4th INTERNATIONAL CANCER CONTROL CONGRESS

Prevention of Cancer and Non-Communicable Diseases

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Abstract

   Cancer is a leading cause of death worldwide, accounting for approximately 7.6 million deaths (13% of all deaths) in 2008. Cancer mortality is projected to increase to 11 million deaths in 2030, with the majority occurring in regions of the world with the least capacity to respond. However, cancer is not only a personal, societal and economic burden but also a potential societal opportunity in the context of functional life – the years gained through effective prevention and treatment, and strategies to enhance survivorship. The United Nations General Assembly Special Session in 2011 has served to focus attention on key aspects of cancer prevention and control. Firstly, cancer is largely preventable, by feasible means. Secondly, cancer is one of a number of chronic, non-communicable diseases that share common risk factors whose prevention and control would benefit a majority of the world's population. Thirdly, a proportion of cancers can be attributed to infectious, communicable causal factors (e.g., HPV, HBV, *H.pylori*, parasites, flukes) and that strategies to control the burden of infectious diseases have relevance to the control of cancer. Fourthly, that the natural history of non-communicable diseases, including cancer, from primary prevention through diagnosis, treatment and care, is underwritten by the impact of social, economic and environmental determinants of health (e.g., poverty, illiteracy, gender inequality, social isolation, stigma, socio-economic status). Session 1 of the 4th International Cancer Control Congress (ICCC-4) focused on the social, economic and environmental, as well as biological and behavioural, modifiers of the risk of cancer through one plenary presentation and four interactive workshop discussions. The workshop sessions concerned 1) the Global Adult Tobacco Survey and social determinants of tobacco use in high burden low- and middle-income countries; 2) the role of diet, including alcohol, and physical activity in modifying the risk of cancer and other non-communicable diseases; 3) the role of infections in modifying the risk of cancer; and 4) the public policies and actions that can be implemented to effectively reduce the risk of cancer at population levels. Workshop discussions highlighted the need for high quality data on the prevalence of modifiable factors in different settings, as well as the social, economic and environmental drivers of these factors, in order to inform prevention and control programs. For some factors, further work needs to be done to develop simple and valid measurement tools. Given that many of these factors are common to both cancer and other non-communicable diseases, cancer prevention should be viewed within the broader perspective of the prevention of non-communicable diseases and should engage all relevant actors, including the general public, health and other professionals, workplaces and institutions, the media, civil society, schools, governments, industry, and multinational bodies. Many policies and plans have been implemented in various settings to control the drivers of modifiable factors and promote health and well-being. Mapping, analysis, and contextualization of those policies that are relevant would be helpful to promote action around cancer prevention in different settings.

Keywords: Prevention and control of cancer - prevention and control of non-communicable diseases - social, economic and environmental modifiers of cancer risk - tobacco and the risk of cancer - food, nutrition, alcohol and the risk of cancer - infections and the risk of cancer - rational policies and actions to prevent cancer; World Cancer Research Fund Diet and Cancer Report - World Cancer Research Fund Policy Report - World Tobacco Control Framework - UNGASS 2011 Special Resolution

Introduction

   Most types and most cases of cancer are preventable.

Cancers that are genetically determined may amount to around 10 per cent, perhaps less, of all cases. Comparably, societies in which cancer has been least common have

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rates of cancer at all ages that are very much lower than are now current in industrialized countries. The single most preventable cause of cancer is smoking and other uses of or exposures to tobacco, which is estimated to account for around one-third of all cases. Food, nutrition, body weight and physical activity are of comparable importance, both as causes of cancer among those whose diet is poor or who are obese or sedentary, and as ways to prevent cancer among those whose diet is healthy, who are physically active, and who maintain a healthy body weight. Infection is also an important cause of cancer. Pioneering 'research on research' has been carried out by the World Cancer Research Fund International, in two major reports with a global perspective, published in 2007 and 2009 (WCRF/ AICR 2007; 2009). Analysis of all types of relevant evidence shows that rates of cancer, in common with those of other non-communicable diseases, are driven by social, economic and environmental as well as biological and behavioural factors. The purpose of this first session of ICCC-4 was to outline this 'big picture' of cancer prevention and control, of which medical approaches are one aspect. The purpose was also to set the scene for the Congress as a whole.

Methodology and Objectives

ICCC-4 Session 1 was on "Prevention of Cancer and Non-Communicable Diseases". Planning for the whole Congress, and especially this session, took into account that ICCC-4 was the first major international cancer prevention and control conference to take place after the United Nations High-Level Meeting on Prevention and Control of Non-Communicable Diseases, held in New York in September 2011 (UNGASS 2011). This gave the Congress a special importance and opportunity to explore how cancer prevention can be coordinated with the prevention of other major non-communicable diseases. Session 1 began with one extended plenary presentation: "Causes and Prevention of Cancer: the Big Picture" given by one main and two supporting presenters. The plenary presentation was designed to prepare Congress participants with an overview of the whole topic from a broad public health perspective, in which medical approaches are but one part of the total intervention framework. Its purpose was also to prepare participants for their engagement in four small-group interactive workshops on specific topics to be addressed in greater depth. Selected abstracts with themes in the topic area were presented orally within the workshops by the authors. Workshop leaders were asked to encourage agreement on brief recommendations that identified some key directions for further development of policies and actions after the Congress.

The objectives of session 1 were first, to explore social, economic and environmental as well as biological and behavioural modifiers of the risk of cancer; and second, to identify rational policies and effective actions whose purpose is to reduce incidence of and death from cancer at a population level. To this end, the following four issues were selected for discussion in the workshops:

1. What can we learn from the Global Adult Tobacco Survey regarding the social determinants of tobacco use in low- and middle-income countries?

2. How does diet, including alcohol, affect the risk of cancer and other non-communicable diseases?

3. How do infections contribute to the risk of cancer?

4. What are the public policies and actions that can be implemented effectively to reduce the risk of cancer?

Plenary Presentations

1. Causes and Prevention of Cancer: the Big Picture: **Geoffrey Cannon, Fabio Gomes,** and **Jon Kerner**

UN High-Level Meeting on NCDs: Political Declaration, Clauses 20, 21, and 54

20. Recognize that the most prominent non-communicable diseases are linked to common risk factors, namely tobacco use, harmful use of alcohol, an unhealthy diet, and lack of physical activity.

21. Recognize that the conditions in which people live … influence their health and quality of life, and that poverty, uneven distribution of wealth, lack of education, rapid urbanization and population ageing, and the economic, social, gender, political, behavioural and environmental determinants of health, are among the contributing factors to the rising incidence and prevalence of non-communicable diseases.

54. Engage non-health actors and key stakeholders, where appropriate, including the private sector and civil society, in collaborative partnerships to promote health and to reduce non-communicable disease risk factors.

The purpose of this plenary presentation was simple and also perhaps challenging. It was to provide an introduction to, and to support, the workshops that followed. It did this by making three main points (quoted above), from the Political Declaration issued at the United Nations High Level Meeting on the prevention and control of non-communicable diseases (NCDs), held in New York in September 2011 (UNGASS 2011). These main points were first, that cancer has many causes in common with those of obesity and other non-communicable diseases; second, that diseases – and health and well-being – have different types of causes; and third, that rational policies and effective actions depend on all relevant actors, of which the health professions are one, working together.

The Congress was held just a few weeks after the High-Level Meeting. Many participants in this Congress played vital roles up to and during the meeting, including UICC president Dr. Eduardo Cazap. Part of the purpose of ICCC-4 was to enable the cancer control community to integrate the conclusions of UN member states as stated in the final Political Declaration(UNGASS 2011) and to carry the work of the High Level Meeting forward towards the next stage as specified before the end of 2012.

As stated in the Declaration and cited above, important

debilitating and deadly chronic diseases, now usually termed non-communicable diseases, have many causes in common. This insight is well-established, and is reflected in the conclusions of two landmark UN reports published in 1990 and 2003 (WHO 1990; WHO 2003). It is also reflected in the recommendations of the two most authoritative reports specifically concerned with food, nutrition and the prevention of cancer, published in 1997 and 2007 (WCRF/AICR 1997; WCRF/AICR 2007). The expert committees responsible for both reports agreed that given the important common causal factors, which include smoking and other use of and exposure to tobacco, the interests of public health are best served by population and personal recommendations that also take obesity and other non-communicable diseases into account.

These reports recognize the essential importance of surveillance, screening, medical and surgical treatment, and palliative care. However, the term 'prevention' in these reports refers firstly to non-medical approaches, sometimes known as 'primordial prevention'. Translated into public policies and actions, this concept involves changing or protecting the circumstances in which populations and people live, so as to ensure that the risk of cancer – and other diseases – is minimized, and that the chances of good health and well-being are maximized.

This is done by identifying the principal types of determinants of disease, health and well-being, and by intervening on them by means of laws and regulations, fiscal policies, and changes to physical settings, in order to reduce exposure to risk factors (e.g., taxation on sugary drinks and tobacco products), increase exposure to protective factors (e.g., subsidies for fruits and vegetables and tobacco-free settings), and, ultimately, contribute to a better physical and living world.

These determinants are often termed 'the causes of the causes'. Social determinants are now well understood. These were the topic of a WHO world conference in Rio two weeks before the Congress (WHO, 2011d). Other types of determinants are also listed in the Political Declaration above. The insight that states of health and disease have economic and environmental as well as social, behavioural and biological – and other – causes is also well established, as published by UNICEF in 1998 (UNICEF, 1998) and by an expert working group in 2005 (Anonymous, 2005). Again, it is also reflected in the most authoritative report on the policy and action implications of prevention of cancer, published in 2009 (WCRF/AICR, 2009).

In the WCRF/AICR Policy Report, a rigorous attempt is made to apply the conceptual framework of the various and most important types of determinants of cancer at global, national, local and personal levels. Consideration is given to drivers of public health, such as economic globalization, climate change, urbanization, food systems, and social inequities. The report calls for the synergistic engagement of all relevant actors, including international bodies, government, civil society organizations, industry, the media, schools, workplaces and institutions, health and other professionals, and people as members of households and communities and citizens as well as individuals. The overall purpose is to generate rational policies and

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effective actions.

The findings of this Policy Report have been translated into executive summaries for Spanish Latin America, in partnership with the Pan American Health Organization (PAHO 2010); for Brazil, in partnership with the Brazilian National Cancer Institute (INCA 2009), and for the US, in collaboration with the American Public Health Association (WCRF/AICR 2010). A close collaboration has also been maintained with the Canadian Partnership Against Cancer (CPAC), with CPAC producing a Pan-Canadian policy framework report entitled "Canadian Priorities for Addressing Obesity as a cancer and Chronic Disease Risk Factor" (CPAC 2010), which in turn has led to follow-up actions in the areas of research, practice and policy.

A general conclusion of the 2009 Policy Report is that concerted collaboration between all relevant actors is required. There is an urgent and imperative need to make the whole concept of cancer prevention and control much broader, as agreed at the UN High-Level Meeting. The prevention of cancer, nationally and internationally, is as great a challenge and opportunity to us now, as that faced in Europe by the public health pioneers of the mid-19th century.

Workshops

1. Global Adult Tobacco Survey: Social Determinants of Tobacco Use in High Burden Low- and Middle-Income Countries Lead: **William Parra**

An efficient and systematic surveillance mechanism to monitor the epidemic of tobacco use is one of the essential components of a comprehensive global tobacco control effort. Tobacco surveillance is also emphasized in Article 20 (Research, surveillance and exchange of information) and Article 21 (Reporting and exchange of information) of the World Health Organization's (WHO) Framework Convention on Tobacco Control (FCTC)(WHO 2003). According to the data reported for the third round of the WHO's Global Tobacco Control Report (GTCR), only 57 of 193 Member States have recent, representative, and periodic tobacco use data for both adults and youth (WHO 2011c).

The Global Adult Tobacco Survey (GATS) was developed to meet this need by generating comparable data within and across countries (WHO 2011a). The GATS represents a standard for systematically monitoring adult tobacco use and tracking key tobacco control interventions. This nationally representative household survey of adults 15 years or older uses a standard core questionnaire, sample design, and data collection management procedures that were all reviewed and approved by a team of international subject-matter experts. The survey is intended to enhance the capacity of countries to design, implement, and evaluate tobacco control interventions.

To assist countries in meeting the FCTC requirements, WHO introduced MPOWER (WHO, 2011c), a package of selected demand reduction evidence-based measures

Monitor tobacco use and prevention policies
Protect people from tobacco smoke
Offer help to quit tobacco use
Warn about the dangers of tobacco
Enforce bans on tobacco advertising, promotion, and sponsorship
Raise taxes on tobacco

contained in the WHO FCTC.

The GATS represents the "M" in MPOWER and was launched as a household survey in early 2007, with a substantial grant from the Bloomberg Foundation. It is designed to produce national and sub-national estimates of tobacco use, exposure to second hand smoke, quit attempts among adults across countries, and indirectly measure the impact of tobacco control and prevention initiatives. Additional funding has since been provided for this project by the Bill & Melinda Gates Foundation.

To date, household surveys have been conducted in 2 phases in a total of 21 countries. The 21 countries represent 60% of the world's population 15 years and older, and represent 65.5% of the world's smokers. Approximately 360,000 household interviews have been conducted in 50 languages and dialects. Phase 3 is expected to be

> **Summary for Workshop 1**
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> • The Global Adult Tobacco Survey has been implemented in 21 countries that include two thirds of the world's smokers.
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> • Thailand reported that the data from the survey (currently being repeated for the second time) was aggressively used to strengthen each of the MPOWER components of tobacco control in the country.
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> • China reported that, despite the survey results, tobacco control is still a major challenge, particularly since the tobacco industry is a government monopoly

implemented in early 2012.

2.2. Diet, Including Alcohol, and Physical Activity: Risk Factors for Cancer and Non-Communicable Diseases
Leads: **Elisabete Weiderpass** and **Jeongseon Kim**

Cancer is largely a preventable disease. Studies have demonstrated that the food and drink that we consume, and the micronutrients that they contain, have the potential to modify the risk of many cancers. In addition, the amount of physical activity that we perform and, hence, our body composition, help to modify the risk of cancer. The evidence from these studies has been summarized and led to recommendations promoting a healthy diet and physically active way of life(WCRF/AICR 2007). However, an individual's ability to maintain a healthy diet and physically active way of life does not depend solely on their willingness and commitment. It also depends on many social and economic factors at the community,

regional, national and international level that can influence the safety, price and availability of food products as well as the neighborhood environment and how conducive it is to physical activity. The recognition of these factors led to the development of a set of recommendations for all sectors of society to promote policies and actions regarding food, nutrition, and physical activity to prevent cancer (WCRF/AICR 2009).

This workshop was undertaken to explore these issues of diet, alcohol, and physical activity, as modifiers of the risk of cancer. Oral presentations were selected to highlight the relationship between foods and micronutrients and the risk of cancer, as well as the factors that can affect whether individuals adopt a healthy diet.

Abstract 1: Folate, B Vitamins and Pancreatic Cancer Risk in the European Prospective Investigation into Cancer and Nutrition Study *Jin Young Park, Aurelie Moskal, Shu-Chun Chuang, Paolo Vineis, Nadia Slimani*

Folate plays an important role in the synthesis and methylation of DNA as a crucial cofactor in one-carbon metabolism. Inadequate folate intake has been linked to the risk of anaemia, neuropsychiatric disorders, neural tube defects, and cardiovascular disease. Furthermore, folate deficiency leads to disruption of DNA synthesis, repair and methylation, which may increase the risk of developing some cancers. Despite the proposed beneficial effects of folate on many different diseases, there has been growing concern regarding possible adverse effects of excessive levels of folic acid, the synthetic form of the vitamin, which may promote the progression of already existing malignant lesions. It is therefore important to understand folate exposure and the underlying mechanisms associated with its possible beneficial (dietary folate) or adverse (high dose of folic acid) effect on cancer, as a standalone nutritional component or as part of the complex one-carbon metabolism. Nevertheless, epidemiological evidence on folate intake and cancer risk in European countries has been limited, possibly due to the following methodological issues: lack of comparable and reliable information on folate intake across Europe; complexity of folate-mediated one-carbon metabolism; and limitations of a conventional approach considering a single nutrient/biochemical component in association with disease risk, especially in reflecting the multifactorial complexity of diet. The European Prospective Investigation into Cancer and Nutrition (EPIC) study, which includes half a million participants from 27 participating centres in 10 countries, offers a unique setting to evaluate dietary folate intake and its association with cancer while taking into account the methodological issues mentioned above. Results were presented from three different projects using the EPIC data: a comparison of standardised dietary folate intake across 10 countries; serum vitamin B profiles and their association with dietary intakes; and preliminary results on the association between nutrient patterns using 26 standardised nutrients and pancreatic cancer risk.

Abstract 2: Effect of Psychosocial Factors on the Healthy Diet of Korean Adults *Su Yeon Kye, Keeho Park*

Objective: The aim of this study was to determine the

relationships between consumption of a healthy diet and personality, impulsiveness, stress, sense of coherence, self-efficacy, and social support. Methods: In October 2009, a total of 1,530 South Korean volunteers who ranged in age from 30 to 69 years completed a questionnaire about dietary behavior, personality, impulsiveness, stress, sense of coherence, self-efficacy, and social support. Results: The overall prevalence of a healthy diet was 63.1%. Respondents were more likely to consume a healthy diet if they were older than 50 years, lived with a partner, had a monthly family income greater than $4,000 USD, had a less agreeable or conscientious personality, had low stress levels, had a high sense of coherence or self-efficacy, and had ample social support. Conclusions: Analysis of the factors that contribute to dietary intake could assist with the design of educational campaigns.

Abstract 3: Relationship between Breast Cancer and Common Non-Contagious Risk Factors in Iranian Women: an Ecologic Study* Hedayat Abbastabar, Parvin Hamidi fard, Farzad Jalilian

Background: Breast cancer is the most common cause of cancer-related deaths among women worldwide. Each year it is newly diagnosed in more than 1.1 million women in the world. North America has the highest age-standardized incidence in the world (99.4 per 100,000). Objective: The objective of this study was to determine possible risk factors for breast cancer in Iranian women. Methods: Data on common risk factors were gathered through surveillance from the Center of Non-Communicable Diseasesin Iran. Pearson correlation coefficients were calculated between the incidence of breast cancer between 1980-85 and common risk factors. Risk factors with statistically significant correlation coefficients were included in multiple linear regression models. Results: We found a positive correlation between breast cancer incidence and diabetes, fish consumption per week, the percentage of college education in the provinces and no consumption of fruit per week. We found a negative correlation between breast cancer incidence and no fish consumption per week, percentage of illiteracy in the provinces and fruit consumption perweek. Conclusion: We identified some possible modifiers of the risk for breast cancer, but the results must be interpreted with caution as this was an ecologic study and is subject to ecologic fallacy. Other studies, including cohort and case control studies, will be required to replicate these findings.
*This abstract was extensively edited for language, grammar, and interpretation.

Abstract 4: Relationship Between Colorectal Cancer and Common Non-Contagious Disease Risk Factors: An Ecologic Study* Hedayat Abbastabar, Parvin Hamidi fard, Farzad Jalilian

Background: Colorectal cancer is the world's fourth most common cancer in men and third most common cancer in women, but in Iran colorectal cancer is the third most common cancer in women and fifth most common cancer in men. Objective: To investigate the role of dietary factors, such as consumption of vegetables, fruits, dairy, fried foods, fish, salt, and other factors, such

as body weight, physical activity, hypertension, diabetes, smoking, educational level and marital status, in the development of colorectal cancer. Methods: Data on common risk factors were gathered through surveillance from the Center of Non-Communicable Diseases in Iran. Pearson correlation coefficients were calculated between the incidence of colorectal cancer between 1980-85 and common risk factors. Risk factors with statistically significant correlation coefficients were included in multiple linear regression models. Results: No correlation was found between colorectal cancer incidence and diabetes, hypertension, lack of or low mobility, higher education, and high consumption of dairy products, vegetables and fruits. A negative correlation was found between colorectal cancer incidence and high mobility, illiteracy, lack of consumption of dairy products and low consumption of vegetables and fruits. Conclusion: We identified some possible modifiers for colorectal cancer, but the results must be interpreted with caution as this was an ecologic study and is subject to ecologic fallacy. Other studies, including cohort and case control studies, will be required to replicate these findings.
*This abstract was extensively edited for language,

Recommendations from Workshop 2

• Non-communicable disease(NCD) prevention should engage all actors, working together in actions that will reduce NCD incidence and mortality. The actors, as specified in the 2009 WCRF/AICR Policy Report, are: people, health and other professionals, workplaces and institutions,media, civil society, schools, governments, industry and multinational bodies.

• Methodological tools to assess diet, alcohol intake and physical activity should be improved and further developed to allow results from studies throughout the world to be compared.

• For dietary intake, the Food Frequency Questionnaire (FFQ) is most often used in population surveys(Willett 1998), but most are lengthy and time-consuming(Glasgow, Perry et al. 1996). Thus, there is a need for a brief and cost-effective instrument to assess dietary intake which would not require specialized training for respondents or a lengthy interview process. A brief, valid and reliable FFQ would be useful for studies in specific populations, including the elderly and populations with lower education levels, and in a variety of settings, including community-based studies, large-scale epidemiologic surveys, rapid assessments in clinical practice, and nutrition education programs where immediate feedback could stimulate interest and increase motivation for dietary change. Targeted FFQs may also be useful for evaluating interventions designed to improve dietary habits (e.g., changes in fruit, vegetable, or fat intake) (Wakimoto et al., 2006)

grammar, and interpretation.

3. Infections and Cancer Lead: **Malcolm Moore**

An estimated 17.8% of the global burden of cancer can be attributed to infectious agents, with higher estimates in low and middle-income countries (26.3%) as compared to high-income countries (7.7%)(Parkin 2006). Infectious causes of cancer are primarily viruses (hepatitis B and C, human papilloma virus [HPV], Epstein-Barr virus, human immunodeficiency virus, human herpes virus 8 and human T-cell lymphotropic virus type I), but also include bacteria (*Helicobacter pylori*) and worms (liver fluke, schistosomes). They have been linked to many cancers, the most common being cancers of the stomach (*H. pylori*), liver (hepatitis B and C), cervix (HPV), head and neck (HPV), bladder (schistosomes) and nasopharynx (Epstein-Barr virus). Measures exist to prevent some of these infections and their negative sequelae, including antibiotics for *H. pylori*, screening for early detection of cervical cancer, and vaccines to prevent hepatitis B and HPV infection, but are available and implemented to varying degrees in different settings. If strategies could be devised to increase implementation and uptake of existing infectious disease prevention and control measures with relevance to cancer, particularly in low and middle-income countries, the burden of cancer could potentially be substantially reduced (Ullrich et al., 2011).

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Abstract 1: Population-Based Prospective Cohort Study on the Risk of High-Grade Cervical Intraepithelial Neoplasia or Worse Associated with Baseline Human Papillomavirus and Other Cofactors: *Shang-ying Hu, Fang-Hui Zhao, Na Zhao, Rong Li, Rong Zhang, He Xu, Ju-Fei Ma, Feng Chen, Xun Zhang, Qin-Jing Pan, You-Lin Qiao*

Objective: To assess the risk ratio (RR) of future cervical intraepithelial neoplasia grade 2 or worse (CIN2+) associated with baseline high-risk human papillomavirus (HR-HPV) infection and other cofactors. Methods: After being administered a questionnaire on risk factors, 1997 women aged 35-45 years were screened with 6 screening tests, including colposcopy, and underwent 4-quadrant biopsy and endocervical curettage in Xiangyuan County, Shanxi Province of China in 1999. In 2005 and 2010, women with biopsy-confirmed CIN1 or less at baseline were rescreened by liquid-based cytology, HPV DNA testing and visual inspection of acetic acid. Those with any positive screening test received colposcopic examination with directed or 4-quadrant biopsies. Cox proportional hazards models were used to evaluate the risk of incident CIN2+ related with baseline HR-HPV infection and other cofactors. Results: A total of 1486 (77.8%) women were followed up in 2010 (median follow-up time: 137 months). The cumulative incidence of CIN2+ at 11-year follow-up was 3.6%. The risk of incident CIN2+ in HR-HPV positive women at baseline was significantly higher than that in women negative for HR-HPV at baseline (adjusted RR=13.5, 95% CI: 7.2-25.2). RRs increased with the number of HR-HPV positive tests. Besides baseline HR-HPV infection, other risk factors for incident CIN2+ included parity, menopause, history of cervical erosion/chronic cervicitis and polyps. Risk factors for HR-HPV infection or having multiple HR-HPV positive tests included smoking history of women or their relatives, multiple sexual partners and history of cervical erosion/chronic cervicitis and polyps. Conclusion: This prospective study confirmed the extremely strong association between HR-HPV infection and incident CIN2+. It is meaningful to educate Chinese women to learn appropriate preventative measures for decreasing HPV related disease burden. Meanwhile, women with both HPV infection and other cofactors should be screened more frequently than others.

Abstract 2: The Association between Serum Interleukin 6 Levels and *Helicobacter Pylori* Antibody Levels among Japanese Outpatients: *Hiroko Nakagawa, Nobuyuki Hamajima*

Objectives: *Helicobacter pylori* (*H. pylori*) infection causes chronic inflammation resulting in the development of chronic gastritis, gastric ulcer and gastric cancer. Interleukin 6 (IL-6) is an inflammatory cytokine and could be associated with the immune reaction of *H. pylori* infection. The association between serum IL-6 levels and *H. pylori* antibody levels was examined. Methods: Subjects are 270 Japanese people without gastric cancer or ITP who visited a clinic in Nagoya, Japan, for *H. pylori* infection testing and subsequent eradication treatment between December 2005 and October 2010. They were examined by urea breath test and tested for serum levels of immunoglobulin G antibodies to *H. pylori*. The infection was defined by urea breath test (>2.5%). Those with IL-6>8pg/ml were excluded. Among the remaining 265 people, 162 subjects were found to be infected with *H. pylori*, 91 subjects were uninfected, and 12 subjects were unknown. The infection rate was 64.0% (162/253). The infected 162 people (55 men and 107 women) aged 23 to 78 years old were analyzed. Serum concentrations of IL-6 were measured by chemiluminescent enzyme immunoassay. The analysis was conducted by Stata version 11.1. Results: Serum IL-6 levels were correlated with *H. pylori* antibody levels (r=0.25, p=00014). Regression analysis for serum IL-6 levels was conducted to adjust for sex, age and *H. pylori* antibody. The regression analysis showed that serum IL-6 levels increased significantly with *H. pylori* antibody levels (β=0.0014, p=0.014). Conclusion: This study suggested that serum IL-6 levels were significantly associated with *H. pylori* antibody levels among *H. pylori* infected individuals, indicating that antibody levels might reflect the level of chronic inflammation

Abstract 3: Increased Risk of Pre-Malignant Cervical Lesions and High Grade HPV Infection among Rural Women Chronically Exposed to High Levels of Arsenic through Ground-Water in West Bengal, India: *Soma Roy Chowdhury*

Objective: Inhabitants of several districts in West Bengal state of India are facing severe arsenic contamination of groundwater. They are under the threat of arsenic-related diseases including cancers of lung, bladder, and skin. Since cervical cancer is the most common cancer among female populations of West Bengal and there were hospital

reports of an increased number of patients from arsenic districts, it was considered necessary to investigate the role of arsenic in increasing the risk of cervical cancer among chronically exposed women. Therefore, cervical screening was conducted among asymptomatic women living in high arsenic and arsenic-free villages in West Bengal state. Methods: The prevalence of cervical cancer, its pre-cancer lesions (CIN I-III), and high grade HPV infection was studied by conducting community based cervical screening among asymptomatic women aged 30-64 years from high arsenic (100 - 300μg/l) and arsenic-free (below 25μg/l) villages using VIA and VILI followed by colposcopic examination. A punch biopsy of suspected lesions was taken for histological evaluation. Presence of high grade HPV was determined using hybrid capture assay (HC-II) from screen positive cases followed by HPV genotyping. Results: Of the 1435 women screened from high arsenic villages, 148 were screened positive with 43 CINs (3.0%), 3 invasive carcinoma of the cervix (0.3%). Of the 1286 women from arsenic-free villages, 95 were screened positive with 21 CINs (1.6%) and 1 invasive cancer (0.13%). Prevalence of high grade HPV infection was 12.16% in high arsenic areas compared to 8.4% from arsenic-free areas. 21.7% of early lesions from high arsenic areas were CIN II/III whereas low arsenic areas showed no high grade CIN II/III. Conclusions: Results of the study indicate increased risk of pre-malignant cervical lesions and high grade HPV infections among women

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Summary for Workshop 3

• Approximately 18% of the global burden of cancer is attributable to infectious (communicable) agents. In certain countries/regions, infections are a dominant aetiology of cancer.

• For many infectious causes of cancer, there are preventative measures (vaccinations, hygiene, sanitation, water- security, food- security etc.), measures to identify those harbouring pre-clinical infection (HPV, HBV serology), those with pre-clinical cancer (cervical and endoscopic cytology), and those whose infections can be controlled by therapy (*H. pylori*, parasites, flukes).

• Cancer attributable to infectious diseases should be eliminated by concerted social, medical and political actions within a broader health and illness control program.

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chronically exposed to high arsenic levels.

4. Public Policies and Actions to Prevent Cancer: Lead: **Geoffrey Cannon**

This brief introduction should be read in conjunction with the introduction to the plenary presentation, with special reference to the Political Declaration of the UN High-Level Meeting on prevention and control of non-communicable diseases – see above (UNGASS 2011), and with the other references given here (WCRF/AICR 2007;

UN High-Level Meeting on NCDs: Political Declaration, Clauses 34, 36, 37 and 43

34. Recognize that prevention must be the cornerstone of the global response to non-communicable diseases.

36. Recognize that effective non-communicable disease prevention and control require leadership and multisectoral approaches for health at the government level, including, as appropriate, health in all policies and whole-of-government approaches across such sectors as health, education, energy, agriculture, sports, transport, communication, urban planning, environment, labour, employment, industry and trade, finance and social and economic development.

37. Acknowledge the contribution and important role played by all relevant stakeholders, including individuals, families, and communities, intergovernmental organizations and religious institutions, civil society, academia, media, voluntary associations, and, where and as appropriate, the private sector and industry, in support of national efforts for non-communicable disease prevention and control, and recognize the need to further support the strengthening of coordination among these stakeholders in order to improve effectiveness of these efforts.

43. Advance the implementation of multisectoral, cost-effective, population-wide interventions in order to reduce the impact of the common non-communicable disease risk factors, namely tobacco use, unhealthy diet, physical inactivity and harmful use of alcohol, through the implementation of relevant international agreements and strategies, and education, legislative, regulatory and fiscal measures,

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INCA 2009; WCRF/AICR 2009; PAHO 2010; WCRF/AICR 2010).

This workshop was not concerned with new research findings and evidence. Its task was to make sense of the established and emerging evidence, and also areas relevant to public policy where evidence is necessarily preliminary. The scope of this workshop was wider than that of the examples given in the plenary, touching on all the main immediate causes of cancer, including specific topics of the other workshops being held at the same time: smoking and use of and exposure to tobacco; diet (including alcohol) and physical activity; and infections. Occupational exposures and contamination and pollution can also be considered.

Like the others, this was a brief workshop. Participants were invited to imagine that their task was to make recommendations to legislators and other policy-makers that in all relevant circumstances would be most likely to succeed and to have the greatest impact. Participants were also invited to work within the framework of the UN High-Level Meeting Political Declaration cited above, or else

to range wider. The workshop encouraged engagement of Congress participants with some experience in formulating evidence-based policies on which measurable actions can be based.

Participants were also encouraged to come to the workshop already familiar with the WCRF/AICR 2007 Diet and Cancer Report (WCRF/AICR 2007) and the 2009 Policy Report (WCRF/AICR 2009), relevant executive summaries of the Policy Report, or other international or national documents on public health policies and actions designed to prevent and control cancer. Participants from Asia, Latin America, Canada and the US were asked to familiarize themselves with the priority policy and action recommendations listed in these executive summaries.

The aim of the workshop was to agree on a list of policies and actions which, in the opinion of participants are most likely to prevent and control cancer worldwide. These did not include the well-established policies and practices of screening, detection, treatment and care, with which cancer control professionals are already familiar.

Abstract 1: Big Snack Follows Big Tobacco Steps to Cheat On You *Fabio Gomes*

It is now widely accepted that the marketing of energy-dense foods, snacks, and drinks is an important cause of the rapid rise of overweight and obesity, and raises the risk of related diseases in early and later life. Successful examples from restrictive measures on tobacco control indicate how pressing is the need to reduce demand of all products that are clearly distal, or proximal causes of several types of cancer. Brazil exports a successful example on tobacco control focused on three major action points: publicity (regulation of the stimuli for demand), price (taxation to create a financial barrier), and place (interventions reducing the physical access to products). As this approach applies to any product that produces health problems in a public health dimension, the National Cancer Institute of Brazil is taking similar steps to protect the greater share of cancer protective foods from the advance of highly processed foods into the Brazilian diet. This paper highlighted how the use of law and mandatory regulations creates a more favourable scenario for preventing cancer throughout the life cycle,

showing the successful strategy from tobacco control, and the current steps and struggles faced now by the food and nutrition field. In the case of food and nutrition, this is done by regulating publicity and propaganda (to regulate the stimuli for demand), price (taxation to create a financial barrier to unhealthy products and subsidies for the healthy ones), place (interventions to reduce the physical access to products) and product (reformulation of products to reduce some unhealthy nutrients). As in the tobacco arena, some initiatives in the field of food and nutrition have been undermined and/or impeded by the food and media industry. Others are having difficulties getting statutory regulations implemented and avoiding amendments from the private sector that make them less stringent.

Conclusions

This first session of ICCC-4 broke new ground. It accepted a conceptual framework for cancer prevention and control that incorporates and goes far beyond the medical model. Instead, it put cancer in the context of other non-communicable diseases, as a vast global public health issue. Seen in this way, the determinants of cancer risk are social, economic and environmental, as well as biological and behavioural. This 'big picture' thinking is familiar to all who work in the field of tobacco control. It is well understood that policies and actions designed to reduce the incidence of cancers caused by use of and exposure to tobacco include legislation and other regulation as well as information and education. Similar approaches that address exposure, availability or affordability will also reduce incidence of cancers whose risk is modified by other factors, such as food, nutrition, alcohol, body mass, physical activity, infectious agents, and occupational and other exposures. A vital task for policy-makers now, is to determine which approaches are most rational and likely to be most effective, at international, national and local levels.

Acknowledgements

Recommendations from Workshop 4

• Create and develop an international network using a web-based platform, whose purpose is to identify relevant actors and to collect, analyze and evaluate policies, laws, regulations and plans relevant to cancer prevention and control and the promotion of good health and well-being.

• Devise economic models that advantage locally produced, distributed, sold and consumed fresh and minimally processed foods, and disadvantage the manufacture, promotion, distribution, sale and consumption of ultra-processed products high in fat, sugar or salt made by transnational corporations.

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