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Report of the Non-Communicable Disease Working Group 2012

Countering non-communicable disease through innovation

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Authors' note: Throughout this report, we have used the abbreviation NCD as the globally accepted term for all Non-Communicable Disease.

Foreword

Professor the Lord Darzi of Denham

The United Nations High Level Meeting on non-communicable disease (NCD), held in September 2011, put NCD high on the global agenda, and provided a roadmap of ways to begin tackling this major threat to global health and to the sustainability of health systems.

It is clear that current policies and health systems are not adequate when it comes to countering NCD. Innovation is essential, and as our contribution to countering NCD we have conducted research into innovations, and discuss in this report how they might be introduced on a large scale. Too often, important innovations spread slowly and inadequately.

Our report begins with an account of the extent of the problem, in order to underline the urgent need for a global response. The report does not set out to be a comprehensive plan for countering NCD. Rather, it concentrates on innovation, with the second section describing a selection of the 200 or more innovations from we have collected during our work.

The third and most important part of the report discusses how such innovations might best be widely diffused.

Finally, we emphasise that this report marks a beginning not an end, and we outline the actions we plan to take to encourage the spread of innovations. We hope that others will be inspired to work with us.



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Executive Summary

Burden of non-communicable disease (NCD). NCD (cardiovascular disease, diabetes, chronic obstructive pulmonary disease, and common cancers) is caused by tobacco, poor diet, physical inactivity, and the harmful use of alcohol. It now accounts for over 60% of global deaths, with four-fifths of those deaths occurring in low and middle-income countries. Without new interventions, the burden of NCD will rise, threatening economic development and the sustainability of health systems. Current health systems are not well designed to prevent and manage NCD, and they need to change.

Innovation to counter NCD. The World Health Assembly in May 2012 set a global target to reduce deaths under 70 from NCD by 25% by 2025. Innovation will be essential to achieve this target, and we have developed a taxonomy of innovation and built a databank of over 200 innovations. The innovations may act on the biological risk factors of NCD (hypertension, high blood sugar, high blood lipids, and obesity), on the behavioural risk factors (tobacco, poor diet, physical inactivity, and the harmful use of alcohol), or on the social determinants of NCD. The types of innovation we identified are: biological technology, information technology, medical devices, changes in the workforce, greater involvement of patients, greater involvement of civil society, and organisational innovations. The report describes 12 innovations of different types and from different countries.

Drivers of innovation diffusion. To have impact, innovations must diffuse widely, but within health systems they all too often do not diffuse. Drivers of diffusion include: professional discussion, markets, consumers, governments, international organisations, and businesses. However, there are barriers: the risk that existing healthcare providers and professional hierarchies might resist changes that threaten their dominance and income; fears that innovations will not be safe; and the risk that financial benefits from the innovation might occur in a different budget from that of the costs, and might take some years to become visible and be appreciated.

Examples of diffusion of innovations to counter NCD. A detailed examination is made of how several innovations to counter NCD might be diffused. For example, an increase in self-management will be important for all NCD, and diffusion will depend on factors such as these: building professional support, consumer demand for more self-management, and ensuring that a business case can be made and that expected savings are delivered.

What happens next? This report is intended as a springboard to action, and duly identifies seven things that should start happening right away: expanding and improving the database of innovations; developing a business case for self-management; working with a government to diffuse at least one innovation; working with finance and health ministers to make the health, economic, and business case for investment in innovation; attempting to build a social movement around one of the innovations; working specifically on innovations in areas that the taxonomy shows to have few innovations; and building a global collaboration to implement and trial one innovation to tackle an NCD.

Introduction

As the United Nations recognised at a high-level meeting in September 2011, the rise in non-communicable disease (NCD) threatens the sustainability of health systems in high-income countries and the extension of universal healthcare and overall development in low and middle-income countries. NCD includes cardiovascular disease (CVD), diabetes, chronic obstructive pulmonary disease (COPD), and common cancers, which have in common that they are largely caused by tobacco, poor diet, physical inactivity, and the harmful use of alcohol.

Innovation will be essential for responding to this pandemic. This report, after briefly surveying the extent of the problem and the inadequacy of current approaches, describes a dozen innovations, and then discusses how those innovations might be diffused through health systems. The innovations will have impact only if implemented on a large scale, and the diffusion of innovations is often a more difficult problem than the initial development of them.

Our hope is that governments and health systems will trial some of the innovations and diffusion mechanisms, in order to increase our understanding of how to counter the threats from the pandemic of NCD. We ourselves will also be working on encouraging innovations and their diffusion.

Section One: The Rising Burden of NCD

The latest estimate from the World Health Organization (WHO) is that of the 57 million deaths that occurred in the world in 2008, 36 million (63%) were the result of NCD.¹ Four-fifths of these deaths were in low and middle-income countries, and 29% of those deaths were in people under 60 – compared with 13% in high-income countries. Without intervention, deaths from NCD are set to increase by 15% between 2010 and 2020, according to WHO predictions, with the biggest increases occurring in the African, Eastern Mediterranean, and South East Asian regions (Figure 1).¹

Figure 1
Global projections for selected causes of death, 2004 to 2030

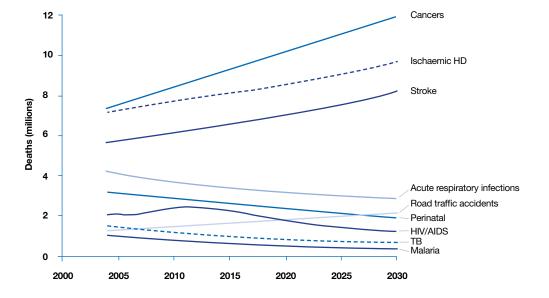




Figure 2
Leading global causes
of burden of disease,
2004 and 2030

2004 Disease or injury	As % of total DALYs	Rank
Lower respiratory infections	6.2	1
Diarrhoeal diseases	4.8	2
Unipolar depressive disorders	4.3	3
Ischaemic heart disease	4.1	4
HIV/AIDS	3.8	5
Cerebrovascular disease	3.1	6
Prematurity and low birth weight	2.9	7
Birth asphyxia and birth trauma	2.7	8
Road traffic accidents	2.7	9
Neonatal infections and other	2.7	10
COPD	2.0	13
Refractive errors	1.8	14
Hearing loss, adult onset	1.8	15
Diabetes mellitus	1.3	19

Figure 3
World Health Assembly targets and core indicators for NCD 2025

	Mortality between ages 30 and 70 due to CVD, cancer, diabetes, and COPD 25% reduction				
Indicators with targets	Hypertension 25% reduction	Tobacco 30% reduction	Salt 30% reduction	Physical inactivity 10% reduction	
	Overweight/obesity (adult	t, child, adolescent)	Policies to virtually eliminate trans fats and to reduce marketing of unhealthy foods to children		
Other WHO core indicators	Raised total cholestorol		Cervical cancer screening		
	Raised blood glucose/diabetes		Vaccination: HPV, Hepatitis B		
	Adult per capita consumption of alcohol and heavy episodic drinking		Access to basic technologies and medicines		
	Low fruit and vegetable intake		Access to palliative care		
	Cancer incidence, by type	е	Multidrug therapy for CVD risk reduction		
Other country-specific indicators of NCD and related issues including social determinations of health					

 $^{^{\}star}$ All indicators should be disaggregated by gender, age, socioeconomic position, and other relevant stratifiers

NCD is also a major cause of suffering and disability. Coronary artery disease accounts for about 4% of lost disability-adjusted life years (DALYs) and cerebrovascular disease 3% (Figure 2).² By 2030 NCD are expected to occupy three of the top five causes of lost DALYs, with CVD accounting for 5.5%, cerebrovascular disease 4.3%, and COPD 3.8% (Figure 2). NCD is also a leading cause of families' falling into poverty.³

Deaths from heart attacks and stroke have been declining for half a century or more in high-income countries, but diabetes – a major risk factor for both – is now increasing rapidly in all countries. Some 336 million people had diabetes in 2011, but this is expected to increase to 552 million by 2030.⁴ About half of those with diabetes are undiagnosed. Diabetes accounted for 11% of healthcare expenditure in the US in 2011.⁴

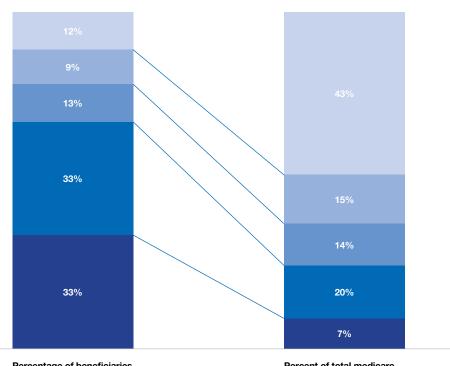
The World Health Assembly in May 2012 set a target of reducing deaths under 70 from NCD by 25% by 2025 (Figure 3). WHO estimates that 80% of premature deaths are preventable. It's worth noting that while deaths can reliably be attributed to NCD in high-income countries, most low and middle-income countries do not have reliable routine death certification; so data on deaths in these countries are extrapolated from surveys, many of which are small and geographically unrepresentative, were made some time ago, and may use unreliable methods for assessing the cause of death. Setting a global target for reducing deaths in such circumstances may therefore be a bold move, but many organisations have pressed for a global target.

It's important to recognise that most people with chronic conditions, including NCD, have more than one condition. The US has led the way, in showing that two-thirds of beneficiaries of Medicare (Americans over 65) have two or more chronic conditions, and that those with five or more conditions account for 58% of the expenditure of the Medicare programme (Figure 4).⁵ Recent data from Scotland show that by age 65, about 80% of people have a chronic condition and more than two-thirds have two or more conditions.⁶ The poorest people in Scotland who develop these multiple conditions do so typically when some ten years younger than the richest.⁶ There is little data on how many people in low and middle-income countries have multiple conditions, but the pattern is likely to be similar to that in high-income countries.

Figure 4

Proportion of Medicare beneficiaries with multiple conditions and associated costs





Percent of total medicare spending



NCD is caused largely by tobacco, poor diet (rich in calories, fat, salt and sugar, and low in fruit and vegetables), physical inactivity, and the harmful use of alcohol. WHO has illustrated how these behavioural risk factors give rise to the biological risk factors of high blood pressure, high blood glucose, high blood sugar, and obesity, and are in turn caused by social determinants like globalization, urbanization and poverty (Figure 5). Figure 6 shows the leading risk factors for death globally, with the top four positions being occupied by high blood pressure, tobacco use, high blood glucose, and physical inactivity. The World Health Assembly has set targets of reducing hypertension by 25%, tobacco use and salt consumption by 30% each, and physical inactivity by 10% (Figure 3).

The economic burden from NCD is huge, and threatens the sustainability of health systems in high-income countries and the development of health systems in low and middle-income countries. The Harvard School of Public Health have attempted to calculate the costs of NCD using three different methods, and concluded that NCD plus mental health problems would cost \$47 trillion over the next 20 years, which is about 75% of current global GDP.8 If there is no scaled-up government response in China, then NCD will, according to World Bank calculations, lead to a loss of \$550 billion between 2005 and 2015.9 Reducing mortality from CVD by1% a year between 2010 and 2040 could generate economic value equivalent to 68% of China's 2010 GDP.

There is widespread agreement that current health systems are not well-adapted to deal with a world in which NCD accounts for most of the burden of disease. These systems were developed at a time when communicable disease accounted for most of the burden, and they provide episodic, disjointed, and often hospital-based care. Figure 7 summarises the conclusions of a UK government report on how the Scottish health system would need to change if it is to respond better to patients with long-term conditions, including NCD.¹⁰ Health systems in low and middle-income countries suffer from the same problems, but in addition fail to offer comprehensive care to much of the population.

Health systems will have to change in order to respond to the growing burden of NCD, and innovation and diffusion of those innovations will be essential.

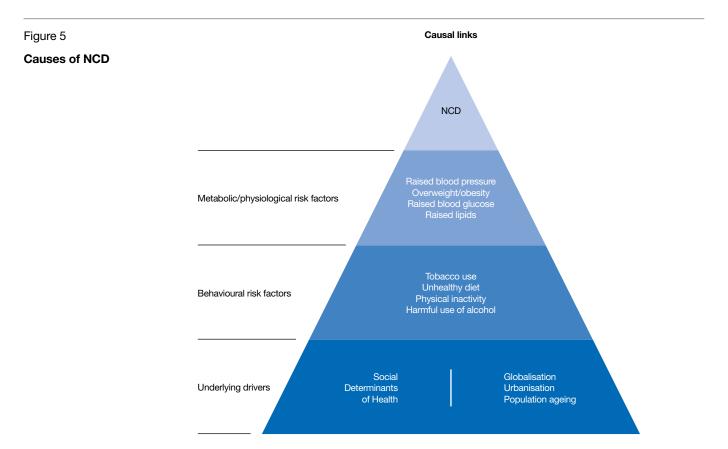


Figure 6

Leading causes of attributable global mortality and burden of disease, 2004

Attributable Mortality		Attributable DALYs		
High blood pressure	12.8%	Childhood underweight	5.9%	
2. Tobacco use	8.7%	2. Unsafe sex	4.6%	
3. High blood glucose	5.8%	3. Alcohol use	4.5%	
4. Physical inactivity	5.5%	4. Unsafe water, sanitation, hygiene	4.2%	
5. Overweight and obesity	4.8%	5. High blood pressure	3.7%	
6. High cholesterol	4.5%	6. Tobacco use	3.7%	
7. Unsafe sex	4.0%	7. Suboptimal breastfeeding	2.9%	
8. Alcohol use	3.8%	8. High blood glucose	2.7%	
9. Childhood underweight	3.8%	9. Indoor smoke from solid fuels	2.7%	
10. Indoor smoke from solid fuels	2.3%	10. Overweight and obesity	2.3%	
59 million total global deaths in 2004		1.5 billion total global DALYs in 2004		

Figure 7

How health systems need to change to be better able to prevent and manage NCD

Current view	Evolving model of care
Geared towards acute conditions	Geared towards long-term conditions
Hospital-centred	Embedded in communities
Doctor-dependent	Team-based
Episodic care	Continuous care
Disjointed care	Intergrated care
Reactive care	Preventative care
Patient as passive recipient	Patient as partner
Self-care infrequent	Self-care encouraged and facilitated
Carers undervalued	Carers supported as partners
Low-tech	High- tech



Section two: Examples of innovations to Counter NCD

We have compiled over 200 innovations aimed at reducing the burden of NCD. This information will be placed on a publicly accessible website, which we will continue to develop and expand, to the point where it becomes the leading global resource for information on preventing and reducing the risk of NCD.

We devised a taxonomy of innovations to help ensure that we identified different types of innovations, could categorise them, and therefore identify gaps. The taxonomy is a matrix that is shown in the Table below. The innovations may act on one or more of the following: the biological risk factors of NCD (hypertension, high blood sugar, high blood lipids, and obesity), the behavioural risk factors (tobacco, poor diet, physical inactivity, and the harmful use of alcohol), and the social determinants of NCD. The types of innovation we identified are these: biological technology, information technology, medical devices, changes in the workforce, greater involvement of patients, greater involvement of civil society, and organisational innovations.

We will categorise all of the innovations in our database using this taxonomy, but for now we will outline just 12 innovations that together cover many of the cells in the taxonomy matrix (see the Table below).

Figure 8 **Taxonomy of Innovations**

Mechanism	Biological risk factors	Behavioural risk factors	Social determinants
Wedialisii	For example: high blood	For example: tobacco, poor	of health
Modality	pressure, high blood lipids, high blood glucose, obesity	diet, physical inactivity, harmful use of alcohol	For example: poverty, health literacy, access to services
Biological technology For example: drugs, genetics	4 The polypill		6 Tapajos
Information technology For example: internet, mobile phones	Weqaya screening Collaborhythm Swasthya Slate UnitedHealth diabetes care	Weqaya screening Swasthya Slate Project GUIA UnitedHealth diabetes care	
Medical devices For example: mammography, CT scanning			
Changes in workforce	2 China Rural Health Initiative 3 Tonga self-management 4 The polypill 6 Tapajos health projects 8 Primary care 101 9 Swasthya Slate 12 UnitedHealth diabetes care	3 Tonga self-management 6 Tapajos health projects 8 Primary Care 101 9 Swasthya Slate	6 Tapajos health projects 10 Project GUIA
Greater involvement of patients in their care	2 China Rural Health Initiative 3 Tonga self-management 5 Collaborhythm 8 Primary Care 101 9 Swasthya Slate	China Rural Health Initiative Tonga self-management Swasthya Slate	2 China Rural Health Initiative 10 Project GUIA
Greater involvement of civil society organisations in the patient care	2 China Rural Health Initative 3 Tonga self-management 6 Tapajos health projects		2 China Rural Health Initiative 10 Project GUIA
Organisation process	Weqaya screening Tonga self-management "Money follows the person"	Weqaya screening "Money follows the person" Discovery Vitality	11 Discovery Vitality
Policy	1 Weqaya screening	1 Weqaya screening	

Innovation number 1

Population screening and associated interventions to counter NCD in Abu Dhabi: the Weqaya programme Abu Dhabi is tackling the rise in NCD through a programme called "Weqaya" (meaning "protection" in Arabic), which integrates two aspects: screening of the entire adult Emirati population for risk of CVD, and a range of targeted interventions. The United Arab Emirates has high levels of all NCD, and the second highest rate of diabetes in the world.

The programme began in 2008, and so far 94% of the adult population (18 and over) have been screened. A second round of screening began in August 2011.

The first round of screening showed that more than two-thirds of adults were overweight or obese, 44% were either diabetic or pre-diabetic, and almost half had raised cholesterol. Almost three-guarters (71%) had at least one risk factor for CVD.

The interventions to reduce these high levels of risk come from both the health and the non-health sectors. Those at the highest level of risk are offered clinical care.

All those screened are given a confidential health report, available if desired through a secure Web account, with their risks colour-coded together with bespoke recommendations for actions to reduce the risk. Individual data remain secure and confidential, but group data will be packaged up for employers and municipalities, to help them in devising programmes to reduce tobacco use, encourage healthier diets and increase physical activity.

For further information: www.weqaya.ae

Innovation number 2

Low-cost sustainable interventions for the prevention and management of cardiovascular disease: China Rural Health Initiative CVD is the leading cause of morbidity, mortality, and disability in China, with a higher burden in the North than the South. The China Rural Health Initiative has created a platform to test innovations to respond to NCD, and the initial project has two interventions:

- a simple low cost prevention and control programme for CVD delivered by primary care providers (village doctors, once known as "barefoot doctors")
- a community based salt reduction and health promotion programme, delivered by community health workers.

The project is a large randomised controlled trial based in 120 villages: 30 villages are receiving both interventions; 30 one or the other; and 30 neither. The primary healthcare package began in 2010, and the salt reduction programme began in 2011.

The primary healthcare package is aimed at men over 50 and women over 60 who have had CVD, stroke, diabetes, or hypertension diagnosed by doctors. The package comprises these components: technical training for primary healthcare workers, enabling them to screen, classify and manage high risk patients; a case management record; a digital central database and performance feedback system; and a performance based economic incentive for health workers.

The salt reduction and health promotion programme aims to reduce mean sodium intake. The programme is delivered by community health educators, and targets patients with high blood pressure. In addition, the programme promotes the sale of low sodium salt through village convenience stores.

A pilot study has shown that the salt reduction programme can reduce blood pressure significantly – enough to cause a considerable reduction in stroke and heart attacks.

The intervention is to last for two years, ending in October 2012. The main outcome measures will be blood pressure reduction for the primary healthcare intervention and 24 hour urinary sodium levels for the salt reduction programme. The project also hopes to raise awareness and understanding of hypertension, and to improve treatment and control rates.

For further information: http://www.georgeinstitute.org/global-health/improving-healthcare-poor-rural-communities-china



Innovation number 3

Individual and community level asthma self-management: the Tonga Self-Management Programme A review of 36 randomised trials has shown that self-management can improve outcomes for patients with asthma. The Tonga Asthma Self-Management Programme encourages a greater degree of self-management than was involved with most of the trials included in the study. The programme aims to enable patients to manage their own condition with little or no clinical supervision.

At the beginning of the programme, patients attended a clinic and were given instruction on using peak expiratory flow (PEF) meters and recording the results. Patients were given a plan on how to manage their asthma according to their PEF rates. The plan involved two different self-assessment methods: the first was used in conjunction with the PEF rates, and the second according to symptoms. Guidelines were then provided on how to respond.

The programme was assessed in a before-and-after trial, with each patient serving as his or her own control. Patients used their self-management plan to manage their asthma medication or to obtain medical advice on their PEF rate and any presenting symptoms. The 110 participants in the study had moderate to severe asthma.

A total of 92 patients (84%) completed the 12-month programme. About two-thirds of them had had an emergency medical visit for asthma in the previous 12 months, but during the 12 months of the programme itself, just 18% had an emergency visit, with hospital admissions dropping from 19% to 3%. Patients having more than 14 days "out of action" fell from 40% to 13%, and severe asthma attacks fell from 54% to 18%.

For further information: reference9

Innovation number 4

The polypill

The concept behind the polypill, which has emerged in the past ten years, is that of combining into one pill several drugs that work in different ways to reduce heart attack and stroke. 10 The paper that introduced the word "polypill" suggested combining three drugs to reduce blood pressure all at half dose to achieve 80% of the benefit and just 20% of side-effects; a statin to reduce blood lipids, aspirin to reduce the "stickiness" of blood, and folic acid, which some researchers believe will reduce the risk of a heart attack and stroke. 11 All the drugs work in different ways, so their effect is additive.

The original paper advocated offering the polypill to everybody when they reached age 55, and without any testing or monitoring. The claim was that by taking the polypill, people would reduce their chance of developing a heart attack or stroke by 80%.¹¹ Importantly. all the drugs are off-patent, so polypills can be manufactured for a few dollars per month's supply.

Six companies, three in India and one each in Iran, Spain and the US, have now manufactured different polypills, and a series of trials have confirmed that polypills will reduce blood pressure, blood lipids, and platelet stickiness. The trials suggest that polypills will prevent heart attacks and stroke, though perhaps by 50-60% rather than 80%.¹⁰

Agreement is mounting that polypills may be useful in secondary prevention, that is in people known to have CVD already, but there is less agreement about using them in primary prevention that is, in people known to be at risk of CVD. A major trial is underway in India to test the efficacy of the polypill in primary prevention. As for the concept of offering the pill to everybody at 55 without testing and monitoring, so that health workers needn't be involved, that is more controversial still. But the concept does have a logical basis, in that many of the people who have heart attacks or stroke have not been identified as either having CVD already or being at risk.

Polypills are available in India, but do not yet have a licence in any developed country. However, it's possible that a licence for secondary prevention will be granted in the US and Europe within the next couple of years.

Interestingly, similar polypills, combinations in one pill of drugs that are off patent and work in different ways, might be developed for other conditions, including depression, asthma, COPD, and diabetes, and for facilitating smoking cessation.

Innovation number 5

Partnership in managing chronic conditions through technology: Collaborhythm, MIT Media Lab's New Medicine Group, Massachusetts Institute of Technology, US The doctor-patient relationship has been largely paternalistic. But with consumer empowerment, changing patterns of disease, rising costs, and ubiquitous technology, this relationship needs to change.

CollaboRhythm is a speech and touch-controlled collaborative interface where doctor and patient make shared decisions. Patients engage with their data so that they can take action in their lives, and self-manage in partnership with their doctors, who act more as coaches and navigators.

Importantly, patients own their own data in CollaboRhythm: everything they see in the doctor's office is available at home, or when they visit another doctor, or when travelling. Equally, patients can contribute data of their own – for example, their perceptions about social support, diet and alternative therapies.

CollaboRhythm is not a tele-presence system – it doesn't beam the doctor into the patient's life – but a system for tele-collaboration. The idea is that continuous monitoring helps patients to live a healthier life, making them less likely to need more intensive therapy. An earlier model of the innovation was used as a way to encourage and monitor medication adherence by people with HIV infection.

The New Medicine Group at MIT is looking ahead to developments such as doctors' sending out medication reminders to patients' bathroom mirrors or television sets. Patients can interact with intelligent conversational agents before visiting doctors. Doctors can send patients visualisations of their progress, presenting details in a form that is understandable and actionable by the patient.

The underlying premise of Collaborhythm is that patients cannot be expected to adhere to a medication schedule unless given reminders or encouragement. Patients and doctors make a joint decision to schedule medication and reminders. Originally the schedule was managed through a "Chumby" - an embedded computer device formerly made by Chumby Industries Inc., which provided Internet access via WiFi - though other interfaces are now used, and which reminds patients to take the medication and record it. Adherence data can be fed back to the clinician in real-time. Clinicians can send short videoclips to patients to view on their device. A pilot showed that patients were enthusiastic about the approach, and that most improved their adherence to medication.

Enabling patients to be active, informed participants in their own care is surely a valuable way of increasing quality, improving outcomes, and reducing cost.

For further information: http://newmed.media.mit.edu/

Innovation number 6

Social innovation to provide healthcare in remote areas: Community Health Actions in the Tapajos National Forest, Brazil This programme serves 1100 families living across 600,000 hectares in 143 rural settlements along the Tapajos River in the Amazon Basin. The area suffers from persistently high maternal and infant mortality and morbidity. The programme delivers interventions through a combination of community mobilisation and outreach. It links happiness to health, and is delivered through paid and volunteer staff, including health professionals, educators, community organisers, and specialists in social communication, employment and income generation. Central to the programme is a series of interventions to improve the living conditions of residents.

The programme combines three strategies. The first involves education, prevention and community mobilisation. Volunteers treat common ailments, give advice to families, and monitor community health. Education campaigns focus on family hygiene and sanitation. Hygiene and proper disposal of garbage are at the core of community participation. Local participation is encouraged through a circus – using happiness and health as its themes – games, theatre, dance, poetry, and various mass media.

The second strategy is that of providing access to safe water. The Tapajos River is contaminated. The programme gives financial and technical help to supply clean water, and local committees create and manage sewage-treatment facilities.



The third strategy involves a range of interventions supplying ambulatory prevention and community health services. Community-health agents use radios to alert medical personnel. An Ambuboat provides both emergency care and less urgent medical and dental treatment. A floating clinic provides clinical services and vaccinations. Each community has a Local Health Commission, comprising a person who prays for healing, a healer who uses medicinal plants, a bonesetter, and a traditional birth attendant. Traditional practitioners command respect among local residents, and are often the first to be consulted.

The annual cost per person is about \$70, but there are additional costs for sanitation and training. Costs are higher than for programmes located in more compact geographies. Thanks to the emphasis on popular participation, the programme has been developed and expanded across the region.

For further information: reference ¹² and http://www.cepal.org/publicaciones/xml/3/41593/social-innovation-public-policy-2010.pdf

Innovation number 7

Options for long-term care: The "Money Follows the Person" Rebalancing Demonstration Program (MFP) US This initiative is an attempt by the US Federal government to help individual States reduce their reliance on institutional settings for patients requiring long-term care. The programme is federally funded, and started in 2007. The aim of the demonstration programme is to develop services for people requiring long-term care, and to expand the options for the elderly and those with disabilities to receive care in the community. Through two sub-programmes, the initiative also aims at removing the barriers to a desirable use of Medicaid funds – namely, helping people to get out of residential settings and into the care setting of their choice.

One of these sub-programmes, the Transition Program, focuses on people institutionalised in nursing homes, hospitals, intermediate care centres for those with learning difficulties and institutions for those with mental disease. Participants have been in long-term care for at least 90 days. On the day the participants are transitioned, they receive a package of services based on home care and community care. They can hire their own caregivers, and can purchase support that enables them to live at home.

The other sub-programme, the Rebalancing Program, funds individual States to shift local long-term care requirements away from institutions; for example, through financing the costs of closing beds or facilities, expanding home- and community-based services, and providing affordable housing.

Programme evaluation shows that there has been a steady increase in participants. Despite some early setbacks, there is a powerful incentive to shift from a care model based on institutions to one based on people staying in the community.

For further information: http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Long-Term-Services-and-Support/Balancing/Money-Follows-the-Person.html

Innovation number 8

Primary Care 101: Knowledge Translation Unit, University of Cape Town, South Africa Primary Care 101 is a set of evidence-based, carefully designed guidelines that cover all the conditions likely to affect adults in primary-care clinics in South Africa. These clinics are staffed mainly by nurses who have considerable experience of treating patients with HIV infection but little training in managing patients with NCD and other conditions common in primary care. The nurses receive the guidelines to study and follow. Unlike most guidelines, these guidelines are symptom-based rather than disease-based.

The nurses also receive non-didactic, case-based training in their places of work, conducted by their own nurse managers, who have themselves been trained as educators for this purpose. This scheme represents a significant departure from the traditional model of in-service training for primary-care health workers. In that model, the training is intensive and didactic, and it is conducted off-site and hence out of context, with little attempt made to integrate it with the clinical setting.

The Knowledge Translation Unit of the University of Cape Town has already shown in a randomised trial that this double strategy – the use of guidelines and the onsite training of nurses – can improve the care of patients with respiratory conditions. ¹³ In a separate trial, the unit showed that when onsite non-didactic, case-based training was given to nurses who manage patients with HIV, their patients' received improved comprehensive care. ¹³ A third trial showed that the training approach improves the quality of HIV care in a particular context – namely, when responsibility for antiretroviral prescribing shifts from doctors to nurses; however, the training approach did not improve survival rates or accelerate initiation of antiretroviral treatment among patients on waiting lists. ¹⁴ The approach to in-service training of frontline staff has now been adopted by the South African Department of Health; and a similar, earlier approach for addressing HIV/AIDS and TB has been rolled out to more than 17,000 health workers in 1800 clinics across the country – a third of this roll-out took place in less than one year.

The double strategy – the use of the Primary Care 101 guidelines and the onsite training – is now being tested in a randomised controlled trial in the Western Cape, to see if it can improve the care of people with NCD.

For further information: http://www.knowledgetranslation.co.za/content/programmes_101.html

Innovation number 9

Using mhealth for point-ofcare testing: Swasthya Slate, India The Swasthya Slate (Health Tablet) interfaces physiological sensors and diagnostic equipment with an affordable tablet computer. The device contains software for patient records and decision-support systems for clinical services. Its main use is to screen and monitor for diabetes and CVD. The aim is to help the public health system to improve access, specifically by equipping healthcare workers with a single device that will allow them to deliver many services.

Research by the Swaystha Slate development team, conducted with rural doctors and healthcare practitioners, has shown that the real power of mobile-based health lies in point-of-care diagnostics. The tablet can, for example, measure heart rate and body temperature, and help to determine whether water is safe to drink.

In initial tests in rural Odisha, researchers found that the healthcare workers could learn how to use the system in less than five minutes. Technology and other innovations can usually be developed and diffused much more cheaply in low and middle-income countries than in high-income countries.

For further information: http://articles.timesofindia.indiatimes.com/2012-03-26/gadgets-special/31239575_1_ashas-device-software

Innovation number 10

Role of community-based, professionally supervised interventions to increase physical activity: Project GUIA, Brazil and other Latin American countries The US Centers for Disease Control and Prevention has funded a Guide for Useful Interventions for Physical Activity in Brazil and other Latin American countries, known as Project GUIA. The aim is to reduce obesity by identifying, evaluating and diffusing interventions that promote physical activity.

Brazil has recognised the priority of promoting physical activity, and many governmental organisations and NGOs work together to support research, practice and policy regarding the promotion of physical activity.

One example of such interventions is the Academia da Cidade Program or "city gyms" – a health-promotion policy focusing on physical activity, leisure and healthy eating. The Health Secretary of Recife first implemented the programme in 2002. The programme currently has approximately 30,000 participants in its 19 "polos" – the settings where the physical activity takes place, most commonly public parks.

Academia da Cidade holds physical activity classes in the community daily from 5.30am to 8.30am and from 5.00pm to 8.00pm. There is a range of aerobic and dance classes, organised jogging groups, and exercise and diet sessions for individuals with hypertension, obesity, diabetes, and CVD.



The project shows that physical activity among workers can indeed be increased by the availability of professionally supervised and publicly available physical activity sessions in community settings. Organisers should ensure that no groups are excluded. Programmes such as these can be scaled up nationally and internationally.

For further information: http://www.projectguia.org/en/index.html

http://www.projectguia.org/documents/research/100813/02 jpah Pratt Editorial 2.pdf

Innovation number 11

Incentivising people to be more healthy: Discovery Vitality, South Africa The South African insurance company Discovery, through its Vitality programme, has excelled in finding ways to incentivise people to live a healthier life. Those in the programme begin with a full health review, which assigns them a Vitality age and prescribes a pathway to better health – covering disease management, smoking issues, mental health, preventive health, nutrition, and physical activity. The Vitality age is an important innovation based firmly on scientific evidence and developed by the University of Cape Town: it is easy for patients to understand that to be assigned a Vitality age much higher than one's chronological age is clearly a bad thing, and that the reverse is clearly good.

Through following their prescribed pathway, participants can reduce their Vitality age and earn Vitality points. Actuarial analysis awards participants a status of platinum, gold, silver, bronze, or blue. By achieving their health goals, exercising, and eating healthily, people gain points, improve their status, and are rewarded with travel and cinema tickets and cash-back in some shops. People can also receive a 10% discount on healthy foods.

Participation in the programme is free for those who are insured with Discovery, and the payback for the company comes through reduced medical costs. Compared with those who are inactive, participants who are highly engaged with the programme are 10% less likely to be admitted to hospital, spend 25% less time in hospital when they are admitted, and have medical costs that are 16% lower.

The programme continues to evolve, and Discovery has partnered with several prestigious universities both to develop the programme and to evaluate it. Several studies have been published in peer-reviewed journals. 16,17,18

Innovation number 12

Programmes to prevent patients progressing from pre-diabetes to diabetes, and to improve management of patients with diabetes: UnitedHealth Group, US In a randomised trial in 2002, the original Diabetes Prevention Program showed that in patients with pre-diabetes, lifestyle changes could reduce conversion to diabetes by 58%. ¹⁹ That pilot programme was very expensive, however – it involved 16 sessions of one-on-one counselling – and was not rolled out.

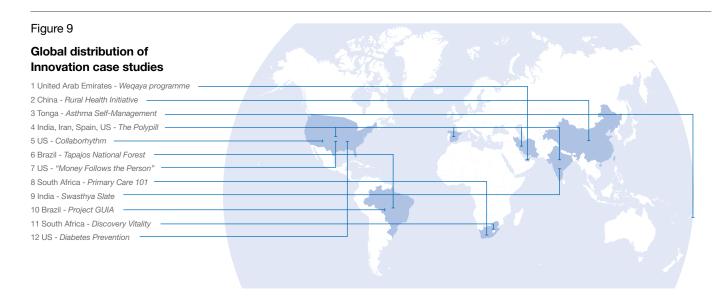
Together with the Centers for Disease Control, UnitedHealth Group has now created a scalable, affordable version of the programme, which produces savings within one year by reducing health costs. People at high risk of pre-diabetes are identified via analysis of claims and other data. They are then contacted and urged to attend a free test to see if they meet the criteria for pre-diabetes. If they do, they are urged to join a free 16-week group programme, run by the YMCA, that helps them lose weight, eat a healthier diet, and adopt a healthier lifestyle. Most people in the US live within easy reach of a YMCA, and the programme is paid for by UnitedHealth, other insurers, or employers. United is constantly experimenting with ways to incentivise people to go for testing, to stay in the programme, and to maintain weight loss and healthy lifestyles.

The group programme achieved much the same results as the earlier, individual programme had done, but at about a sixth of the cost per participant. So if the group programme is combined with the Diabetes Control Program, see below, the savings can be very considerable due to reduced health costs, and over three years the return on investment is approximately three to one.

Prevention programmes have also been tested in China, Finland, and India.

In many patients with type 2 diabetes, the disease is poorly controlled. But control of blood glucose, blood pressure, and serum lipids can reduce the complications of diabetes very substantially. Every percentage-point drop in HbA1c reduces the risk of complications by 40%, and every 10 mm Hg drop in systolic blood pressure reduces complications by 12%, Improved control of blood lipids can reduce cardiovascular complications by up to 50%.

In the Diabetes Control Program, patients with poorly controlled diabetes are again identified by analysis of claims and other data. The patients are then contacted, and with the consent of their physician they are urged to visit the local Walgreens pharmacy. There, specially trained pharmacists help the patients to monitor their diabetes, and discuss with them their medication and lifestyle. The pharmacies are typically located close to the patients and are trusted. The regular monitoring and support from the pharmacists reduce complication rates as compared with those of usual care, as shown in clinical trials.^{21,22} As with the group prevention programme, there is no cost to the patient, since the pharmacists are paid by United, other insurers, or employers.





Section three: Drivers and diffusion mechanisms of NCD innovations

Unless innovations to counter NCD are scaled across national systems, the systems will become unsustainable. In this section, we discuss how the drivers of diffusion can be used to scale-up innovations.

Figure 10

Drivers of Diffusion

Driver	Diffusion Mechanics
Professional	If innovations disrupt the way that professionals deliver a service or orthodox medical practice, then diffusion will be slow
discussion	Agreement is required on the framework of health-service delivery for this to work
Market	Markets drive innovations through industries – rapidly if value is proved; businesses that lag or resist will fail
economics	Markets work differently in health systems. Nevertheless, to become mainstream, innovations must prove value and savings. That requires developments in the payment system
Company	Consumer have a big role in scaling-up innovations – adopting those that make their lives easier
Consumers	Up to now, patients have not had a role in pulling innovations into health systems; this will change, as consumers now have raised expectations and increased awareness of innovations
Governments	Governments have a role to play in diffusing innovations – but they cannot compel adoption
Governments	They can control and shape diffusion by adjusting regulatory levers and by promoting quasi markets
International	Typically, a health system is a reflection of a nation's identity
organisations	But health, science and consumer behaviour are increasingly globalised, and disregard / transcend national boundaries. Sustainable and proven innovations will diffuse across countries
Businesses	Business is a major employer, and companies can influence the health of their staff
	Businesses sell products – which can be either good or bad for our health
	Businesses have relationships with consumers – which again can be either good or bad for our health

1 Professional discussion

Diffusing new services for patients with CVD – services such as the China Rural Health Initiative, Innovation 2, above – could prove very difficult in countries that have an existing national system of services. Community services led by non-physicians will be viewed as a challenge or threat by existing services, which are probably hospital-based. So if national diffusion is to occur, it will mean replacing some existing services – and that is not something that happens easily in established health systems.

Consider, for example, existing hospital-based services for patients with CVD. These services enjoy perhaps the highest status of all health services, and could feel affronted or threatened by the suggestion that community services led by non-physicians might be beneficial. So long as the community services remain local, clashes are avoidable. But to diffuse community-based services nationally, as the Chinese project nationally aims to do, then there needs to be a strategy that will address conflict to reassure, or convince or overcome the existing service providers.

The strategy must include a case for change that resonates with the public and, as far as possible, with clinicians too. The case for change must be scientifically based, and must show that the new service can indeed reduce mortality and morbidity and will also provide a return on investment. It is crucial to get some leading professionals to support the new approach, moreover it would be helpful to get patient groups to argue the case with those who provide the existing services.

Take the example of a better self-management initiative for patients with asthma, Innovation 3 above. Thousands of small-scale projects have been launched, all providing evidence that efficient self-management can transform patients' dependency on expensive healthcare resources, and can thereby increase the sustainability of health systems. But nearly all of these projects remain small-scale, and fail to challenge systematically the traditional services. One reason for this failure is that the projects radically challenge the role of the medical professional. So in the Tonga project, when patients learn to manage their own condition without medical assistance, they thereby reduce the role that medical staff have to play.

In such cases, some professionals will react defensively by questioning the safety of the new approach. That might undermine the confidence of patients to manage their own condition. So it is imperative to get some professional medical staff on board, who are prepared to argue against their colleagues, and in favour of the efficacy and safety of self-management. Ideally, such backing should come from the highest ranks of the profession – and not just nationally but internationally too. The Global Health Policy Forum might make a useful contribution in this regard.

2 Markets and the economics of healthcare pathways

The polypill, Innovation 4 above, would have greater economic success if it were manufactured from the beginning in large volumes for large populations. Large-scale production means lower unit cost and a better return on investment. It would therefore help the economics of the model if a social movement promoting the polypill concentrated on a country with a large at-risk population.

The polypill would contribute to developing a sustainable health system, because it would reduce the number of expensive interventions after heart attacks and strokes. If a third of heart attacks and strokes were prevented, say, the savings would be enormous. As with most of the other innovations, it is important to plough back some these savings; in the polypill case, some of the savings should be used to pay for polypill supplies, and thereby validate the business model. Again as with many other innovations, some form of financial investment vehicle should be created, which can release investment and recoup it after about a decade.

Consider again the example of better self-management, Innovation 3 above. The economics of improving self-management will work only if the savings that it can make – through reduced use of hospital beds, for example – are eventually realised. Increasing patients' capacity to self-manage needs upfront investment. In the Tonga asthma initiative, the setting up of the clinic and the education of the patients are not things that come free. They cost. An economic case for that investment must include a clear return.

In the Tonga project, emergency visits by the doctor fell from 66% in the previous 12 months to 18% in the 12 months of the programme. Hospital admissions fell from 19% to 3%. These improvements should result in resources being "saved" and so made available for other health activities. The trouble is that in many health systems, the resources that are "saved" are often in entirely different budgets from the investment. That means that the savings, even if they are realised, are not attributed to the investment.

Weqaya, Innovation 1 above, will save some resources in a short time, and the longer-term savings will be very substantial. People who are diagnosed as sick or at risk will incur costs, but those costs would have been higher if the diagnosis had occurred later. Both diabetes and CVD are much cheaper to treat before complications arise, and many of the complications can be prevented. Since this innovation is positioned within the health system in Abu Dhabi, it turns out that the savings are realised by the same organisation that made the investment. But it could have been different. Other countries that want to introduce the innovation should ensure that the savings can be made within the same organisation that makes the initial investment.



For those nations with public health insurance, the incentive to improve healthy behaviour is the same, but policymakers must monitor the way that the incentives work. Drivers are much sharper in the private than in the public sector. They might need to develop direct financial instruments, such as Social Investment Bonds, that can ensure a return on investment over time.

The Partnership in managing chronic conditions through technology Innovation 5, above, demonstrates that most health systems ignore or underplay the idea of developing new forms of two-way communication between patient and medical staff beyond the traditional face-to-face consultation. Wide diffusion of communication through mobile phones is mainly being developed outside of the normal payment systems. If the innovation displaces a reimbursement – for example, for face-to-face consultation – it represents not just a challenge to orthodox methods but also a loss of income for practitioners of that method. So it is important to develop an economic package around the use of mobile phones for healthcare purposes as a part of routine communication. This then needs to become as conventional a part of healthcare communication as the face-to-face consultation.

Communications via mobile phone or other electronic means will never entirely replace the face-to-face consultation, but over time they will greatly increase their share of diagnosis and treatment advice. Payments for such services will change in parallel, further demonstrating how disruptive mobile communications are within the health system.

3 Consumers

Traditionally, healthcare is not driven by consumer demand to the same extent as other activities are. That might be changing. Better self-management offers people with NCD much greater control over their lives, less reliance on medical interventions, and reduced morbidity – so patients are bound to want more of it. There is evidence that some patient groups, notably in the UK with the Richmond Group of Charities, are organising patients to demand much more self-management.

None of these patient groups, nor any of the innovators promoting self-management, are suggesting that patients can manage their conditions without some professional support. Good professional care that invests in the capacity of patients to self manage will improve the value that is derived from those professionals, but it does not mean that the professionals are not needed.

Innovations using mobile phones are eminently scalable, for the reason that these devices are so ubiquitous; and in many cultures mobile communications are now a normal part of life. Innovations that use mobile-phone technology to facilitate diagnosis or treatment should be able to diffuse easily and rapidly. Patient groups that represent people with NCD would welcome the increased convenience, and would ensure strong consumer demand for the innovations.

If the polypill meets resistance because it disrupts existing healthcare business models, then it might take an international clinical and social movement to establish the pill's legitimacy. The argument will have to be made in different parts of health systems; a wide range of champions might have to be mobilised, including various patient groups, people from different age groups, clinicians and scientists

Given the polypill's success in preventing heart attacks and strokes, the movement should start with the corresponding patient groups. In some parts of the high-income world, the prescribing of preventive drugs has proved successful – witness statins – and the advocacy of patient groups certainly contributed to the trend. Given that the polypill has most benefit for those over 55, this age group should be well-represented in the social movement.

The development of a social movement can help innovations in two ways. First, it can argue with existing healthcare business models, and from the plausible perspective a large patient population. Second, a social movement can develop demand, allowing the innovation to avoid expensive marketing campaigns.

In addition to strong clinical and value-for-money arguments, the social movement will need specific arguments to address the following issues:

- Problems will arise in countries with strong regulations. A polypill is essentially a combination
 drug, which means that the generic companies that manufacture the pills have to present
 an atypical case for regulatory approval. In most regulatory environments, that could involve
 considerable time and effort, which is why the pressure of a social movement would be so
 helpful. The movement should select a single high-profile national regulatory body to target,
 a way of starting the process.
- To a large extent, the current business model of large international pharmaceutical companies is one of high cost, high margin. The polypill represents a quite different model for health systems, and again might rely heavily on the social movement to help it win its case.
- Some public-health professionals fear that easy medication has certain drawbacks.
 For example, it might reduce incentives for people to adopt a healthier lifestyle; and mass medicalisation may undermine the essential health message. To argue against such views, the social movement should choose various relevant population groups as spokesmen.

If the China Rural Health Initiative, Innovation 2 above, is going to scale up, the public needs to be convinced that this intervention will reduce their chances of developing CVD – and that that would be a good thing. The worry is that people in some communities might even think it natural to develop CVD, and so would have little interest in engaging with any initiative that could stop the disease.

Therefore strong communities with strong leadership can convince the public and individuals that CVD is not natural and that there will be benefits from adopting the innovation. That was one of the main success factors when the campaign was launched in Northern China: once high-status village leaders were won round, the buy-in among the remaining villagers would follow. In most parts of the world, similar mechanisms will likewise facilitate the diffusion of an innovation.

Diffusion might fail if the innovation appears to be imposed from outside. When the salt-reduction and health-promotion part of the project in China was delivered by "community health educators", these educators strove to represent themselves as part of the community leadership rather than as external agents.

Diffusion might also fail if the innovation is insufficiently promoted at local level. Promoters must not assume that a national programme will gain the same support from community leaders as a successful local programme. Rather, they must put in just as much work, if not more, to get the community leaders onside.

In other settings, where local communities are not so coordinated, the campaign will need the help of social marketing organisations to reach and organise consumers. Across the world, the private sector has used persuasive communications to change consumer behaviour, so in many countries there is now considerable expertise in social marketing. A national programme to change health behaviour might have to draw on such expertise. Governments or other national campaigners would be well-advised to partner with social marketing companies rather than to conduct the campaigns directly themselves.

Social marketing changes behaviour because precise messages reach targeted groups through specific channels of communication. This segmentation is especially useful when the innovation is highly-focused, as in the China case, at a high-risk group. For maximum impact, that group should be carefully understood to determine the optimal channel of communication and to tailor-make the health message. This specificity of message and communication channel is one of the reasons that social marketing is so useful in national campaigns aimed at changing health behaviour.



The self-management of NCD shows how patients can add value to their own healthcare. As a result of the internet's impact on society and subsequent business transaction methods, consumers now routinely add much more value to the economics of a service than they did a decade ago. Importantly, much of this change has been led by demand from consumers, who would, for example, rather book their own travel than use an agent, particularly if this lowers the price and provides a better user-experience.

Weqaya, Innovation 1, screens for ill health or the risk of it, and by enabling early intervention generates savings for individuals and for the nation. If other governments are to make the case for such universal screening, then they will probably need the active support of the relevant patients' organisations. Given that patients might mistrust their government's motives, it is essential that other health organisations should form a strong part of any universal programme. Of course, visible government support for a health policy is necessary, but it will probably not be sufficient condition unless supplemented by other voices from civil society.

4 Governments

The China Rural Health Initiative, Innovation 2, is not going to scale up successfully unless local and regional governments tackle the staffing problem. This project shows that if nations lack a network of existing services for patients with CVD, then staff needed to be developed through four different means: technical training for local primary healthcare workers to screen, classify, and manage high-risk patients; development of a simple case-management record system within local clinics; a digitised central database and performance feedback system for health workers; and a performance-based economic incentive for health workers.

These four themes raise logistical problems that need to be considered when attempting to diffuse a programme nationally. Are there enough primary-healthcare workers in every part of the nation? If not, what can replace them? Are there sufficient resources for the training to take place at a national level? Can the local clinics work with case-management and digital-performance mechanisms across the nation? Are there sufficient resources for the economic incentive scheme to be rolled out nationwide?

In addition, national diffusion policies should cater for local, regional and cultural differences. Do economic incentives work in the same way in every part of the nation? Will village health workers everywhere be prepared to work with high-risk patients only and not others at lower risk?

Then there's the matter of regulation. In many countries, the use of medical devices has been tightly regulated, which has been important for safety. But mobile communications have given rise to new forms of screening, diagnosis, self-management and therapy and these developments call for new forms of regulation.

Finally, the issue of health data. As with Weqaya, governments must always take the lead in implementing the screening of a whole population. This is the case with many universal health interventions, notably immunisation – after all, infectious diseases are or were a serious threat to the national population. To aid such work, governments need to collect the population's health data. However, in some countries, a different attitude is developing towards the ownership of personal health data, and people are questioning the need for universal collection of data. So for governments to succeed in scaling up universal interventions such as Weqaya, they will need to engage with their populations in a new way. They must argue strongly for the benefits of collecting universal data; guarantee much greater security over the data; respect personal privacy; and understand it is the individual who owns their data, with some form of social contract being agreed so people understand the benefits to be gained from commoditizing their personal information.

5 International organisations

Our work has shown that each national healthcare system has distinctive characteristics, and differs from every other system in important ways. As a consequence of these differences, failure is almost guaranteed for any initiative that attempts to carry out a simple transplant of an innovation from one national system to another. International organisations need to pay much more attention to these national differences when advocating diffusion across nations.

One prominent recent trend in international diffusion is the increasing number of innovations developed within low and middle-income countries but promising much greater value-for-money and sustainability within high-income countries. Consider the Swasthya Slate in India, Innovation 9 above – using mhealth for point-of-care testing – the prospect is this will greatly improve the sustainability of health systems in most high income countries too, perhaps even more than in India itself.

6 Businesses

For a company that insures its workforce against ill health, healthy behaviour among the workforce will obviously benefit the company as well as the individual workers. Similarly with insurance companies and their clients. The South African insurance company Discovery aims to improve the health of the public through direct incentives, Innovation 11. Improved health behaviour among those insured by the company reduces the company's costs. So the company is strongly motivated to ensure that the healthy behaviour actually takes place. When the incentives work, the insurer is encouraged to spread the programme to wider parts of the population. Accordingly, where health insurance companies are in competition over improving the value of health expenditure, health-inducing behaviour will spread.

Other businesses can work with public or private insurers to help induce healthy behaviours. Businesses can encourage these behaviours in their staff through employment activities and through organisational changes in the workplace. Some businesses can help to scale up healthy behaviour through their products and the ways they market them. Alliances across industries can increase incentives for healthy behaviour.

Section four: What needs to happen next?

The case is clear. Innovative interventions are central to counter the rising tide of NCD. To make an impact, innovations are to be effectively diffused. As the Foreword indicates, this report marks the beginning of a programme and not the end. One of the next steps is a set of planned activities that should happen between now and the 2013 Summit; and crucially, to be effective, beyond it to future Summits. Some of these activities will be the responsibility of the Global Health Policy Forum's NCD Working Group and Imperial College London, whilst others will require wider collaborations.

1. Build an improved databank of innovations for countering NCD

During the course of this work, we have compiled a list of over 200 NCD innovations that are under development, undergoing trials, or being implemented across the world. We will place this evidence online, where it will be free and publicly accessible. We will develop the databank by adding further innovations, concentrating on gaps we have identified. We will also add evidence on the effectiveness, value-for-money, and likely impact of the innovations, and we will exclude innovations that are unable to show impact and sustainability. This innovation databank should become a first-call resource for ideas and solutions to counter NCD.

In addition, we will develop the taxonomy that we have been using to categorise the innovations, and increase its usefulness.

2. Develop the business case for the prevention and self-management of NCD

There is a growing argument about how self-management adds value to healthcare systems. For self-management to be more widely diffused, the economic and business case must be made repeatedly in every nation. We will develop an economic and business vehicle to enable us to build, analyse, and disseminate innovations in prevention and self-management.



3. Work with a government to diffuse at least one innovation

Over the next year, we will partner with a selected government to pilot the diffusion of one of our identified innovations across a wider part of their country. Progress will be reported at the next Summit. There will be an evaluation, and we will draw out international lessons.

4. Work with finance and health ministers to make the health, economic, and business case for investment in innovation

At first sight, making the case for investment in innovations seems to be complex, but we believe that a simple framework can be developed from our intervention taxonomy to help cut through the complexity. This case for investment would represent an important first step towards adoption, but it may be necessary to develop new financial instruments to enable longer-term investment to take place. In some countries, the instrument could be a Social Investment Bond, while in others some similarly innovative instrument might be available or appropriate. Over the next year, we will seek to work with a selected nation's health and finance ministries, along with its private and voluntary sectors, to make this opportunity a reality: a genuinely whole-of-society approach. Such a demonstrator could encourage the production of a toolkit for other countries to use.

5. Create a social movement around one of the innovations

This report has strongly argued the benefits of developing a social movement; but such movements usually have a wider purpose and cannot be simply conjured up around a healthcare innovation. However, a movement where people want to gain more power over their lives could certainly include the prevention of the onset of NCD. Over the next year, we will identify and encourage the adoption of a real example of the way that social movements and sustainable health systems work together. This will be evaluated and our findings reported at future Summits.

6. Conduct specific work for innovations in areas of the taxonomy that require development

The taxonomy used for this report shows that some areas have much less innovation than others. While we do not pretend that we have captured all innovations, it is clear that, for instance, more work needs to be done to develop open health data systems that are both scalable and secure. Such systems will help with the monitoring and screening of NCD among the population, and with researching and evaluating interventions. We will seek to promote the development of such systems in partnership with health authorities. The systems will be evaluated.

7. Build a global collaboration to implement an intervention

In the last year, an increasing number of global and regional targets have been set for stemming the rise of NCD. Acknowledging the importance of these goals, we will augment a technology-based innovation, by building a collaboration to trial and implement this intervention, to tackle an NCD at the global level. The aim will be to have a measurable impact on an NCD, whether through a prevention, detection or self-management intervention, and regardless of type of country or region of the world.

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