insight into an alternative future. As a set, they permit a comparison and contrast of the different futures. The scenarios can facilitate strategic-thinking and improve decision-making in the present. These are neither forecasts nor preferences, but reasonable stories of the future that can be used to test visions or strategies.

The scenarios can also help health system actors to develop early warning mechanisms that draw attention to critical, but emerging, developments.

Three scenarios for future health systems

In **Health Incorporated**, the boundaries of the health industry are redefined. Corporations provide new products and services as markets liberalize, governments cut back on public services and a new sense of conditional solidarity emerges.

In **New Social Contract**, governments are responsible for driving health system efficiency and for regulating organizations and individuals to pursue healthy living.

In **Super-empowered Individuals**, citizens use an array of products and services to manage their own health. Meanwhile, corporations compete for this lucrative market and governments try to address the consequences.

Stakeholders from across business, government and civil society met in a series of workshops to discuss and describe scenarios for future health systems. Two key insights came out of these discussions.

Firstly, focusing on efficiency gains alone is insufficient and will not achieve sustainable health systems. Equal emphasis needs to be placed on achieving a reduction in demand for healthcare services.

Secondly, change and events outside the control of the health system (e.g. agriculture and food, transport and the environment) are shaping health outcomes and the supply and demand of healthcare services. Therefore, to achieve long-term sustainability actors and organizations within the health system need to be prepared to withstand and adapt to external shocks and changes in context.

Healthy living as a minority choice

Data managed by organizations, individuals can opt-out

Solidarity is conditional

Business funded and managed innovation

Lifestyles influenced by organizations, opt out possible

Supranational governance
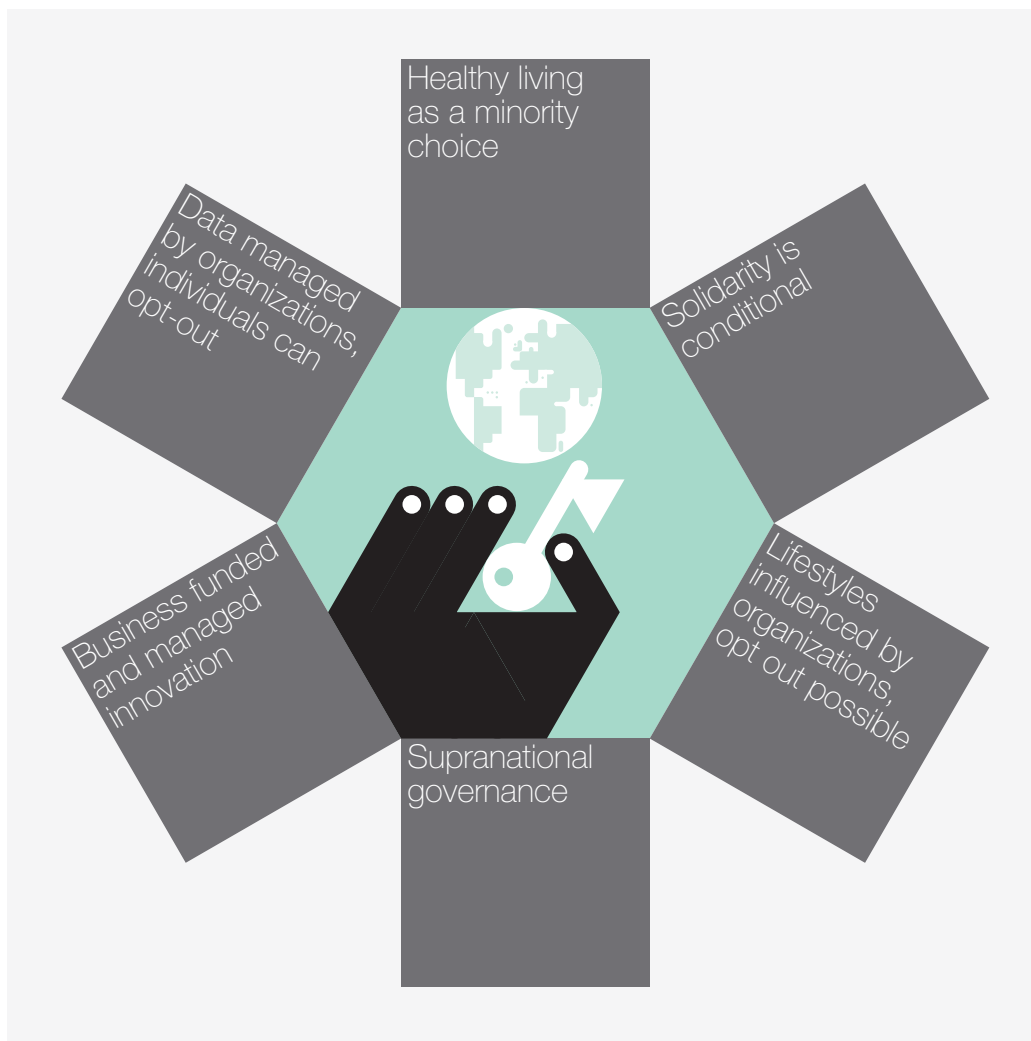
Health Incorporated

In *Health Incorporated*, the boundaries of the health industry are redefined. Corporations provide new products and services as markets liberalize, governments cut back on public services and a new sense of conditional solidarity emerges.

To increase economic growth and spur innovation, governments liberalize their markets and enter into various supranational trade agreements. This enables health firms to access the markets of other countries.

As governments rebuild their balance sheets and adjust to ageing populations, they reduce public services to meet only basic needs and require people to contribute more out of their own pockets for health services. To defuse public tension, governments permit the private sector to step in.

Health schemes and insurance markets boom as people seek to cover their health costs. However, individuals are willing to share risks only with others who have similar or better risk profiles. People stratify into pools of varying risk exposures, some of which include benefits (such as lower premiums) for healthy lifestyles and data sharing. These health-financing schemes direct people to live in a certain way based on assessments of their risks, locking them into contracts that guarantee they adhere to these guidelines.

Governments, meanwhile, focus on regulating large integrated health providers in a complex expanding global marketplace.

New and diversified business players emerge in the health industry. Large private sector firms operate the majority of health facilities. Also, firms across different industries integrate and lay claim to new international market opportunities. For example, large hospital conglomerates buy or establish joint ventures with agricultural companies to grow a wider range of "healthy" crops and with architectural and engineering firms to offer designs for incorporating healthy living into buildings.

Innovation becomes predominantly motivated by business-to-business (B2B) demands. Organizations compete and collaborate to establish the new rules of the game – standards that accelerate the adoption of technologies and business models to improve health outcomes (including the accessing, storing and disseminating of data).

However, not all people opt into a system that owns their personal data and intrudes into their lifestyle choices; others find the offerings too expensive. Faith and community-based organizations increasingly shoulder the burden of basic treatment and care for the uninsured poor.
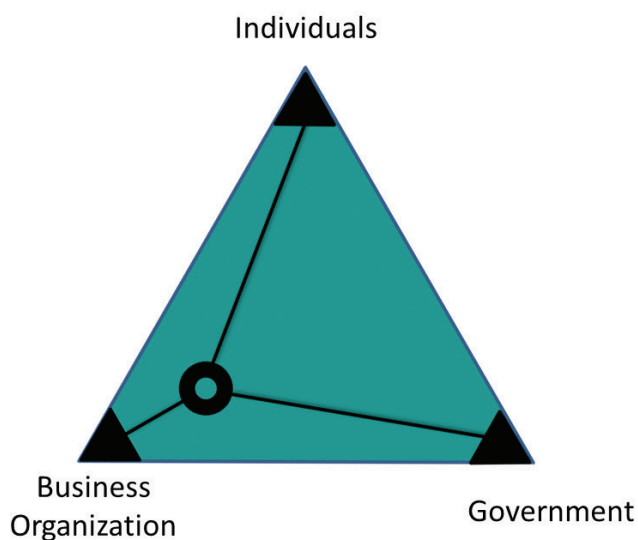
Signposts

– *UN Agencies take further steps to harmonize policies on international trade in health goods and services.* "The World Health Organization (WHO), the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO) are strengthening their cooperation and practical coordination on issues around public health, intellectual property and trade"

Source: WIPO, http://www.wipo.int/globalchallenges/en/health/trilateral_cooperation.html

– *American Mayo Clinic to open branches abroad.* "An international hospital is all set to come up in the Health Port of the Shamshabad airport SEZ. The hospital would be a joint venture between infrastructure conglomerate GMR and health institutions, Apollo Hospitals and Mayo Clinic, which would also mark the premier health clinic's foray into India. Earlier this year, Mayo reportedly made an entry into China, collaborating with a Chinese diagnostic service major, Kindstar. […] In September, a Mayo spokesperson […] had said that Mayo Clinic was committed to 'serve patients and medical providers around the world by sharing our knowledge in new ways, improving global health and advancing healthcare delivery'"

Source: Times of India, http://articles.timesofindia.indiatimes.com/2011-12-16/hyderabad/30524067_1_health-port-apollo-hospitals-joint-venture

Future signals

– *Employer-based staff certification schemes increase.* Healthcare providers continue to lobby governments and international professional bodies for greater flexibility to certify their own medical staff

– *Some national health systems are close to bankruptcy.* Fiscal constraints and relative demand for other government services (e.g. education) put severe strain on the provision of universal healthcare

– *Nearly one-quarter of the population no longer has access to healthcare.* Insurance companies are increasingly selective about who they choose to insure, even excluding people from localities considered to be environmentally disadvantaged

Questions arising from the scenario:

– Who will lead integration or consolidation in the health sector: insurers, pharmaceutical companies, infrastructure providers, others?

– How will governments facilitate and regulate B2B innovation?

– What new forms of market segmentation will emerge?

Healthy living
as a civic duty

Data managed
by governments,
individuals
mandated to
share

National
solidarity
increased

Government
mandated and
funded
innovation

Lifestyles heavily
influenced by
the government

Nation level
governance
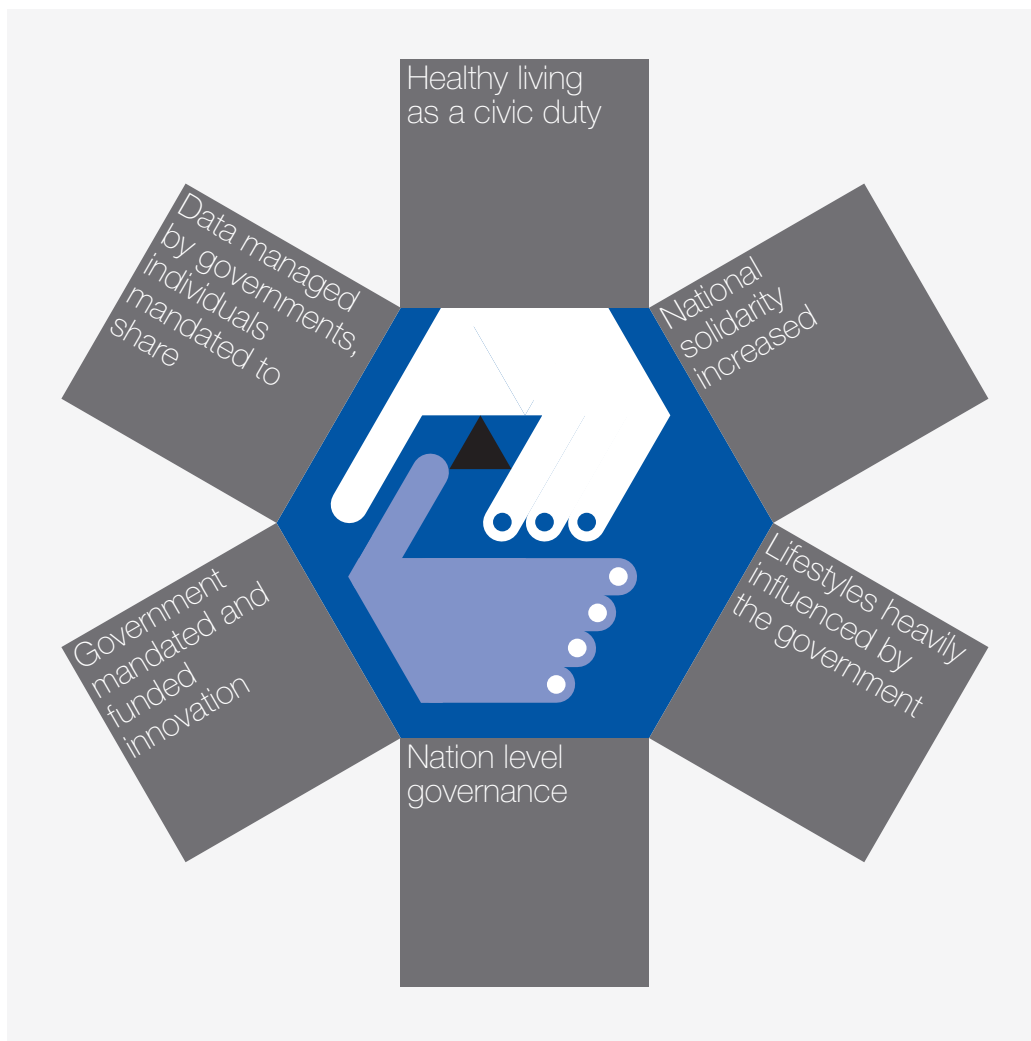
New Social Contract

In *New Social Contract*, governments are responsible for driving health system efficiency and for regulating organizations and individuals to pursue healthy living.

Against a backdrop of slowing economic growth and rising costs, health services are stretched to a breaking point. As a result, there is a fall in life expectancy for the first time in the modern age. As public funds are squeezed by the swelling cost of ageing populations, less attention is paid to the younger generation's priorities, such as education and jobs.

Public dissatisfaction with the situation forces reforms that give governments the political mandate to fix health, education and social care systems, and preserve social solidarity.

In response, governments start to implement strict measures to increase efficiency and temporarily ease the pressure on the health systems. Efficiency targets are set for health services, a public repository of health data is created to understand the most effective treatments, and regulatory control is enhanced so that only cost-efficient innovations are approved. The result? Heightened public support as health costs fall and gains are made in population health for the first time in decades.

However, the fundamental pressures on the health system remain, as the underlying causes of demand for health services are not addressed. Realizing the gravity of the situation, governments start to introduce broad initiatives aimed at influencing demand. These include the incorporation of responsible health into education and social programmes, regulations to ensure the built environment encourages active lifestyles, and taxes on fast food. Despite these plans, concerns remain that a combination of ageing, higher unemployment, unhealthy lifestyles and environmental challenges will create further problems.

The realization that healthier lifestyles are vital to control demand leads to a resurgence of welfare solidarity. After an extended political debate, the New Social Contract comes into effect. That is, governments maintain publicly funded health systems in exchange for a greater regulation of lifestyles. Healthy living becomes a civic duty, with individuals sharing responsibility for their health as part of being a good citizen, similar to obeying the law. Health also becomes a human right – an expressed obligation of the state to provide. Data allow the measurement of "health footprints" or health impact assessments for organizations, communities and individuals. Explicit targets are set for healthy lifestyles, with strong incentives for compliance.

Signposts

– *Supreme Court upholds Obama's healthcare law.* "The Supreme Court upheld […] the most sweeping overhaul since the 1960s of the unwieldy US healthcare system […] meant to bring coverage to more than 30 million of the uninsured and slow soaring medical costs"

Source: Reuters, http://www.reuters.com/article/2012/06/29/us-usa-healthcare-court-idUSBRE85R06420120629.

– *British Medical Journal blogs from the People's Health Assembly.* "The vice-minister for health of El Salvador gave a detailed picture of the progressive health reform […] which will provide national integrated health services based on the principles of primary healthcare and participatory oversight of the health system through a National Health Forum. […] Brazil [also] described progress towards a universal health system based on family health centres and "Bolsa Familia" cash transfer programme. Together, these measures are resulting in a reduction of health inequities. The El Salvador and Brazilian examples highlight the value of universal provision of public services to health and well being"

Source: BMJ Group Blogs, http://blogs.bmj.com/bmj/2012/07/12/fran-baum-blogs-from-the-peoples-health-assembly/

Future signals

– *Each government ministry appoints a senior staff member who is dedicated to integrating health outcomes into policy.* As a result of a significant social debate, health outcomes are now increasingly seen as best addressed across sectors, leading central government departments to be held accountable for health outcomes in their policies

– *Individual's health outcomes as a form of civic duty to be enshrined in tax codes.* After a long debate about the responsibility of individuals for their health, tax codes are likely to be changed rewarding individuals for proactively managing their health

– *Governments consider establishing fully funded health prevention sectors.* By taking on the role of first investor and major reimburser, governments hope to create a significant health prevention sector

Individuals

Business Organization

Government
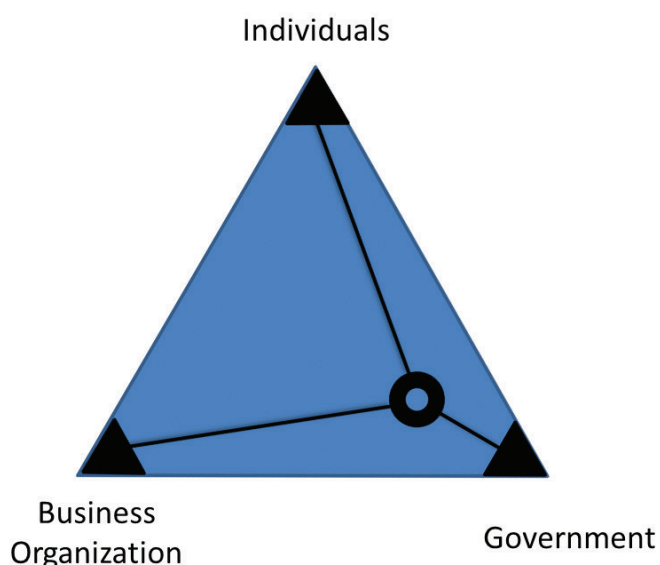
Questions arising from the scenario:

– How will healthy living be defined and by whom?

– What might employer responsibilities for health look like under the New Social Contract?

– Which policies outside the immediate health sector might be effective in managing demand for health services?

Healthy living as an aspiration

Data managed by a range of actors, individuals willing to share

Solidarity decreased locally, but increased internationally among 'like' people

All actors responding to consumer demand

Lifestyles influenced through social pressure only

Dominance of self-regulation
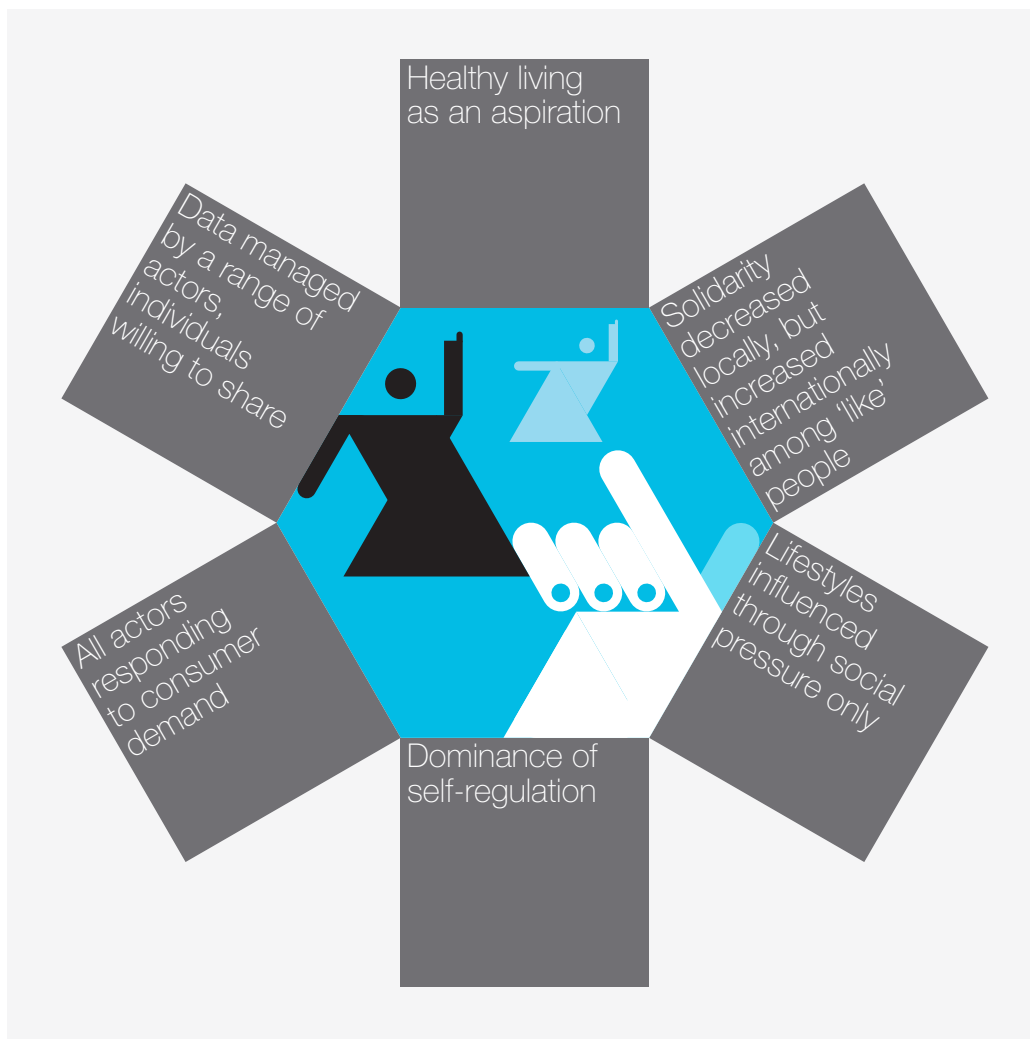
Super-empowered Individuals

In *Super-empowered Individuals*, citizens use an array of products and services to manage their own health. Meanwhile, corporations compete for this lucrative market and governments try to address the consequences.

Growing evidence of the health gains and cost savings achieved by individuals using gadgets, apps and diagnostic equipment to monitor their health, sparks an explosion of demand in these technologies. The ease with which people monitor their vital signs in real time is aided by software to diagnose, prescribe treatments and recommend tailored courses of action. Shifts in culture, public policy and business models are triggered as individuals become more empowered to manage their health and illnesses on their own.

Collecting and using personal health data becomes cool and fun. People join health-centric social networks to search for new benchmarks and to swap information on the latest tests, treatments and lifestyle fads. Websites and games enable people to assemble around topics of personal health and well-being. As a result, people become less concerned about privacy and traditional medical taboos. Healthy living becomes a hallmark of success and an aspiration, especially as people become aware of the problems of not managing their ageing well.

This culminates in a turning point, because healthcare is seen not as a right or an entitlement, but as a goal of self-actualization. Intense social pressure means alternative high-risk lifestyles are driven underground – although some fall through the cracks of the digital divide and lack the means to live like most of society.

The market booms for healthy living and wellness as corporations rush to develop products and services targeted at illness prevention and at physical and mental self-improvement. The result? The health market becomes the most dynamic part of the economy.

Governments, whose share of healthcare costs has fallen sharply, are expected to ensure quality and safety in a diverse and thriving market. However, there is growing controversy over the state's role in paying for those who did not use new technologies or maintain a healthy lifestyle, and over the health system's vulnerability to cyber crime (such as data theft and fraud).

Signposts

– Counting every moment. "Self-quantifying is being taken seriously by start-ups, in Silicon Valley and elsewhere, which are launching new devices and software aimed at self-trackers. It may even provide a glimpse of the future of healthcare, in which a greater emphasis is placed on monitoring, using a variety of gizmos, to prevent disease, prolong lives and reduce medical costs"

Source: The Economist, http://www.economist.com/node/21548493.

– PatientsLikeMe and Merck Establish Health Information Collaboration Focused on Psoriasis. "Effective use of health information provides the path forward to patient-centred care and personalized medicine," said Dr Sachin H. Jain, Chief Medical Information and Innovation Officer, Merck. "Our collaboration with PatientsLikeMe is an important part of Merck's strategy to establish and apply innovative solutions that improve disease management and enhance the patient experience."

Source: Market Watch, The Wall Street Journal, http://www.marketwatch.com/story/patientslikeme-and-merck-establish-health-information-collaboration-focused-on-psoriasis-2012-08-13

Future signals

– New health reimbursement schemes based on individual preferences proposed. Introduced by individuals' increased desire to be more active participants in the management of their care, new schemes will enable their wishes to be factored in

– Major food and beverage company close to collapse. After several years of falling demand for its products as a result of a significant cultural shift towards healthy consumption, the company today announced that it is considering bankruptcy, following the path of many industry incumbents

– The health data industry soon to become larger than the financial data market. The introduction of financial reimbursements to people to share their health data has unleashed the health data market, now making it almost as large in market capitalization terms as the financial data sector

Individuals

Business Organization
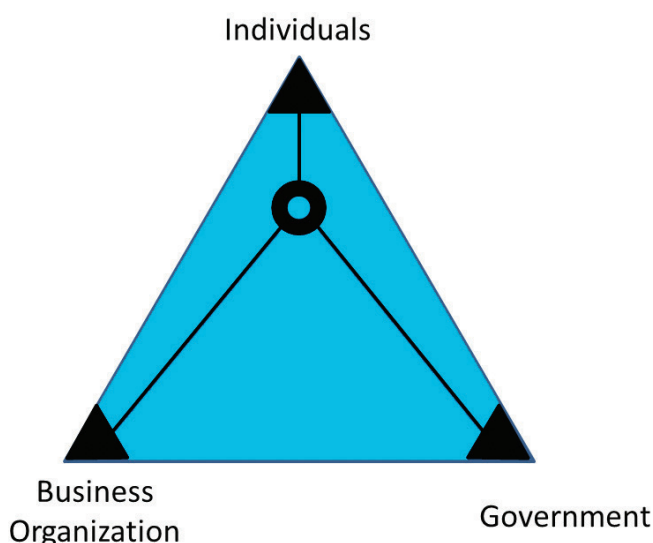
Government

Questions arising from the scenario:

– Who will own and structure health data – citizens, governments or businesses?

– How might the healthy living and wellness markets be enabled and regulated?

– How can a digital divide in health be avoided?

Conclusion

The opportunity is ripe to take action for transforming health systems. But the trajectory, dynamics and shape of future health systems remain susceptible to external forces and uncertainty. This requires health system leaders to forge a new approach and create a new mind-set as they collaborate for change with a diverse set of stakeholders and partners.

The unique mix of broad global thinking and deep country engagement in 2012 highlighted some clear messages:

Value of multistakeholder long-term thinking

There is demonstrated value in exploring long-term "drivers of change" – factors that determine the evolution of health systems. As many of these drivers lie outside of the control of traditional health actors, there is a need to make every stakeholder a "minister of health" . This empowers all actors to take collaborative action to realize long-term objectives.

No magic pill

Health system leaders are taking a proactive approach to the future, not waiting for a magic pill or a panacea. They are looking to a diverse portfolio of policies and strategies to create a more sustainable health system. That said, the long term impact and potential of technology is often underestimated.

Acknowledging uncertainty

Developing an appreciation for uncertainty has immense value, with leaders opening up to recognize the limits of their influence. The most successful participants in our discussions and workshops allowed these uncertainties to push the boundaries of what they thought was possible, and prepare for any sharp deviations in the path to the future.

Opportunity of the demand side

By expanding the boundaries of responsibility and solutions beyond healthcare, the health system becomes much more diverse and inclusive. It introduces new opportunities and stakeholders instead of costs, and enables more informed decision-makers instead of adding more patients.

More similar than different

Our work across countries and our global base of experts highlight how similar the challenges, solutions and aspirations of different nations are. While the commonly accepted idea is that the design and reform of a health system has to be specific to a country, countries can learn much from each other. The global community needs more knowledge sharing and joint problem solving.

The World Economic Forum's community will do three things in the new year to capitalize on the momentum and learning of 2012. First, we will continue to engage with developing countries worldwide to identify their long-term goals. We will work with local leaders to identify the best opportunities and the best way to achieve these goals. The aim will be to avoid the mistakes of developed health systems, and design a system tailored to their objectives. Second, we will continue to press ahead on our Healthy Living initiative, driving towards improving the environment and ecosystem to support healthy living and decisions. Finally, we will host several dialogues on the opportunities and challenges of personalized and precision health, and on the era of digital/data-based health and care.

Annex 1 – Process and Stakeholder Engagement

The Scenarios for Sustainable Health Systems project was initiated at the World Economic Forum Annual Meeting 2012 in Davos-Klosters. It was preceded by a report that emphasized the need for health systems to achieve fiscal sustainability.[13] The Scenarios project aimed to generate a rethink of the health system structure and organization, and present the findings at the Annual Meeting 2013 to drive further action.

The project was a collaboration of a diverse set of more than 200 experts, engaged through interviews and/or eight workshops held throughout 2012 (see Figure 9). Participants included policy-makers in government ministries, medical professionals, academics, and representatives of industry, civil society, and private and public healthcare providers. The experts participated in an iterative process to develop critical uncertainties, scenarios, visions and strategies as different ways of thinking about the future. It was a truly global effort, harnessing enormous energy and creativity to meet the challenges of creating sustainable health systems.

A Steering Board comprising eminent health system leaders and experts provided overall direction, and a Working Group of experts supported the project's approach and methodology. A list of Steering Board and Working Group members can be found in the acknowledgements section of this report.

Global workshops were organized in Istanbul, Basel and New York. National workshops, organized in collaboration with McKinsey & Company, took place in The Hague, Tianjin (during the Forum's Annual Meeting of the New Champions), Berlin, Madrid and London.

[13] "The Financial Sustainability of Health Systems: A Case for Change", World Economic Forum, 2012.

Figure 9: Project Workshops in 2012

Source: Authors' compilation.

October, 2012
Working Group meeting, New York

November, 2012
Country workshop, London

August, 2012
Country workshop, The Hague

September, 2012
Country workshop, Berlin

June, 2012
Regional meeting, Istanbul

October, 2012
Country workshop, Madrid

June, 2012
Working Group meeting, Basel

September, 2012
Regional meeting, Tianjin
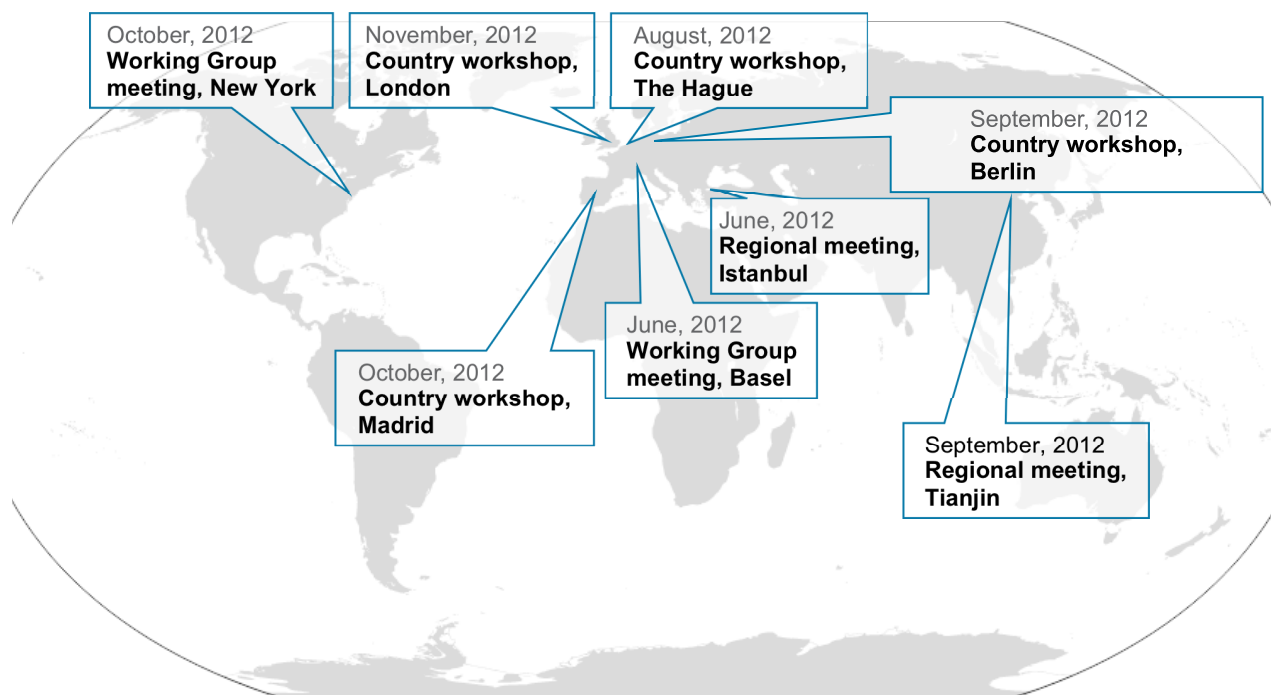
Annex 2 – Drivers of Change

Health systems operate in a wider context, affecting the way societies organize to deliver health and the goals they choose. Awareness of this context is vital to develop sustainable visions and strategies that address future challenges and take advantage of future opportunities. Key uncertainties were developed in two stages. In the first phase, interviews of experts were conducted to identify key contextual factors that significantly influence the shape and outcomes of the health systems. The interviews yielded 20 key drivers, listed below. In the second phase, these drivers were ranked on their impact and uncertainty, with the highest-ranked identified as critical uncertainties (highlighted in light blue below).

Political/Legal	Economic	Social	Technological	Environmental
Influence over Lifestyles Ability and willingness of the state and organizational bodies to directly influence the lives of the population	**State of the Economy** GDP growth per annum, national and global, as well as the drivers	**Attitudes towards Solidarity** Intergenerational, ethnic, regional and socio-economic solidarity	**Health Innovation System** Finance, regulation and drivers of health innovation	**Climate Change** Local exposure to extreme weather and changing local resource availability; weather-related mortality
Conflict Mortality and serious injury due to violence, conflict	**Resource Availability** Availability of resources (water, food, energy, land, minerals) and equality of access	**Population Structure** Distribution of various age/gender groups in a population	**Access to Information** Availability and use of digital data within the population, attitudes towards privacy and sharing of these data	**Pollution and Toxicity** Exposure to chemical, biological and/or radiation agents – occupational and residential
Origin of Governance At which level will policy for the society be set? Supranational, national or local?	**Income Equality** Gini coefficient of income distribution (including social transfers), percentage of population under poverty line	**Health Culture** Social attitudes, practices and habits towards desirability of healthy living and active lifestyles		**Incidence Infectious Disease** Population mortality and work days lost to communicable disease, as well as antibiotic resistance
Public Funding Allocation Availability of public funding and its allocation among the sectors		**Incidence of Chronic Disease** Population mortality and work days lost to non-communicable diseases		**Population Sanitation** Access to sanitary tools, preventing exposure to waste, and ensuring water and food quality
Patterns of Migration Changing population composition, due to immigration and emigration, including urban/rural		**Attitude towards Ageing** Effective retirement age and rates of activity, and participation of older population within the economy		
		Community Involvement Dynamism of civil society and involvement of local communities in health provision		

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