

Most Cancer can be prevented: We can do more

1. Cancer cases and deaths increasing

Because of increasing population and life expectancy and aging, the number of new cases of cancer and cancer deaths is increasing globally. Such increases are also seen in middle and lower income countries when communicable diseases are under control[1]. Moreover, because survival of cancer patients improves, the number of surviving cancer patients also increases rapidly. Once treated as a cancer patient, even when the cancer has been cured, the patient often needs to be followed up for an indefinite period, and sometimes lifelong, resulting in increasing patient load due to cancer in the health care and related settings and in the community. All these have resulted in the impression of the public and many health care professionals that cancer is unavoidable. What is unavoidable is the increasing number of new cancer cases, deaths and cancer survivors due to increasing population, aging and better survival. However, age standardized incidence and mortality rates of cancer overall and some specific cancers have been decreasing in the past few decades in some high income countries, indicating the benefits of cancer prevention from public health measures, such as tobacco control which has resulted in decreased age standardized rates of lung cancer in the UK and USA. In low and middle income countries, the picture is different. In China, for example, the tobacco epidemic is growing with rapidly increasing rates of tobacco induced cancers.

2. How much cancer is preventable?

Even it is certain that most cancer can be prevented, the size of the preventable fraction is uncertain and can be confusing. There are different statements from the World Health Organization (WHO). From the World Cancer Day 2011, WHO states that “about **30%** of cancer deaths can be prevented” and “tobacco use is the single most important risk factor for cancer”[2]. From the answer of the Q and A section on the same page, the following is found: “about **40%** of all cancer deaths can be prevented”[3]. The 2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases states that “...over **a third** of cancers could be prevented by eliminating shared risk factors, mainly tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol”[4]. Another statement about tobacco is “Tobacco use is the single greatest avoidable risk factor for cancer mortality worldwide, causing an estimated **22%** of cancer deaths per year”[5].

However, the World Cancer Research Fund/American Institute for Cancer Research 2009 Report says on page 2 “...cancer is mostly preventable. If nobody smoked or was exposed to tobacco, about **one third** of all cases of cancer would not occur. Following healthy patterns of diet and physical activity as set out in the 2007 World Cancer Research Fund/American Institute for Cancer Research (WCRF/AICR) Diet and Cancer Report has the potential to prevent **a similar amount**”[6,7]. This means that about **two third** of all cancer cases are preventable. Note that the above percentages refer to cancer cases but not deaths.

The risk factors above have not included other important causes of cancer, such as infection or infectious agents (for example liver cancer, cervical cancer and stomach cancer, which can be prevented by vaccination and/or treatment of the infection and better hygiene and safe sex), occupational and other environmental and non-occupational exposures to carcinogens (such as ionizing radiation from environmental pollution, outdoor air pollution, indoor air pollution from burning of biomass, consumption of mouldy grains, and arsenic from polluted water), exposures to sunlight and UV light, and some medications including cytotoxic drugs and ionizing radiation from imaging and radiotherapy. Because many people are exposed to more than one risk factor and different risk factors interact, the sum of the attributable fractions/percentages of several risk factors can be more than one. Hence, it is not clear what fraction would these add to the above two third, but it is clear that more than two third of all cancer can be prevented. It is not clear what percentage of all cancer globally is primarily due to genetic factors without an environmental cause but this is likely to be a minority. And if we exclude secondary prevention by screening, a great majority of all cancers, which are caused by environmental factors, are preventable by removal of the environmental factors.

3. Tobacco control

As about one third of the cancers are caused by tobacco, tobacco is the single most important target. The WHO Framework Convention on Tobacco Control (FCTC) is the first and the only international treaty from WHO and by 21 June 2011, the FCTC has been ratified by 174 parties (countries and others) covering 87.4% of the world population, with the notable exception of the USA. The WHO MPOWER package includes six policies which can counter the tobacco epidemic and reduce its deadly toll[8]. These are: **M**onitor tobacco use and prevention policies, **P**rotect people from tobacco smoke, **O**ffer help to quit tobacco use,

Warn about the dangers of tobacco, **Enforce** bans on tobacco advertising, promotion and sponsorship, and **Raise** taxes on tobacco.

The benefits on quitting in reducing cancer and other disease risks have been well documented. Quitting can result in saving many more lives much more quickly than preventing uptake of smoking in young people. According to a World Bank Report, by 2020, if adult's smoking reduced by 50%, 180 million deaths can be prevented; if youth starting smoking reduced by 50%, 20 million deaths can be prevented[9]. Although the tobacco epidemic is growing, the FCTC and MPOWER are important models for prevention of cancer and other diseases due to other causes or risk factors. Health care professionals can do more in helping patients to quit smoking, as this is the most cost effective way to prevent cancer and other tobacco-induced diseases. Even very simple and brief advice is effective, and the effect size increases with stronger doses of advice and counseling, medications and follow up.

4. Alcohol control

The fact that alcohol has been a confirmed human carcinogen since 1988 by the International Agency for Research on Cancer (IARC) is not widely known in the public and among many health care professionals. According to IARC, alcohol can cause cancer of oral cavity, pharynx, larynx, esophagus, liver, colorectum and breast. The 2011 WHO Global Status Report on Alcohol and Health has highlighted that the harmful use of alcohol is a worldwide problem and the 2010 World Health Assembly approved a resolution to endorse the global strategy to reduce the harmful use of alcohol[10].

The term "harmful use" implies that there can be "safe use" but there are no safe limits for intake of carcinogens. The alleged heart protection effect is believed by many and has been used for massive alcohol promotion campaigns by the alcohol and related industry. While the carcinogenicity is confirmed, the heart protection effect remains controversial. There is also no public health policy or clinical practice for the use of alcohol for heart protection. The reduced risk of heart disease in moderate drinkers could be due to the fact that moderate drinkers, especially in western countries where drinking is the norm, are more self restraint and health conscious and they have a healthier lifestyle[11-13]. Recent studies in Chinese have not found the beneficial cardiovascular effects of moderate drinking[14,15]. Further research in non-western countries with low drinking prevalence, using Mendelian randomization, is needed.

The 2007 WCRF/AICR Report recommends to “limit alcoholic drinks”[6]. The Public Health Goal is “Proportion of the population drinking more than the recommended limits to be reduced by one third every 10 years” and the Personal Recommendation is “If alcoholic drinks are consumed, limit consumption to no more than two drinks a day for men and one drink a day for women.” However, the recommendation on sugary drinks is to “avoid sugary drinks”. But sugary drinks are not confirmed human carcinogens. It is not clear why the recommendation against sugary drinks is stronger and more stringent than that against alcoholic drinks. The more appropriate recommendation should also be to “avoid alcoholic drinks”. Such recommendation for primary prevention would be less attractive for individuals, especially those who drink moderately, as their relative risks are not very high [7]. For public health, because of widespread exposure to alcohol at moderation or more in the population, the burden of cancer attributable to alcohol is great. Hence, the population approach, as highlighted by Geoffrey Rose, to reduced overall population exposure, should be a top priority [16].

While there are important control measures in the 2011 WHO Report, these are not enough when compared to FCTC and MPOWER package. Alcohol control is at the early stage with not many successful stories. The alcohol epidemic is growing more rapidly than the tobacco epidemic, especially in low and middle income countries (LMIC) such as China. There are now a few advocates for a Framework Convention on Alcohol Control (FCAC)[12,13,17,18]. Even if we are optimistic, it will take many decades before we have an FCAC. There are many experiences and lessons that alcohol control can learn from tobacco control, and if the latter is not successful, the former is doomed. Meanwhile, the MPOWER package is totally applicable to alcohol control, by simply replacing the word “tobacco” with “alcohol”.

While the tobacco industry and the alcohol industry are both strong, rich and powerful, and the former has been condemned (for example, by Dr M Chan, Director General of WHO as “ruthless, devious, rich and powerful ...”) [19] but the latter is favored and widely supported by many. The industry is expanding its market aggressively in Asia and many LMIC, with strong support by the exporting countries[17]. There are virtually no effective control measures in place in most parts of the world. Many governments are considering increasing alcohol tax and price, which should be an effective control measure to reduce consumption. But in 2007, Hong Kong SAR Government reduced wine and beer tax by 50%, and then

reduced it further to zero in 2008. This has resulted in massive increase in alcohol advertisements and promotion, auctions, sales and consumption especially among young people [18,20]. Such unprecedented and massive tax reduction will certainly lead to a public health disaster in this most urbanized and westernized Chinese city which is used to have a much lower drinking prevalence than in the West.

Alcohol control is definitely much more difficult than tobacco control. Furthermore, many health care and public health professionals are alcohol drinkers, whereas few, if any, tobacco control advocates are current smokers (many of them are never smokers or have quit for years). To what extent one's own alcohol use would affect one's position and action about alcohol control is an important research question which warrants further research. Warning about the dangers of alcohol is probably the first step, and its carcinogenicity needs to be emphasized. "Passive drinking" is a major growing problem especially in China as many nondrinkers or moderate drinkers are being pressurized to drink excessively during dinners and other social functions. In Hong Kong, there were examples of alcohol promotion by health care organizations in collaboration with or with sponsorship from the alcohol industry. Such activities can be seen as medical endorsement of drinking and should be stopped.

5. Food, nutrition and physical activity

The 2007 WCRF/AICR Report has 8 recommendations on food, nutrition and physical activity (FNPA) for the prevention of cancer, which are: (1) Be as lean as possible within the normal range of body weight, (2) Be physically active as part of everyday life, (3) Limit consumption of energy-dense foods; Avoid sugary drinks, (4) Eat mostly foods of plant origin, (5) Limit intake of red meat and avoid processed meat, (6) Limit alcoholic drinks, (7) Limit consumption of salt: avoid mouldy cereals or pulses, and (8) Aim to meet nutritional needs through diet alone. These are put together with both public health goals and personal recommendations. Furthermore, the 2009 WCRF/AICR Report on Policy and Action for Cancer Prevention has stated that "the need for action is increasingly urgent as well as important". The Report emphasized on strategic policies and actions for multiple stakeholders, including multinational bodies, civil society organizations, government, industry, the media, schools, workplaces and institutions, health and other professionals and people.

6. We can do more

The lessons and experiences from tobacco control are relevant for many other control and preventive measures. Shall we also need a Framework Convention on Food, Nutrition, Physical Activity and Obesity? Shall we also consider how MPOWER strategies can be applied to FNPA and Obesity as well? It appears that the complexities and challenges for FNPA and Obesity are probably even greater than for alcohol control and the situation would have to be much worse, before it would get better. Meanwhile, there are many preventive measures that are proven to be effective. Measures to prevent cancer will also prevent cardiovascular diseases, diabetes and many other diseases and can promote health, well being and quality of life. These measures can also help to protect the environment. We should recognize that resources going into preventing cancer will always be scarce compared to those for treatment. There is also a danger that screening or secondary prevention is being promoted much more than primary prevention. Screening is much more expensive and its benefits and harms should be carefully examined in each community. In places with low incidence and prevalence of a specific cancer, screening may do more harm than good, such as screening mammography in Hong Kong[21]. Conflicts of interests are everywhere and role models of advocates adopting all the personal recommendations above are difficult to establish. But we can do more and must do more, in advocating for and supporting effective legislation, policies and other actions, such as increase in tobacco and alcohol tax. As health care professionals, we need to help our clients, and the first and foremost, to help smokers quit and excessive drinkers to reduce or abstain from alcohol. Preventing uptake of smoking, drinking and other unhealthy lifestyle practices is certainly important but would be ineffective if all these are being actively promoted and practised by adults. We also need to organize ourselves so that our efforts can be more effective. Finally, we can help ourselves by not smoking, not drinking and adopting the WCRF/AICR recommendations.

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