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The effects of the financial crisis on primary prevention of cancer

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ABSTRACT

The present financial crisis will affect primary cancer prevention through several avenues: personal lifestyle choices, exposure to environmental risk factors, decisions made in the private sector and public policy on cancer prevention. Whilst it is clearly problematic to reach solid conclusions on a direct connection between economic crises and cancer mortality, we can identify trends that provide guidance for further action. For some lifestyle choices such as smoking or diet, we argue that public policy may channel existing tendencies during times of crisis for clear added value. In other areas, including research and health system investments, we will make the case that the resources not used now for cancer prevention efforts will lead to increased costs (both financial and human) down the road. Policy makers face a clear choice: they can follow a cost contention strategy, which may reduce expenditure in the short-term only to increase it in the long-term, or they can use the financial crisis as an opportunity to make difficult choices in terms of health service rationalisation, whilst at the same time strengthening evidence-based prevention policies. In short, we argue that despite the scarcity of funds and the governmental priorities on economic recovery, cancer prevention is more relevant now than ever.

1. Introduction

Enduring political, economical and social changes will doubtless arise from the worldwide financial crisis that erupted in 2008. In all arenas, including the field of public health and cancer prevention, individual and policy decisions can be characterised by a damage control mentality or, alternatively, as an opportunity to correct mistakes and build a more solid foundation for the future. In this paper, we will briefly review the existing literature for clues on how the present crisis will affect cancer prevention with regard to personal lifestyle choices, exposure to environmental risk factors, decisions made in the private sector and public policy.

There are inherent difficulties in this type of analysis. First of all, it is clearly problematic to reach solid conclusions on the connection between economic crises and cancer mortality given the amount of time needed to account for the required induction period and the complexities involved in establishing causal links. Whilst much has been written on the causal mechanisms between unemployment and overall

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mortality (see Box 1), most of these studies have taken place in the United States (US) (with different social protection schemes) and have usually found clearer (and cyclical) links in the short-term. Because cancer can take decades to develop, different study models may be required to explore potential correlations. The heterogeneous array of pathologies encompassed under the umbrella term 'cancer' also poses challenges because recession can affect different cancers through different pathways. Finally, the financial crisis is affecting countries very differently; in Europe, the Netherlands and Norway have maintained stable unemployment rates near or below 4% whilst Spain, Ireland and Latvia have seen significant decreases in their working population (Fig. 1).

Box 1 Causal links between mortality and financial crisis.

The causal mechanisms between financial crisis and mortality are multi-faceted, potentially influenced by multiple factors:

- the strength of the social safety net,[1] generally robust in European countries
- demographics, with specific groups (socially disadvantaged, the young[2]) being harder hit by crises
- liberalisation of employment laws, with subsequent decreases in the number of permanent contracts and job security in general

Regions such as the former Soviet states reacted to economic troubles with dramatic reductions in life expectancy. However, recent evidence points out that wealthy countries experience short-term improvements[3–7] owing to less exposure to occupational risks and traffic accidents, as well as decreased opportunity cost of healthy leisure time activities.[8] These findings overturn those of past studies,[9,10] which reached different conclusions by using simpler time series models.

In this article, we examine specific elements in isolation (for example, tobacco smoking or public investment in research) in order to identify general trends that provide policy makers with guidance for further action (Table 1). In some cases, such as for some lifestyle choices, we find that public policy may channel existing tendencies for clear added value. In others, including research and health system investments, we make the case that the resources not used now will lead to increased costs (both financial and human) down the road. In all cases, we argue that despite the scarcity of funds and the governmental priorities on economic recovery, cancer prevention is more relevant now than ever.

2. Lifestyle risk factors during an economic downturn: never let a crisis go to waste

Cancer prevention research estimates that approximately a third of all cancers can be avoided, most of these by modifications in lifestyle choices. A well established body of evidence points to smoking and excessive alcohol intake as serious risk factors for cancer, whilst growing evidence suggests that poor diet, physical inactivity and obesity also play a major role in the development of malignant neoplasia.[1]

Any lifestyle modification requires a great effort on the part of individuals, but a financial crisis, with the ensuing economic pressures, can act as a catalyst that can reinforce or ideally reverse negative choices. Herein we review the existing evidence of how past recessions have affected lifestyles, and we identify current trends that open the door to effective public health action.

2.1. *Tobacco*

Because tobacco is intrinsically addictive, its use has historically remained stable during financial crises. Smokers may downtrade, as they did in South Korea and Russia after the 1998 collapse of the Asian market[2,3]; however, there is little evidence demonstrating that economic downturns alone lead smokers to quit.[4] On the other hand, a slight decrease (0.13%) in the amount of cigarettes smoked has been observed.[5]

However, increased government commitment to combating tobacco use may make this crisis different. Phillip Morris International reported a 2.9% decrease in cigarette shipping in the European Union between 2007 and 2008, even after calculations were made to adjust for a dramatic decline motivated by a rise in excise taxes in Poland.[6] In the US, harder hit by the recession, a 62-cent excise tax per pack was implemented in 2009,[7] and the Altria group (approximately 50% of the American market) reported no less than a 12% decrease in cigarette shipment volume between the third quarter of 2008 and 2009.[8] This figure is in contrast to the more moderate 7% decrease in total cigarette consumption observed in the US between 1998 and 1999, following a much higher 91-cent tax per pack implemented during a period of economic expansion.[9,10]

One caveat to this positive news may be that decreases in smoking rates are disproportionately due to less people taking up smoking or to higher quit rates amongst occasional smokers as opposed to significant impacts in smoking rates amongst heavy smokers. Therefore, specific outreach and support for smokers who want to quit (i.e. individual or group counselling, reimbursements for tobacco cessation therapies) will be necessary to optimise the effects of other tobacco control policies (such as excise taxes) during the recession.

2.2. *Alcohol*

Existing evidence on alcohol intake during financial crises is contradictory and seems to be dependent on a wide variety of factors: gender, age, marital status, national context, the severity of the economic downturn and the social protection available to citizens. Globally, alcohol consumption seems to act like that of an ordinary (or luxury) good, with depressed sales and downtrading (including switches from spirits or wine to cheaper alcoholic products such as beer) during periods of economic contraction. Short-term behavioural changes will probably depend greatly on previous drinking habits, which can vary significantly by country, gender and age.[11] On the other hand, recent evidence points to long-term

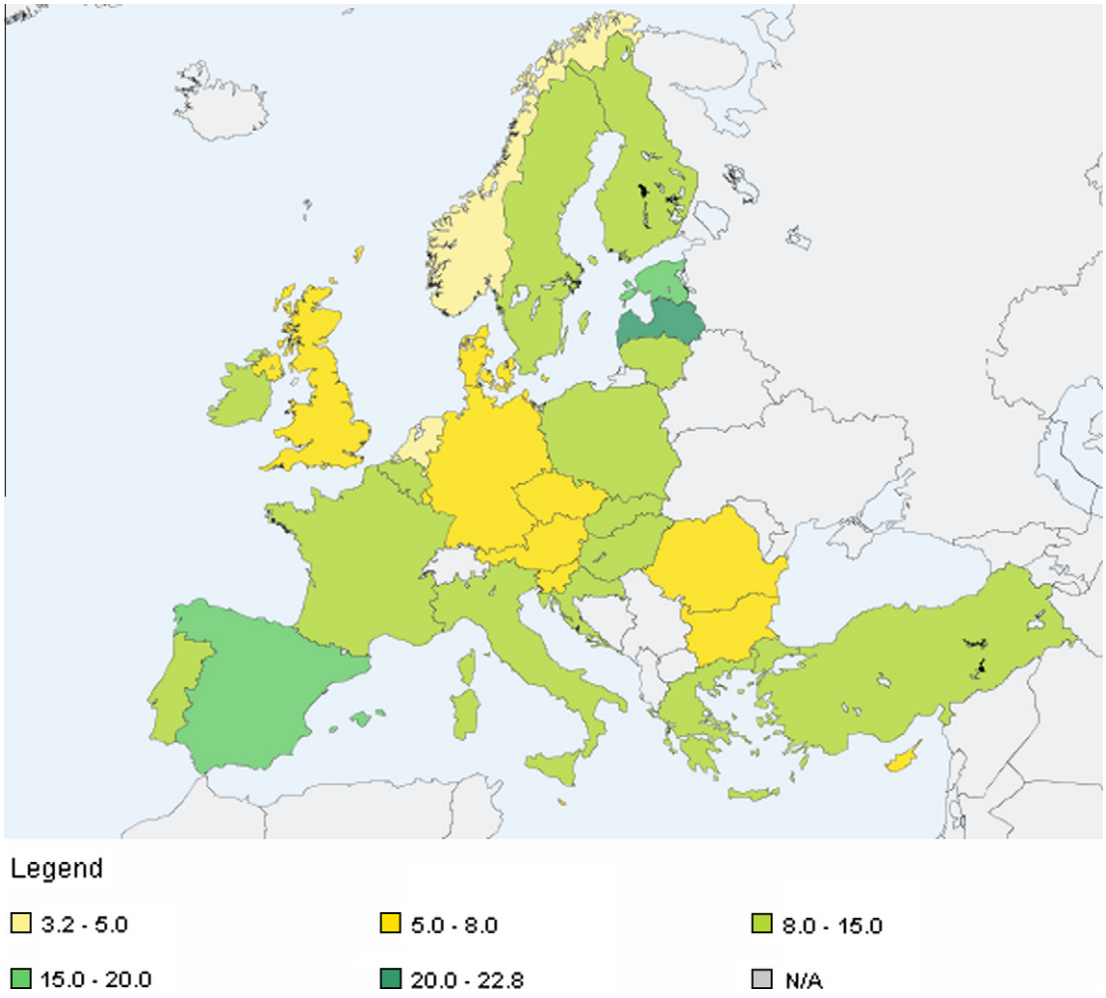

Fig. 1 – Harmonised unemployment rate in European countries, December 2009 or latest available data. *Source:* Eurostat. Unemployment rate. The European Commission. Available at http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=teilm020&tableSelection=1&plugin=1.

unemployment as a significant risk factor for heavy drinking habits (more than five drinks per sitting) later in life, independent of age, sex or later socioeconomic status.[12] Abstinence levels do not seem to be affected.[13]

European studies have reported that alcohol abuse increases amongst the involuntarily unemployed[14] and worsens with a severe economic downturn, although the problem can be ameliorated by increased investment in social protection.[15] Young, single males are particularly vulnerable,[16] whilst older adults are more likely to reduce alcohol intake to save money.[17] Committed efforts directed towards risk groups may have an effect on cancer incidence in the long term, although these will probably not be as dramatic as the potential short-term improvements in suicide rates, road accidents, poisonings, re-employment prospects and other alcohol-related impacts on society.

2.3. *Diet and physical activity*

Changes in diet are prevalent during times of financial crisis, as reduced income and/or consumer confidence affects how citizens spend money on food items. However, few studies have been carried out on these dietary modifications, and there is no consensus regarding the net effect on obesity rates. Whilst some authors observe increases and postulate that people are switching to cheaper, processed foods,[18] others have noticed moderate decreases, attributing these to more cooking, less eating out and more time devoted to leisure-time physical activity.[5,19] In fact, both trends are apparent. The Wall Street Journal has reported significant declines in US sales of sweets, poultry and red meat along with increases in sales of vegetables, eggs and dairy products.[20] Likewise, the American and European press report that sales of vegetable seeds have surged dramatically,[21,22] whilst Google Trends shows a pronounced rise in searches for the term 'recipe' throughout 2009 and early 2010. On the other hand, fast food chains have also performed well,[4] indicating that whilst home cooking may increase, so, too, does consumption of fast food.

Specific data on exercise habits during a recession are scarce as well, and conclusions are often intuitive. Physical activity levels may increase if people have more time to spend

Table 1 – Potential short- and long-term effects of financial crisis on cancer prevention. Summary of key findings.

Risk/issue for cancer prevention	Potential short-term effects	Potential long-term effects
Lifestyle		
Smoking	Individual economic pressures as an added value that discourages uptake of smoking habit and encourages smokers to quit	Maintaining lower smoking rates will depend on smoking cessation support mechanisms (availability of counselling, pharmacological therapies, etc.)
Alcohol	Downtrading and depressed sales in the general population, with increased abuse amongst specific population pockets (i.e. young, unemployed men) Abstinence levels unaffected	Long-term unemployment is a significant risk factor for a heavy drinking habit later in life, independent of demographic characteristics; to our knowledge, no policies have addressed this specific risk
Diet and physical activity	Varying effects; increased home cooking and/or increased consumption of fast or processed food Potential decreased use of car in favour of public transportation or bicycle	Undetermined, but changes motivated for financial reasons could lead to long-term changes in eating habits and transport use
Environment		
Occupational risk	Relaxed safety precautions in many businesses, counteracted by decreased employment and production levels; net effect undetermined	Long-term consequences of increased exposure to carcinogens; quantifiable effects undetermined
Climate change	Decreased global consumption of fossil fuels Postponement of environmental protection issues in favour of economic recovery Government policy impulse to support green industry as a way to stimulate economy	Exposure to unchecked air and water contaminants could result in increased cancer incidence due to environmental carcinogens Long-term growth in green industries could potentially slow the effects of climate change
Private sector		
Pharmaceutical research	Diversion of investments to smaller firms and developing countries Downscaling research projects	Undetermined
Private insurance	Increase in prevention programmes for their perceived cost-effectiveness Adjustments in premiums according to behavioural risk	Undetermined, although these measures have the potential to lead to reduced incidence in the future
Public policy		
Health services & public health investments	Cuts to population-based actions as a way of sustaining curative health services Rationalisation of service models, with increased emphasis on public health	Potentially higher incidence rates and costs in the future Potential to control costs in both the short and long term
Vaccination	Postponement of HPV vaccination uptake	Increased need for population-based screening to continue in the long-term; higher potential burden of cervical cancer
Cancer prevention research	Decrease in voluntary funding of projects Varying strategies at the government level; some countries increase funding (as economic stimulus) whilst others decrease it (to cut costs)	If long-term projects are not sustained, future breakthroughs on how to prevent cancer will be severely constrained

Source: Authors' compilation.

on themselves or with friends, but a higher workload or less money could lead to overall decreases in leisure activities. Studies in Japan and Canada examined the link between physical activity and unemployment, observing comparable physical activity levels amongst the employed and unemployed.[23,24] On the other hand, manual labourers who lose their jobs will also lose a natural outlet for physical activity, a fact that could have a greater impact on lower-income sub-populations. Further research is needed before firm conclusions can be reached regarding how a financial crisis affects exercise habits throughout a population.

3. Environmental risk factors

Different factors play a role in human exposure to environmental carcinogens. Some depend on the health of the environment as a whole (i.e. the state of the ozone layer), whilst others change according to highly specific industries and

activities. In turn, human efforts that reduce exposure to contaminants can be intentional (i.e. environmental or labour protection laws) or not (i.e. fluctuating levels of industrial production). In this section we will examine how the current financial crisis affects environmental exposure to carcinogens as well as our ability and willingness to control them.

3.1. *Exposure to occupational contaminants*

At least 2.3 million deaths worldwide are directly attributed to occupational hazards, including cancer, and the latest incidence figures show an upward trend.[25] Because the numbers tend to rise as data collection improves, the real figures could in fact be much higher. Indeed, the United Kingdom estimates that every year, anywhere from 20,000 to 40,000 incident cancer cases could be caused by occupational exposure to carcinogens, leading to a tremendous human and financial cost to society.[26] Most of this exposure occurs in an industrial setting amongst the working class, the hardest hit by the current crisis, and so it stands to reason that overall contact with carcinogens will decrease as production levels fall.

However, there are reasons to be pessimistic. First of all, both private companies and governments tend to take shortcuts in occupational safety controls during periods of economic hardship. This is especially true for small companies and in developing countries.[27] One Korean study during the crisis in the late 1990s linked the reduction of health and safety expenses to the ability to avoid bankruptcy, exemplifying the terrible choice businesses often face: less worker safety or economic ruin.[28] For industries with potentially high levels of contamination such as mining, this effect is compounded; managers generally choose to cut costs rather than production in order to maintain their profit margin, which can lead to net increases in the production of dangerous carcinogens.[29]

3.2. *Environmental protection and economic crisis*

Although the effect is somewhat more indirect, global climate change and environmental pollution are also relevant in terms of human exposure to cancer-causing agents. The consequences of past degradation of the ozone layer (and the subsequent rise in dangerous Ultra Violet (UV) radiation) will be with us for decades,[30] and air and water pollution brought about by industrial production and intensive agriculture entail other significant risks to human health.[31]

In this sense, the current crisis may play a positive role, at least in developed countries. Less demand for fossil fuels provides a fragile respite to the environment, and some governments are devoting enormous resources to strengthening green industries as a way to create jobs, including investments in renewable energy and weatherisation of homes as well as the construction of bicycle paths, expansion of public transport systems and high speed rail as an alternative to cars and airplanes.

On the other hand, the commitment to environmental sustainability in emerging superpowers such as China, India and Brazil is less consolidated, and strong international pressure may be necessary to create enough incentive for these to act decisively. The financial crisis could also distract governments from the need for critical action in environmental protection; the pressing need to create jobs could relegate environmental concerns to the back seat nationally and internationally. In fact, the United Nations summit on climate change recently held in Copenhagen[32] concluded with an upsetting, non-binding final statement, falling short of the key actions (including specific emission reduction targets) that many scientists and some governments have said are necessary by mid century to avoid potentially dangerous consequences of climate change and ultimately for health.[33]

4. Concerns in the private sector

Does financial crisis threaten efficient and sufficient allocation of private funds for preventing cancer? In this section we specifically consider pharmaceutical research programmes for cancer prevention and behavioural changes related to private insurance.

4.1. *Pharmaceutical research*

Since the launch and widespread adoption of the HPV vaccine, the development of innovative cancer vaccines has emerged as a new opportunity not only for cancer prevention (as will be discussed in Section 5.2), but also for the pharmaceutical industry itself. However, these technological advances are coinciding with a major shift in R&D processes, opening up a period of uncertainty. Overall productivity decreases in traditional pharmaceutical research, exacerbated by the recession,[34,35] are contributing to the diversion of R&D investments towards developing countries, contract research organisations (CROs) and small biotech firms.[36,37] Meanwhile, conventionally funded R&D is increasingly vulnerable to cost containment measures, downscaling of preclinical and phase 1 projects, and restructuring of R&D portfolios.[38] Whilst it is still too early to say how this market shift will affect the affordability and production of vaccines and other cancer-related health technologies, it is clear that the industry will have to adapt to the changing circumstances if it is to meet the expected challenge of rising cancer incidence over the next several decades.

4.2. *Considerations regarding private insurance*

Health insurance funders, constrained by economic limitations, have implemented cost-saving measures, renegotiated prices and payments to providers and even penalised patients who do not adhere to treatments and preventive recommendations.[39,40] Interestingly, this is occurring despite the fact that the cost-effectiveness of prevention programmes has not been observed in short-term calculations.[41] Sophisticated mechanisms to adjust premiums for behavioural risk as well as Pay For Performance (P4P) practices aimed at increasing prevention and kerbing misuse of services have received an impulse during the downturn,[42–44] although there is still no robust assessment tool to gauge the precise results.[45] In any case, though, it seems evident that there are clear opportunities to expand cancer prevention programmes despite (or perhaps because of) current economic difficulties.

5. Public policy for cancer prevention

As European cancer control strategies become increasingly integrated and interdependent, the boundaries separating primary prevention, secondary prevention and treatment (or tertiary prevention) are blurring. Innovative health technology and changing carcinogenesis factors in the community also play a role; the identification of the BCRA gene can lead to the option of a preventive mastectomy, whilst individualised cancer vaccines (Oncophage) are formulated from patients' tumours and used as treatment.[46] Thus, public policy decisions regarding what funds to direct towards cancer prevention and treatment are now more complex than ever. Pressure exerted by the financial crisis further intensifies the debate on resource investment for cancer prevention and treatment as well as for other health and societal needs.

5.1. *Health services and public health investments*

Even in good economic times, the often exorbitant cost of gaining Quality Adjusted Life Years (QALY) for cancer patients is subject to considerable debate and increasing scrutiny.[47] Health systems wonder whether cancer deserves a status of exceptionality[48] and whether terminal care and rare cancers merit even higher investments.[49–51] The demand for more resources for cancer treatment is growing; indeed, for cancers susceptible to early detection and treatment, 5-year survival rates correlate positively with health expenditure (although the correlation is more pronounced for private expenditure than for public; Table 2).

Health system sustainability and effectiveness depend on the pay threshold that society is willing (and able) to support. The challenge also concerns the value of the utilitarianism perspective and the potential inequality in access to treatments. Programmes with long-term returns, particularly community-based interventions aimed at improving lifestyles, may be the first casualties of public budget cuts in some countries; short-term electoral incentives and the lack of immediate visibility in health outcomes do not favour public investments in primary cancer prevention during times of financial crisis. Rather, in the face of the crippling deficits that often accompany high unemployment rates, it may be more politically feasible to cut community-based actions than to reduce coverage for patients with cancer, no matter what the cost of the treatment. Developing countries are especially vulnerable, and have seen dramatic reductions in investments in human capital, whether in the field of health or in education.[52]

On the other hand (and unlike past crises), there is a growing commitment in Europe and other regions to improve population health as a means of increasing economic wealth, following the principles set out in the 2008 Tallinn charter.[53] Equity and solidarity, as pillars of sustainable economic growth, have been recognised as being very relevant in the context of the global financial crisis, and recent ministerial conferences have emphasised strategies such as the rationalisation of hospital services, the increased use of generic drugs and population-based health promotion

Table 2 – Correlation between public and private expenditure and 5-year survival rates for breast and colorectal cancer, for 12 OECD countries.

	Total expenditure in health 2007 (capita US $ PPP-adjusted)	Public expenditure	Private expenditure	Five-year survival, breast cancer, 1997–2001	Five-year survival, breast cancer, 2002–2007	Five-year survival, colorectal cancer, 1997–2001	Five-year survival, colorectal cancer, 2002–2007
Total expenditure in health 2007 (capita US $ PPP-adjusted)	1.0000						
Public expenditure	0.7876	1.0000					
Private expenditure	0.8503	0.3454	1.0000				
Five-year survival, breast cancer, 1997–2001	0.7025	0.4566	0.6799	1.0000			
Five-year survival, breast cancer, 2002–2007	0.7090	0.5543	0.6064	0.9174	1.0000		
Five-year survival, colorectal cancer, 1997–2001	0.5930	0.4019	0.5600	0.9090	0.8712	1.0000	
Five-year survival, colorectal cancer, 2002–2007	0.5530	0.2829	0.6005	0.8813	0.8111	0.9755	1.0000

Source: Organization for Economic Cooperation and Development. Health at a glance 2009: OECD Health Indicators. OECD; 2009 [cited 2010 March 8]. Available at: http://www.oecdilibrary.org/content/book/health_glance-2009-en.

efforts as ways to save money without sacrificing health benefits or access to services.[54] The health sector is also an important independent motor for job creation and the economy, constituting a key area that can attract funds from national economic stimulus packages. As a social safety net, it is also an important tool in mitigating the devastating mental and physical health effects of rapid and negative economic downturns.[55]

5.2. *Vaccination*

Uptake of the HPV vaccination is one concrete example of how prevention policies may be restricted or modified by financial crises. When the economic recession officially started (in December 2007 in the US[56] and in 2008 in Europe), universal HPV vaccination for girls was approved or in the process of approval in most developed countries. Despite the lower cost per QALY gained in the developing world, most of these countries did not follow suit. Now, budgetary limitations derived from the economic crisis may be pushing western nations in a similar direction; some countries like Ireland have cut vaccination programmes entirely, whilst others have stepped up negotiations for lower prices.

5.3. *Cancer prevention research*

Fortunately, pan-European initiatives, including the well-funded Seventh Framework Programme (slated to continue until the end of 2013), will provide some stability to the cancer research field during this period. However, the recession is likely to have a strong impact on both publicly and charitably funded cancer research, although the full consequences may not be apparent immediately. Perhaps the most vulnerable funding sources are those that are derived from donations—Cancer Research UK predicted that 2009 revenues would fall between 4% and 5% as individuals and companies reduce their contributions. [57]

Governments, too, may react to the crisis by cutting funding for R&D, although this varies enormously. For example, Spain cut its health research budget by 8.8%,[58,59] whilst the US *added* US$10 billion over 2 years to the NIH budget as part of a broader stimulus package.[57] Both these countries have been hit hard by the recession—Spain registered a 18.9% unemployment rate in December 2009,[60] whilst 10% of workers were officially unemployed in the same month in the US.[61] Such disparate strategies highlight the nature of this recession as an important crossroads; some governments may take reactionary measures in the face of financial crisis, but others could take advantage of the transcendental circumstances to prepare for a better tomorrow.

6. Conclusions and recommendations

Cancer prevention—like cancer itself—encompasses a great number of diverse factors, including lifestyle choices, genetics, environment, occupation, infections and access to preventive healthcare. It is no surprise, then, that cancer control efforts can overlap with everything from the control of hypertension to the reduction of greenhouse gases. Indeed, the depth and breadth of these concerns almost make it a valid proxy to judge the overall investment that individuals, public institutions and private enterprise are prepared to make towards better human and environmental health.

This is no less true when economic challenges assume a more prominent place in society's consciousness; rather, financial crisis can serve as a time to reflect on our collective priorities and personal choices. The current upheaval can and should serve to lay a more solid foundation for the future. We do not know how the economy will evolve in the next decades, but we do know that unless vigorous action is taken by policy makers and individuals, the cancer burden will only grow, leading to enormous human costs and unsustainable costs for health systems.

Furthermore, there are encouraging indications that prevention efforts hold added value in times of financial crisis. As individuals give up or reduce certain unhealthy lifestyle habits owing to cost, they may be especially receptive to new and healthier choices. Likewise, as governments take steps to repair and rebuild the economic infrastructure, they may be encouraged to examine the long-term sustainability of the health system and the advisability of particular programmes (Box 2). They could also take advantage of levying higher taxes on tobacco, alcohol and other unhealthy goods like trans fats or processed sugars, channelling new revenues towards job-creating disease prevention and social welfare programmes.

Health professionals and cancer control advocates must be assertive in insisting that financial crisis is not an excuse for inaction, but rather an opportunity to take a new and positive journey towards preserving and strengthening the most valuable commodity of all our health.

Box 2 Cancer prevention policy approaches during financial crisis.

Do

- ✓ Take a long-term view; set the foundation for a healthier future in policy decisions
- ✓ Raise taxes on unhealthy goods (i.e. cigarettes, alcohol), but offset them with other evidence-based public health interventions to support behaviour change
- ✓ Adapt public health messages to reinforce economic incentives for healthy behaviour changes
- ✓ Provide incentives/subsidies to businesses to maintain investment in occupational safety
- ✓ Rationalise, don't ration, health expenditure. Systems can always be more efficient
- ✓ Stimulate the economy through necessary investments in the health sector, especially with human resource-intensive activities (i.e. education, counselling, population-based public health programmes)
- ✓ Strengthen green industries, which are good for the economy, the environment and human health

Don't

- × Cut prevention costs now that will lead to more care-related costs later
- × Relax regulatory enforcement on environmental and occupational risks to save money
- × Forget that future lives will depend on wise decisions in the present

Conflict of interest statement

None declared.

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