



BUPA HEALTH PULSE 2010

CHRONIC DISEASE: AN INTERNATIONAL PERSPECTIVE

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CHRONIC DISEASE: AN INTERNATIONAL PERSPECTIVE

EVIDENCE FROM THE BUPA HEALTH PULSE 2010 INTERNATIONAL HEALTHCARE SURVEY

Julien Forder^a

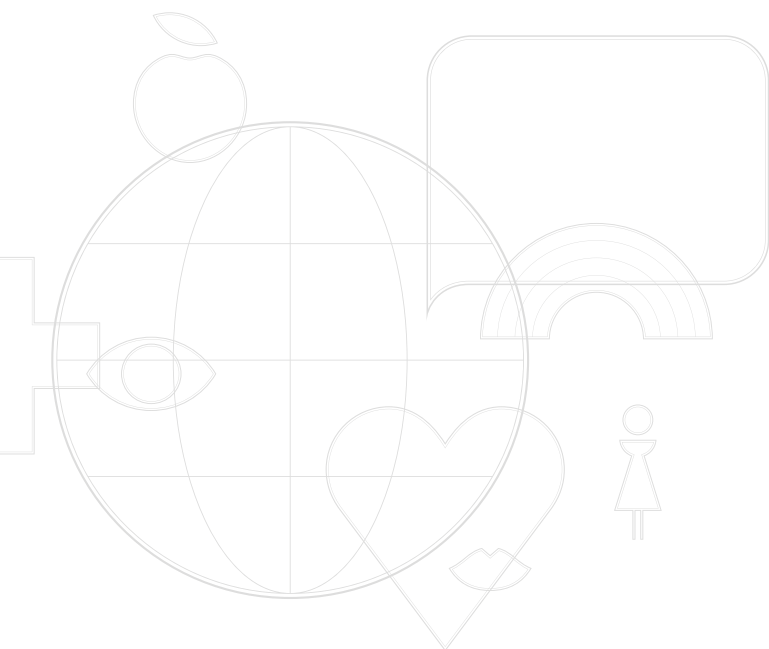
7 December 2010

www.bupa.com/chronicdisease

Bupa Health Pulse 2010 research:

- Ipsos MORI interviewed 12,262 people across 12 countries between 10 June and 14 July 2010
- Countries surveyed were: Australia, Brazil, China, France, Germany, India, Italy, Mexico, Russia, Spain, UK, and USA
- All interviews took place through Ipsos online panels and Ipsos panel partners
- Quotas were set as to be nationally representative by gender, age and region across all countries with the following exceptions:
 - Brazil, China, Mexico and Russia: the quota for age was set to be nationally representative up to the age of 50
 - India: quotas were set on age, gender and region to be representative of the online population
- Data are weighted

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EXECUTIVE SUMMARY

This report contextualises the findings of the Bupa Health Pulse 2010 international healthcare survey. The survey asked 12,262 people across the world for their views on key health issues in the broad areas of Ageing, Chronic Disease and Health & Wellbeing. Further information about the study can be found at www.bupa.com/healthpulse.

This report is the second in a series of three, looking at chronic disease in the 12 countries surveyed – Australia, Brazil, China, France, Germany, India, Italy, Mexico, Russia, Spain, UK, and USA.

Heart disease and diabetes are two significant chronic diseases that are given close scrutiny in the report – heart disease is the highest cause of death globally and diabetes is one of the fastest growing diseases.

The report is structured around three main areas:

- **Firstly, it compares people's perceptions of chronic disease with the scale of mortality and disability, particularly in relation to heart disease and diabetes.** The level of anxiety in each country was generally at odds with the relative scale of mortality from chronic disease.

People were more accurate in their perceptions of the relative seriousness of the main chronic diseases, although they tended to over-estimate the significance of cancer when heart and circulatory diseases are the leading cause of death in most countries.

Women were more likely to be concerned about heart disease and diabetes than men, but actually have a lower mortality risk.

Poorer and younger people tended to express the highest levels of concern about chronic disease compared with the population as a whole.

- **Secondly, it outlines the economic burden of chronic disease.** Despite the difficulties of attributing costs directly to specific conditions, the main messages are clear: The economic costs of heart disease and diabetes are very high. They include the costs of healthcare and the costs associated with loss of productivity.

- **Finally, it outlines some of the more recent and innovative approaches to tackling chronic illness.** Much of the burden of heart disease and diabetes can be attributed to lifestyle related risk factors such as poor diet, obesity, lack of exercise, smoking and excessive drinking. Prevention and management approaches aim to reduce these risk factors.

Public health promotion campaigns have played their part in reducing the risks, but recent developments in drug therapies, particularly statins, have also had a significant impact. For people with coronary heart disease, clinical procedures to restore blood flow have also been effective.

A key challenge is motivating people to change their lifestyles and adhere to their medication. A way of addressing this challenge is through self-management approaches that seek to educate patients and involve them in decisions through greater dialogue.

Although the evidence is still evolving, there are examples where self-management approaches have been found to be effective in improving patient experience, reducing healthcare costs and improving health outcomes. Using technologies such as the internet or telephone to deliver supported self-management programmes, shows promise.

Heart disease is the highest cause of death globally and diabetes is one of the fastest growing diseases



BUPA HEALTH PULSE 2010
SURVEYED MORE THAN
12,000 PEOPLE ACROSS
12 DIFFERENT COUNTRIES

1. INTRODUCTION

Chronic diseases such as heart disease, stroke, cancer, chronic respiratory diseases and diabetes are generally defined as diseases of long duration and slow progression. They are by far the leading causes of mortality in the world, representing 60 per cent of all deaths, or around 35 million people, according to the World Health Organization (WHO).^b

The Bupa Health Pulse 2010 study surveyed more than 12,000 people across 12 different countries to understand people's perceptions and behaviour in relation to chronic disease. This report focuses on heart disease and diabetes as two of the most significant chronic diseases, looking at how people's perceptions and understanding of these conditions compares with the reality as observed in the 12 countries. The report also considers the costs or economic burden of these diseases, and concludes with a discussion of some of the more important and innovative approaches to tackling chronic disease.



^b WHO, 2005. This is the most recent internationally comparable data available

2. QUANTIFYING THE PROBLEM

Death and disability

World Health Organization (WHO) data show that in high income countries most death is caused by chronic disease, whereas in low income countries infectious diseases are the greatest cause of death. Globally, heart and circulatory disease is the biggest killer, estimated to account for over a quarter of all deaths in high and middle income countries^c, and 15 per cent of deaths in low income countries. Even in high income countries, where cancer death rates are high (13 per cent), heart disease kills more than twice this number.⁴

In this report we concentrate on two of the most significant chronic diseases: heart and circulatory disease (or cardiovascular disease) as the largest cause of death, and diabetes as a condition with a rapidly growing number of sufferers – see **Box 1**. The WHO estimated that 17.1 million people died globally from all cardiovascular disease (CVD) in 2004, with this number of deaths expected to rise to almost 23.6 million by 2030 – an expected increase of 38 per cent.

Diabetes is also a leading cause of death. The WHO estimated that in 2005, 1.1 million people died from diabetes, noting also that this is likely to be an underestimate as diabetes-related deaths are often recorded as heart disease or kidney failure. In low income countries diabetes is often under-reported or left undiagnosed. If anything, diabetes deaths will increase even more rapidly than will deaths from cardiovascular

diseases (CVD). The International Diabetes Federation estimates that 285 million people (6.6 per cent of the global population) in 2010 have diabetes and this is projected to increase to 438 million people (7.8 per cent) by 2030.⁵

The other reason to focus on these diseases is because they are largely attributable to lifestyle-related risk factors. The WHO has compiled figures that illustrate how far lifestyle factors reduce the quality and quantity of life spent in good health. For example, the WHO estimated that if nobody were overweight or obese and people ate a sufficient amount of fruit and vegetables, the burden of coronary artery disease (CAD) would be reduced by a quarter, and the burden of diabetes by nearly 45 per cent. If there was no physical inactivity in the population, some 30 per cent of CAD and 27 per cent of diabetes would be avoided. Smoking⁶ is also associated with nearly 18 per cent of the burden of CAD and nearly 6 per cent of diabetes^d. In other words, much of the death and disability from each of these diseases is due to poor diet, lack of exercise, smoking and excessive drinking.

The level of concern and anxiety people have about chronic diseases will depend on a great many factors, but we would anticipate that the bigger the problem that these diseases are in a country (e.g. in terms of mortality and morbidity rates), the more that people will worry about them.

BOX 1: TWO KEY CHRONIC CONDITIONS

Cardiovascular disease

Cardiovascular diseases (CVD) are disorders of the heart and circulatory system and include a range of specific conditions. Coronary artery disease (CAD), which is often more specifically called ischemic heart disease, is the narrowing of the arteries to the heart. The other main cardiovascular disorder is cerebrovascular disease, the disease of the blood vessels supplying the brain, a major cause of stroke.

Diabetes

Diabetes mellitus is a chronic condition where, as a result of insulin deficiency or the impaired effectiveness of insulin or both, blood sugar levels are elevated beyond normal (known as hyperglycaemia). Chronically high levels of blood sugar (glucose) can cause diseases of the heart, kidneys, nerves, blood vessels and eyes, which can shorten lifespan and cause a significant reduction in quality of life. Extremely high levels can cause diabetic coma and death.¹⁻³ There are two types of diabetes. In type 1 diabetes there is an absolute deficiency of insulin (due to a failure of the pancreas to manufacture insulin). Type 1 is thought to be an auto-immune disease and its effects are felt from a young age. Type 2 diabetes, our main focus in this report, is usually characterised by a reduced ability of the hormone insulin to stimulate glucose uptake in body fat and muscles (insulin resistance) and affects most people suffering from diabetes. It can also occur from progressive loss of insulin production in the pancreas. As a progressive condition it more often affects older people.

^c As of 2004, the most recent fully internationally comparable data available

^d http://www.who.int/healthinfo/global_burden_disease/risk_factors/en/index.html

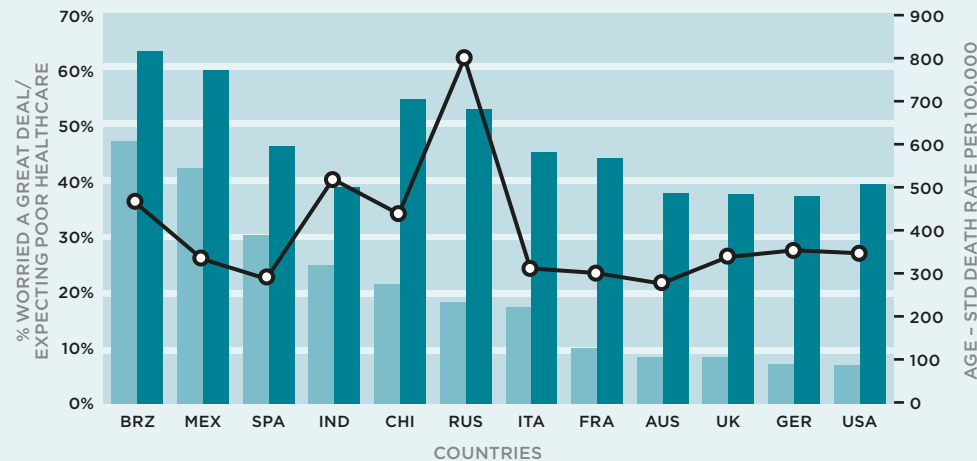


GLOBALLY, HEART AND
CIRCULATORY DISEASE
IS THE BIGGEST KILLER

2. QUANTIFYING THE PROBLEM

FIGURE 1

Perceptions of worry about chronic disease, 2010, various countries



KEY TO GRAPHS:

AUS (Australia)
BRZ (Brazil)
CHI (China)
FRA (France)
GER (Germany)
IND (India)
ITA (Italy)
MEX (Mexico)
RUS (Russia)
SPA (Spain)
UK (United Kingdom)
USA (United States of America)

■ WORRIED A GREAT DEAL (%)
■ EXPECTED POOR ACCESS TO HEALTHCARE
● CD MORTALITY

Source: Bupa Health Pulse 2010 and WHO⁷

An ability to obtain good healthcare was one of the key concerns for countries that were most concerned about getting a chronic disease

How accurate are we in assessing the risk of chronic disease?

The Bupa Health Pulse 2010 survey began by asking people, “How much, if at all, do you worry about getting a chronic disease?” **Figure 1** has the results, with countries ordered from left-to-right according to the percentage of people who were worried ‘a great deal’ about chronic disease. While 20 per cent of people were worried a great deal, 16 per cent were not worried at all, and the remainder reported intermediate degrees of worry. Also in **Figure 1** (the solid black line) is the actual mortality rates of the main chronic diseases (aged-standardised death rate per 100,000 of CVD, cancer, diabetes and dementia). This shows a poor correlation of 0.16 between people’s worry and national mortality rates.

We need to be careful in drawing conclusions from this quite general question about worry, but nevertheless we might have expected a stronger correlation. For some countries we do see a pattern of low chronic disease mortality rates being associated with low levels of worry, such as France, but not in others. In Spain, chronic disease mortality rates are low, but worry is much higher. One explanation might be that risk factors are low in Spain (compared with other countries) but prevention efforts have been effective at raising people’s awareness. In Russia, the opposite appears to apply; death rates are high but people are less concerned. This pattern might be explained by the lack of awareness-raising programmes or that people are more worried about other things in their lives.

In addition to looking at perceptions about anxiety, the survey asked if people had taken any action to address their risk of chronic disease, such as going to their GP for a check-up or eating more healthily. Overall, just over 30 per cent of the sample had not acted. A country by country interrogation shows that those countries that are least worried are most likely to have done nothing to address their risk, as we might expect.

Survey respondents were also asked what would worry them most if they had a chronic illness. An ability to obtain good healthcare was one of the key concerns for countries that were most concerned about getting a chronic disease.

An interesting result was that younger people were more likely to be worried about getting a chronic disease than older people; around 23 per cent of people aged 18-44 worried a great deal, with 18 per cent between 45 and 54, whilst only 14 per cent of people aged 55-64, and 12 per cent of people over 65 worried a great deal. This result is surprising as the incidence of chronic disease begins to increase during people's fourth decade of life.

The survey also suggested that a greater proportion of people on low incomes reported being worried a great deal (25 per cent) compared with those on medium (19 per cent) and higher incomes (17 per cent). This finding is in keeping with our expectations. There is good evidence that better off people are less likely to suffer the effects of chronic illness, for example, because they can afford better healthcare and/or access sporting facilities.⁸⁻¹⁰



2. QUANTIFYING THE PROBLEM

Across the whole survey, the greatest level of worry was about cancer followed by heart disease

How do we perceive the risks of different conditions?

The results of the Bupa Health Pulse 2010 survey suggest that people are not particularly aware or motivated by the risk of chronic disease in their country. But as general perception questions can be difficult to interpret, better insight may be gained by looking at how people view the risk associated with different chronic diseases. For example, the survey asked people to rank a range of conditions in order of how worried they were about them. **Figure 2** shows the proportion of people that ranked the listed condition in their top three of most worried-about conditions (the bars in the figure). Cancer was the most feared condition with around 45 per cent of people in the survey ranking cancer in their top three. This was followed by heart disease, with fewer people putting diabetes as significant. The figure also shows that more women than men put cancer in their top three, but there was no difference between the sexes on worry about heart disease and diabetes.

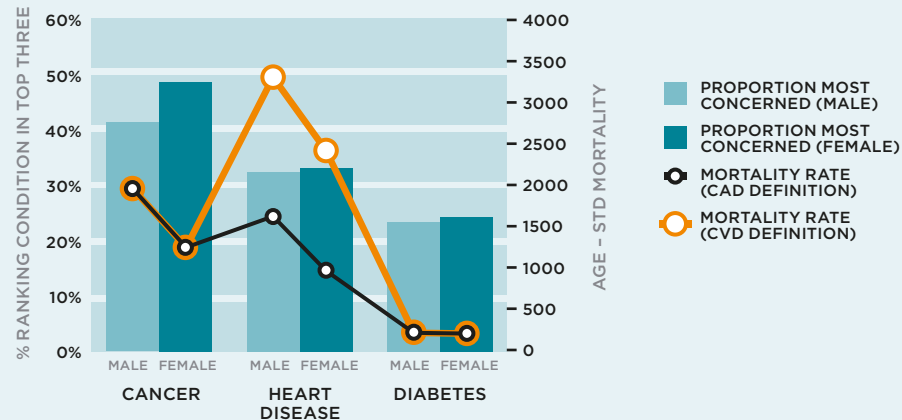
The lines on **Figure 2** indicate the mortality of disease, measured as age standardised mortality rate (deaths per 100,000). The orange line and the black line differ according to the definition of 'heart disease' we adopt to reflect the use of this term in the survey: if we use a more inclusive CVD definition (which includes stroke), then 'heart disease' mortality is greater than cancer mortality for both men and women (orange line). If we assume that 'heart disease' means just coronary artery disease, then the cancer mortality is greater (black line).

There was inconsistency between perceptions (worry) and actual mortality rates when comparing men and women. For cancer, women were more worried than men, when in fact, women have lower mortality. For heart disease, the sexes were equally worried but, again, the proportion of men killed by heart disease is greater than the proportion of women killed by this disease.

Across the whole survey, the greatest level of worry was about cancer, followed by heart disease. As **Figure 2** shows, this finding appears to be inconsistent with people's actual chance of dying from these diseases if we used CVD deaths as the definition of heart disease. We can speculate about the reason: a belief that cancer is the more random killer with less that can be done to prevent it; greater fear of the symptoms of cancer; a greater public awareness of cancer as a killer disease, and so on. Some of these fears might be justified but health education programmes should seek to make people more aware of the diseases which will have the greatest impact upon them, and the actions they can take. It should also be noted, that in five countries death and disability rates from cancer are higher than from CVD (Australia, France, Italy, Spain, and the UK). Also, if we use only CAD as the heart disease definition, then we do not see an inconsistency.

FIGURE 2

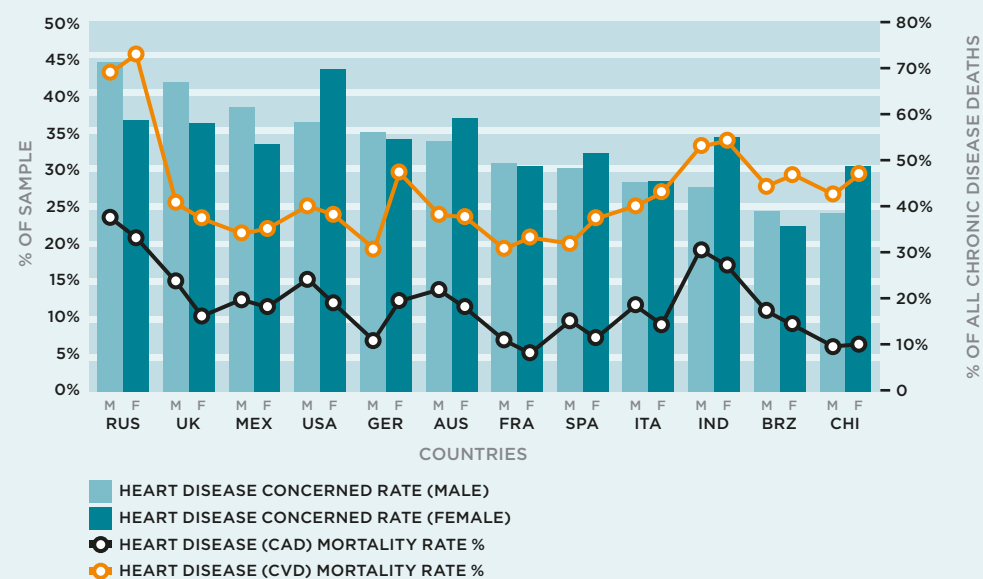
Level of worry about chronic conditions – Proportion ranking condition in the top three of the nine conditions



Source: Bupa Health Pulse 2010 and WHO⁷

FIGURE 3

Level of worry about heart disease – Proportion ranking condition in the top three of the nine conditions, by country



Source: Bupa Health Pulse 2010 and WHO⁷

People's ranking of the worry associated with specific conditions can be compared between the 12 countries.

Figure 3 shows the proportion of the sample that ranked heart disease in the top three conditions that were of most concern (the bars). In this way, people in Russia were most concerned about heart disease compared with other major chronic conditions than in any other of the survey countries. Of all major chronic conditions, people in Brazil were least concerned about heart disease. We can put these results in context by comparing them with the actual proportion of people who died from heart disease as compared with all chronic diseases deaths in each country (the lines).

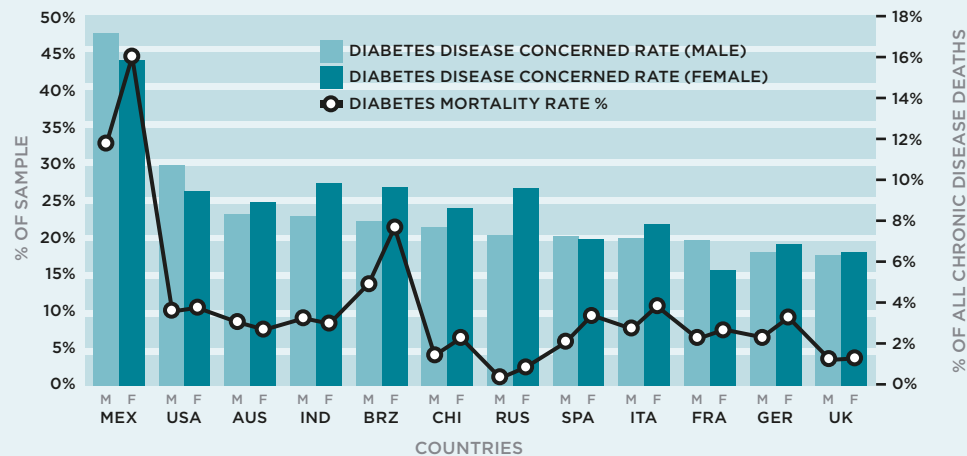
Overall, there is some correlation between the rate of people concerned and the proportion of actual deaths due to heart disease if we use a CAD definition (correlation = 0.49). When using a CVD definition of heart disease, there is very little correlation (0.16) between perceptions and reality of the disease. The results for India are particularly of note: heart disease accounts for a high proportion of chronic disease deaths (second only to Russia), but people from India are relatively unconcerned about heart disease among the 12 countries in the survey. Part of the reason for this is that India has very low death rates from cancer, the other major killer, which means that CAD deaths as a proportion of total chronic disease death is particularly high. We can also speculate that in India, health promotion programmes have not focused on raising the profile of heart disease.

The pattern of women having greater anxiety about heart disease but lower relative mortality from this disease is repeated for many of the individual countries in the survey.

2. QUANTIFYING THE PROBLEM

FIGURE 4

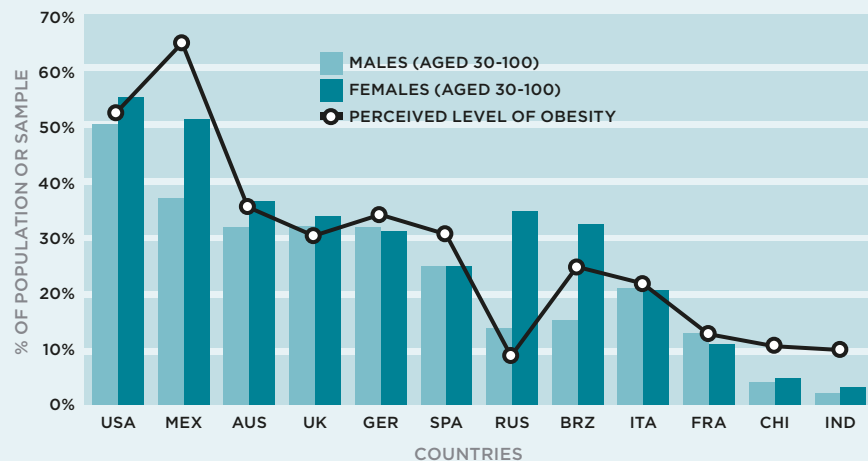
Level of worry about diabetes – Proportion ranking condition in the top three of the nine conditions, by country



Source: Bupa Health Pulse 2010 and WHO⁷

FIGURE 5

Obesity rates and perceptions of the numbers who are obese



Source: Bupa Health Pulse 2010 and WHO⁷

There is also a good correlation (0.85) between the proportion of survey respondents who ranked diabetes as a major concern and the proportion of deaths due to diabetes in that country. In Mexico, diabetes rates are high – a result that can be linked to high obesity rates in that country (see **Figure 4**) – and concern about diabetes is very high in that country compared with the others in the survey. Of the high income countries, diabetes is also high in the USA, again linked to obesity,¹¹ and again we see a high degree of concern. Interestingly, however, diabetes mortality is higher among women than men in ten of the 12 countries regardless of income.

Perceptions of obesity and incidence amongst men and women

Obesity was one of the options presented to people when asked what they felt was the most significant health issue in their country. The number of people selecting obesity as the most prevalent condition was closely correlated with the actual rates of obesity recorded; correlation of 0.89 ($p=0.0001$). Perceptions were more likely to track the male incidence of obesity. However, it is women who are more likely to be obese than men in every country except France, Germany and Italy. This is particularly the case in Russia, Brazil and Mexico.

Women are more likely to be obese than men in most countries



What can we learn from the analysis?

Chronic diseases are the main cause of death in most countries, save for those with the lowest national income. Over a quarter of all deaths in high and middle income countries are due to heart diseases, yet the overall level of concern people expressed about chronic disease in the survey did not relate well to the scale of the mortality from these conditions between countries. When asked about which of the main chronic diseases they were most worried about, people's perceptions did match more closely with the relative scale of mortality from these diseases between countries, although internationally, the risks of heart disease can be seen to be underestimated.

Internationally, people were more concerned about cancer, but deaths from heart disease (CVD) are higher. In addition, women have a lower mortality risk from heart disease and cancer than men, but, if anything, were slightly more likely to express the highest level of worry about these conditions. Women are also more likely to be obese than men in the countries reviewed, although perceptions about the scale of obesity appeared to track male obesity rate in many countries.

3. ECONOMIC IMPLICATIONS

TABLE 1
Economic costs associated with cardiovascular disease, 2006

	UK	FRA	GER	ITA	SPA
Total healthcare costs per year (€ 000s)	18,911,400	13,003,400	34,029,900	13,790,200	5,694,600
Percentage of total health expenditure	12%	7%	14%	10%	7%
Production loss due to mortality (€ 000s)	5,811,300	2,230,400	7,004,900	2,529,700	1,631,000
Production loss due to morbidity (€ 000s)	5,050,700	934,700	2,207,700	1,440,100	1,147,100
Cost of Informal care (€ 000s)	10,580,000	6,449,900	10,823,600	4,096,000	1,168,300

Source: <http://www.heartstats.org/temp/ESspweb08spchapter.12.pdf> (page 105 table 12.1)

The World Economic Forum's 2009 Global Risks Landscape report identified chronic diseases as one of the most significant risks facing the global economy, exceeded only by the risks posed by sudden oil/gas price rises, retrenchment from globalisation, asset price collapse and a slowing of the Chinese economy.^e

Chronic diseases incur healthcare costs in treatment and management of a person's condition. They also incur indirect costs to the economy that result from sufferers being less able to contribute economically and from the cost to family and other carers of providing informal care to people with these long-term conditions. Exact estimation of these costs is often difficult, but we can nonetheless get a good sense of the size of these costs. This analysis is important because it signals the potential economic benefits of strategies and interventions that lower rates of chronic disease.

Table 1 gives some estimates of economic costs of CVD as produced by the British Heart Foundation for various European countries. In these countries the direct healthcare costs vary between 7 per cent and 14 per cent of total healthcare expenditure. This wide variation might be explained by differences in the prevalence of CVD, the priority attached to addressing it in each country, and likely differences in classification and accounting in different countries.

The indirect costs of CVD are nearly as large as the direct costs. In England, estimates are that 5.6 per cent of the 16+ female population and 8.1 per cent of the 16+ male population had CAD or stroke in 2006, which is equivalent to 2.8 million people in England. Cost per sufferer would then be around €5,500 per year for the healthcare costs and nearly €12,000 per sufferer if we also include the indirect costs.

Reduction in CVD incidence would reduce these costs, reduce direct healthcare costs and also allow people to be more productive. Furthermore, effective policies to better manage CVD and reduce rates would improve people's quality of life (which also has value to people, and can be quantified)^f.

Diabetes also imposes a large economic burden on national healthcare systems. According to the International Diabetes Federation (IDF), healthcare expenditure on diabetes accounts for 11.6 per cent of the total healthcare expenditure in the world in 2010. The IDF estimates that global health expenditure to prevent and treat diabetes and its complications totalled at least 376 billion US dollars in 2010. By 2030, this number is projected to exceed some 490 billion US dollars – an increase of more than 30 per cent.

Table 2 presents the IDF's estimates of prevalence and mean healthcare expenditure per diabetes sufferer. Expenditure per capita varies significantly showing a clear divide between high income and lower income countries; it shows very little consistency with variation in prevalence rates in these countries. Healthcare expenditure per diabetic is similar or perhaps slightly lower than healthcare expenditure per capita for CVD sufferers in the UK.

Although the data are incomplete and specific estimates remain tentative, it is clear overall that CVD and diabetes impose a significant economic burden. The potential economic benefits of interventions that reduce the prevalence of these conditions are large, especially when we account for indirect costs, such as loss of productivity and the value of improvements in the quality of life if conditions are better managed.

^e http://www.weforum.org/pdf/globalrisk/globalrisks09/the_global.htm

^f For example, the National Institute for Health and Clinical Excellence (NICE) in the UK is understood to work on the basis that the value of an improvement in the quality of a person's life over one year from a state that is so bad that they are indifferent to being dead, to a state of full health is £30,000.



TABLE 2

Prevalence and healthcare expenditure per capita, diabetes, 2010

	POPULATION (000s)	PREVALENCE	MEAN EXPD PER DIABETIC (USD)
AUSTRALIA	15,128	7.2%	3,781
UK	44,056	4.9%	3,574
INDIA	713,498	7.1%	55
MEXICO	61,317	10.1%	708
SPAIN	33,944	8.7%	2,277
USA	217,335	12.3%	7,383
BRAZIL	126,326	6.0%	563
CHINA	964,302	4.5%	115
FRANCE	44,091	9.4%	4,141
GERMANY	62,654	12.0%	3,751
ITALY	44,510	8.8%	2,807
RUSSIA	107,184	9.0%	325

Source: <http://www.diabetesatlas.org/content/eur-data>

Global health expenditure to prevent and treat diabetes and its complications totalled at least 376 billion US dollars in 2010

A photograph of an older couple walking on a sandy beach at sunset. The man on the left is wearing a dark jacket and blue pants, smiling broadly. The woman on the right is wearing a white sweater, a patterned scarf, and a red bag, also smiling. They are holding hands. The background shows the ocean and a bright, hazy sky.

IF PEOPLE ADOPTED
LOWER RISK BEHAVIOUR,
HEART DISEASE AND
DIABETES WOULD
DROP SUBSTANTIALLY

4. ASSESSING APPROACHES TO MANAGING CHRONIC DISEASE

Strategies to combat disease in general combine prevention, management and treatment or cure. In theory, cures for chronic diseases might be relevant – for example, interventions that restore beta cell insulin secretion for diabetes (especially type 1) – but in most cases (at least given present state of medical understanding) strategies for chronic disease fall into the prevention and management category. The role of the individual is paramount.

Prevention and management are about reducing the risk factors for disease and illness. Preventative measures can be defined as:

- **Primary prevention** – aimed at people who are healthy, to promote the maintenance of a healthy lifestyle with respect to primary risk factors (e.g. diet, exercise, alcohol and smoking).
- **Secondary prevention** – efforts focus on people with an elevated risk of chronic illness, as indicated by family history, older age, indications through routine screening (e.g. being overweight, elevated cholesterol, high blood pressure, high blood sugar) or other markers. Secondary prevention measures include efforts to reduce not only primary risk factors, but also intermediate risk factors; that is, to reduce blood pressure, cholesterol and so on.
- **Tertiary prevention** is management of people with a chronic condition. In this case more aggressive strategies might be employed, with the aim of tackling intermediate risk factors.

The role of the individual is paramount

According to WHO estimates, if people adopted lower risk behaviour, such as no smoking and regular exercise, heart disease and diabetes deaths would drop substantially. **Table 3** lists population attributable risk as calculated by the WHO for CAD and diabetes⁶. The percentages in the table are estimates of the reduction in the burden of disease that would occur if exposure to the listed risk factors were reduced to ideal levels. For example, if smoking was reduced to zero then just under 18 per cent of life years lost (from premature death) or years spent with disability as a result of the coronary artery disease would be avoided. This sum of years lost plus disabled years are called disability-adjusted life years or DALYs⁹. Another example is if everyone in the population was to take sufficient exercise, around a third of life years lost or years spent with disability (DALYs) would be avoided. In practice, behavioural change on this scale is unlikely even with the most effective preventative approaches, but these estimates serve to highlight that even changing the behaviour of part of the at-risk population would lead to significant improvements.

⁹ Originally developed by the World Health Organization, the disability-adjusted life year (DALY) is a measure of overall disease burden and is the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.

4. ASSESSING APPROACHES TO MANAGING CHRONIC DISEASE

TABLE 3

Population attributable risk –
Percentage of total disability-adjusted life years lost (DALYs)

	ISCHAEMIC HEART DISEASE/CAD			DIABETES MELLITUS		
	MEN	WOMEN	TOTAL	MEN	WOMEN	TOTAL
PRIMARY FACTORS						
Overweight and obesity	22.8	23.3	23.0	40.4	47.2	44.1
Low fruit and vegetable intake	12.1	12.9	12.4			
Physical inactivity	30.3	30.4	30.4	26.1	27.0	26.6
Tobacco use	24.8	7.3	17.7	8.1	3.7	5.7
Alcohol use	5.1		5.1			
Urban outdoor air pollution	3.9	3.9	3.9			
INTERMEDIATE FACTORS						
High blood pressure	39.2	41.3	40.1			
High cholesterol	41.2	40.5	40.9			
High blood glucose	22.7	22.4	22.6	100.0	100.0	100.0

Source: WHO⁶ and http://www.who.int/healthinfo/global_burden_disease/risk_factors/en/index.html

The underlying risks or causes of chronic disease are complicated and multi-faceted. **Table 3** distinguishes between ‘primary’ factors and ‘intermediate’ factors, where the latter are in part caused by the former. For example, 100 per cent of diabetes is due to high blood glucose (by definition); if blood glucose levels were returned to normal, diabetes would be eradicated. A major cause of high blood glucose is obesity, and also poor exercise, smoking, and a range of other factors. If there was no obesity in the population, then nearly half of diabetes disability and mortality would be prevented. These primary risk factors can, in turn, be influenced by a range of context factors, such as education, economic situation, environment, culture and so on. In this section of the report, we see how prevention measures are aimed at these different levels of causal factors. Because the factors in the table have multiple causes the effects should not be read as mutually exclusive (they should not be added up). For example, improved fruit or vegetable intake will often be linked to reduced obesity. If both were achieved, CAD burden would fall by over 23 per cent but not as much as 35.4 per cent.

The challenge is to inspire people to change their behaviour to help reduce primary risk factors in the at-risk population. A multi-faceted approach would combine these measures with interventions developed to address intermediate factors, such as drugs to reduce blood pressure and/or procedures to restore blood flow.

If there was no obesity in the population, then nearly half of diabetes disability and mortality would be prevented

In this brief overview, we will concentrate on some of the latest innovations where the issue of motivating people to change their behaviour is at the forefront. Before doing so, to give some context, we should note that there have been a range of measures, mainly falling into the primary and secondary prevention category, which have sought to educate people about risk factors across the whole population. These health promotion and public health measures have included, for example, anti-smoking campaigns, bans on smoking in public places¹², bans on advertising of poor nutrition foods, taxation on alcohol and tobacco, and attempts to promote more exercise by consideration to the built environment (e.g. more walking or cycling friendly urban planning)¹³. There is some evidence that these policies have been effective. In particular, warning labels on cigarette packs, and ‘information shock’ reports have been effective at reducing smoking rates^{14 15}.

Clinical and pharmacological interventions

Over the last two decades there have been significant advances in drug therapies to help people who have a high risk of heart disease and diabetes. These therapies should be seen as part of secondary and tertiary prevention measures. The use of statins amongst people with heart disease, to lower cholesterol/lipids has increased dramatically in recent years¹⁶. These drugs, as well as anticoagulants (e.g. aspirin) and blood pressure medicines (e.g. beta blockers, ACE inhibitors, calcium channel blockers) are now standard elements of (secondary and tertiary) prevention recommendations for heart disease risk.^{17,18} The use of statins has been shown to be effective and safe. An important, large-scale review of 14 trials found that low-density lipoprotein (LDL) cholesterol was reduced by just over 1 mmol/L and that 5-year incidence of major coronary events, and stroke was lowered by about one fifth per mmol/L reduction in LDL cholesterol¹⁹. These interventions are best used in conjunction with efforts to change lifestyle, especially smoking cessation, increased physical activity and diet change. Cardiac rehabilitation programmes of this nature have been shown to be cost-effective²⁰.

The use of clinical procedures to restore blood flow has also increased rapidly in the last two decades. Angioplasty rates have more than quadrupled in many countries since the early 1990s²¹. To restore blood flow, angioplasty involves passing a catheter through the arteries towards the narrowed sections where a small

balloon at the tip of the catheter can be inflated to widen the artery. Another standard 'revascularisation' procedure is coronary artery bypass grafting where a vein section is crafted on to the artery to divert blood flow around the blockage. Research in the early 1990s and before had established that these procedures were effective at reducing mortality and morbidity risk²². They are considered important elements of a (tertiary) prevention strategy to reduce the chance of cardiac events.

Risk factors for diabetes tend to follow the same pattern as CVD, although with more emphasis on diet. Treatment for type 2 diabetes mellitus revolves around controlling the patient's level of blood sugar. Patients with poor glycaemic (blood sugar) control^h are significantly more likely to suffer 'microvascular' complications i.e. kidney disease, nerve damage and eye disease, and possibly also an elevated risk of heart attack¹. Diabetes is also an independent risk factor for CVD. There is some evidence that the use of statins for people with diabetes who are at sufficiently high risk of vascular problems leads to fewer cardiac events and reduced mortality²³.

Initial treatment of patients with type 2 diabetes mellitus should be in the form of diet and education². A recent Cochrane Review found evidence for diet change and diet change with exercise, but not exercise on its own²⁴. If non-pharmacological measures are insufficient, perhaps because the patient is unable or unwilling to make sufficient lifestyle changes,

THESE INTERVENTIONS
ARE BEST USED
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CHANGE LIFESTYLE

additional therapy with oral hypoglycaemic agents can be used. A number of these drugs seek to encourage natural insulin production and therefore appear well placed to help people with type 2 diabetes. The evidence about the effectiveness of these drugs is somewhat mixed^{2,25}. Where these oral drugs are not effective, patients will need insulin. Improvements to the refinement of insulin have reduced side effects but the regime of daily injections (insulin cannot be administered orally), self-monitoring of blood sugar, episodes of hypoglycaemia and regular contact with health services can all reduce quality of life. As such, efforts to improve primary preventionⁱ are especially important.

^h Indicated by an HbA1c score of greater than 7 per cent.

ⁱ without the need for drugs.

4. ASSESSING APPROACHES TO MANAGING CHRONIC DISEASE

Self-management and the role of the individual

The evidence shows that lifestyle-related 'primary' risk factors have a large impact on rates of heart disease and diabetes. Furthermore, if people adhere to their drug regime then statins, blood-pressure medicines and anticoagulants can be effective at reducing intermediate risk factors. And yet disease rates are high and even growing in many countries, particularly diabetes rates.

An important challenge is to motivate people to change their behaviour and/or to manage their condition, both in a practical and emotional sense²⁶. The traditional medical model assumes that patients are not sufficiently able to understand the complexities of their condition and therefore should, more or less passively, accept the decisions of healthcare professionals. The self-managed or patient-centred approach challenges this model and there is evidence that greater patient participation improves outcomes. It primarily involves an investment in specific-patient education, a greater dialogue between the health professional and the patient, health coaching and self-care²⁷.

Patient education about their disease, its progression and possible treatment is necessary if people are to manage the risks associated with their condition. A review (meta-analysis) of 37 studies of the effects of health education and stress management programmes for coronary heart disease patients concluded that death rates were reduced and risk factors improved²⁸. Nevertheless, information provision alone will not achieve the best outcome improvements if some people do not act on the information provided; people also need to overcome the barriers to putting advice into practice²⁹. This argument was supported in studies of heart disease³⁰, diabetes³¹ and rheumatoid arthritis³². Exercise is central to cardiac rehabilitation programmes, but studies have found that non-adherence to exercise plans is a problem, with patients citing a lack of motivation³³.

Shared decision-making (SDM) is the process whereby patients are involved in partnership with clinicians to both determine the medical options available and in choosing the preferred course of action³⁴. SDM can help patients with chronic conditions, such as diabetes, to be involved in clinical decisions about their health and care, delivering treatment outcomes that much more closely match their expectations and preferences³⁵. This approach works by allowing better understanding of patients' beliefs, their preferences, and the barriers they face^{26 30}.

Shared decision-making is the process whereby patients are involved in choosing the preferred course of action

Shared decision-making can be facilitated by giving patients decision support aids, such as printed material, audio or videos outlining treatment options. The findings from a Cochrane review of 55 randomised trials addressing 23 different screening and treatment decisions highlighted that providing decision aids alone without any support to patients does not produce the most effective outcomes³⁶. It highlighted several conditions necessary for successful implementation of SDM: i) good quality decision aids are needed to meet the needs of the local population, ii) healthcare professionals must be supportive of distributing decision aids within their practice and iii) effective systems for delivering decision support must be in place.

As well as information sharing, dialogue between patient and doctor, and health coaching, the self-management approach can also involve patients directly in their care; for example, patients who self-monitor their condition have been shown to have better outcomes³⁷. A key component of the approach is the focus on achieving behavioural change, often using psychological theory.

There are a number of ways that self-management programmes can be delivered: specially designed programmes delivered by healthcare professionals or lay leaders; by health professionals supporting self-management; and through interactive technology such as the internet or telephone³⁸. The professional's role in supporting patients in this approach should conform to the '5 a's': *assess* the patient's preference, health, readiness for change; *advise* patients on their health risks and management options; *agree* goals and a treatment plan; *assist* in addressing barriers and increasing a patient's motivation; and *arrange* with the patient the assistance and support determined in the care plan³⁸.



4. ASSESSING APPROACHES TO MANAGING CHRONIC DISEASE



Using information and communication technologies

Improvements in information and communication technologies facilitate remote delivery of self-management support. Provision of information about a person's condition, advice, coaching and so on can be provided over the telephone or via the internet. Going further, technology can be used to allow remote telemonitoring of the patient's condition, to further refine and personalise the information and advice provided to patients. There are also potential cost savings compared with conventional face-to-face arrangements stemming, not least, from reduced travel costs, infrastructure needs and savings on people's time. Additional costs would also be incurred, for example, in procuring and installing the equipment and training people on its use. A number of studies have shown that remote technology methods do not lead to worse outcomes than clinic-based self-management support, and better outcomes than people receiving the usual care (i.e. not dedicated self-management). An important example is of the Stanford Chronic Disease Self-Management Programme (CDSMP) – a small group support programme found to be effective in changing health-related behaviour and improving health statuses – that was subsequently modified to be delivered over the internet. After one year, the internet intervention group had significant improvements in health statuses compared with usual care control patients. The intervention group had similar results to the small group (face-to-face) CDSMP participants³⁹.

A review of studies into whether remote monitoring (health coaching or telemonitoring) without regular clinic or home visits improves outcomes for patients with chronic heart failure, concluded that such programmes with remote monitoring have a positive effect on clinical outcomes on patients living in the community⁴⁰. In a recent (non-systematic) review, Lorig and colleagues summarised that internet-based educational programmes have been demonstrated to change behaviours and sometimes health status⁴¹. In their own trial of people with type 2 diabetes using an online diabetes self-management programme compared with usual care control subjects, the authors concluded that an online diabetes self-management programme is acceptable for people with type 2 diabetes.

A randomised trial of telephone self-management support (coaching) that looked at costs of service use for a large study group of people including those with chronic diseases, such as heart failure and diabetes, found that healthcare utilisation was reduced in the intervention group by just over 8 US dollars per person per month⁴².

Progress with implementation of self-management approaches is mixed – see **Figure 6**. Self-management plans are more prevalent for diabetes (in the countries surveyed), reflecting the close relationship between diabetes and the (avoidable) risk of obesity. We can also conclude that the care-management approach is more established in the USA than the other countries⁴³.

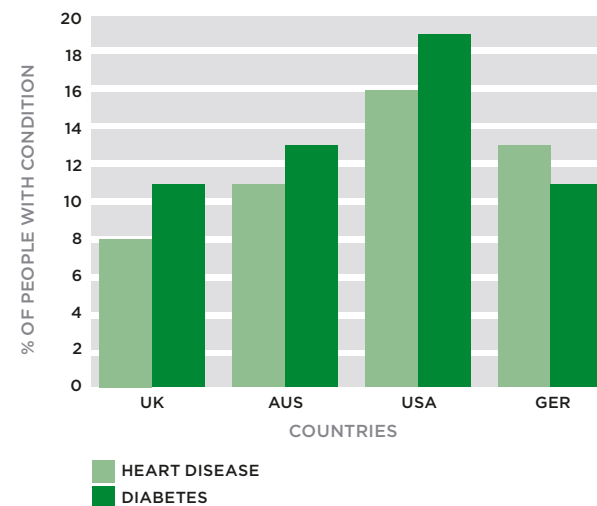
The role of health services

The configuration of health services, especially between the hospital and primary care/general practice sectors, is relevant to the management of chronic illness. A number of commentators have argued that greater integration between these sectors would appear to be advantageous in order for the system to best respond to people's changing conditions, but that the evidence base is limited⁴⁴. Others point to potential innovation in support for people with long-term conditions by having a more integrated care system with a strong orientation to primary care and with a single point of access to the health system⁴⁵.

Providers can also be given incentives to better focus their efforts on prevention. The quality and outcomes framework (QOF) used in the reimbursement of GPs in England specially rewards GPs for a range of chronic disease-oriented activities, ranging from monitoring to advice and guidance. Early evidence suggests that the rate of improvement in care for people with chronic conditions – CAD, asthma and diabetes – improved more quickly after the implement of the QOF payment-for-performance system⁴⁶. This finding was supported in a study looking at the effects of QOF on blood sugar control⁴⁷. A study of payment-for-performance programmes in California did not, however, find evidence that these incentives led to an improvement in outcomes⁴⁸. These results suggest that the design and context of payment-for-performance is important for programmes to be effective.

FIGURE 6

Provision of a self-management plan, proportion of patients, 2005



Source: Coulter⁴³

5. CONCLUSIONS

Chronic disease affects a great many people and is the leading cause of death and disability globally. The Bupa Health Pulse 2010 survey sought to gauge people's perceptions and beliefs about chronic disease, and this report compares these views with actual disease patterns and trends in the 12 countries covered by the survey. There was little correlation between overall worry about chronic disease and the level of chronic disease mortality across the 12 countries. When people were asked to rank the diseases they were most worried about getting in order of concern, worry was more closely related to the proportion of chronic disease deaths from these conditions. Furthermore, although women have a lower mortality risk from heart disease and cancer, they were more likely to express the highest level of worry about these conditions.

The extent of many chronic diseases, like heart disease and diabetes, could be significantly reduced if risk factors such as smoking, obesity, excess alcohol, diet and lack of exercise were tackled

The survey supported expectations that people living in poorer countries tend to be more anxious than those in richer countries, perhaps reflected by the former's poorer access to healthcare. Bupa Health Pulse 2010 found that in many countries people were most worried about cancer, although in fact, heart disease (CVD) is the leading cause of death and disability globally and in the countries surveyed.

In terms of observations around gender, women were more likely to be obese than men in the countries reviewed even though perceptions about the scale of obesity tracked the male obesity rate in many countries.

The economic burden of chronic disease is substantial, not least stemming from the costs of care for people with disease and the costs from loss of productivity in the economy. The potential economic benefit from efforts that reduce the prevalence of chronic disease is very high. This potential is even greater if we factor in the willingness of people to pay to avoid disability and death.

The extent of many chronic diseases, like heart disease and diabetes, could be significantly reduced if risk factors such as smoking, obesity, excess alcohol, diet and lack of exercise were tackled. A multi-pronged approach for tackling chronic disease would encompass: primary prevention through health promotion, education and public health strategies and secondary prevention through use of patient education and lifestyle change programmes, and through use of clinical and pharmacological interventions. Achieving behavioural change is challenging, with information on risk factors and the importance of adherence to drug therapies, unlikely to be sufficient on their own.

There is growing evidence that self-management approaches, which are patient-centred and really engage the person with the management of their condition, not only lead to care that is more closely tailored to a person's situation but also help motivate people to manage their condition. The use of information and communication technologies has the potential to allow for personally tailored solutions without the high costs of doing this in a face-to-face setting. There is evidence that telephone-based coaching and online programmes are effective at improving patient outcomes and reducing costs of care.

As well as the need to motivate patients, a final element of a chronic disease strategy should reflect the need to motivate and focus healthcare professionals on chronic disease management. This is a complex area but there is evidence, although somewhat mixed, that both better integration between primary (general practice) and second (hospital) care, and the use of payment-for-performance mechanisms can bring benefits.



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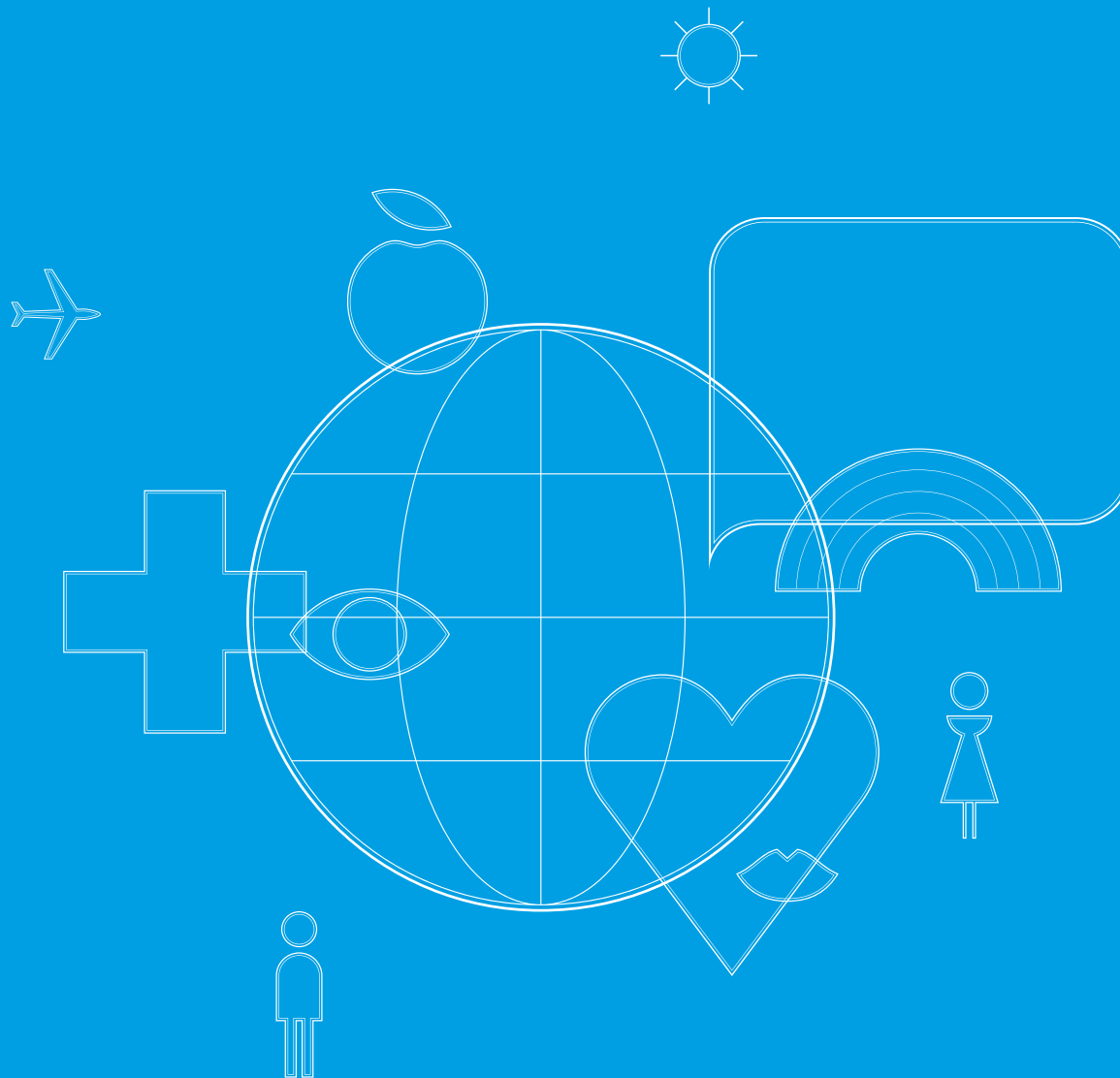
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