european cancer ORGANISATION

Primary Prevention:

United for Action

Prevention, Early Detection and Screening Network

The Prevention, Early Detection and Screening Network is one of the European Cancer Organisation's Focused Topic Networks, established as part of our Strategy for 2020-2023. The Prevention, Early Detection and Screening Network was launched in July 2020.

More information is available on our website.

If you would like to find out more about the Prevention, Early Detection and Screening Network, please contact us at: info@europeancancer.org

Member
SOCIETY OF THE EUROPEAN CANCER ORGANISATION

Patient
ADVOCACY GROUP OF EUROPEAN CANCER ORGANISATION

Community 365
INITIATIVE OF THE EUROPEAN CANCER ORGANISATION

Contents

Acknowledgements

This document was produced by European Cancer Organisation's Prevention, Early Detection and Screening Network. It was compiled via a number of processes of outreach and consultation with European Cancer Organisation's Member Societies, Patient Advisory Committee and Community 365[a], in particular with participants in the Prevention, Early Detection and Screening Network and in line with the European Cancer Organisation's policy decision-making process.

Principal Authors

Matti Aapro, President, European Cancer Organisation
Rui Medeiros, President, Association of European Cancer Leagues
Isabel T Rubio, Co-Chair, European Cancer Organisation's Prevention, Early Detection and Screening Network
Jan Van Meerbeeck, Co-Chair, European Cancer Organisation's Prevention, Early Detection and Screening Network
Norbert Couespel, Policy and Research Officer, European Cancer Organisation

Coordinators

Agnese Abolina, Communication and Community Manager, European Cancer Organisation
Richard Price, Head of Policy, European Cancer Organisation

Contributors

Enormous thanks are due to all speakers and participants at the high-level **meeting on Primary Prevention** held on 28 May 2021, who gave their time to contribute a range of excellent reference materials, informed insights, practical examples and policy advice. This report seeks to reflect a summary of the key points of exchange and headline recommendations, as well as of connected discussions with participants to the Prevention, Early Detection and Screening Network and other experts, including:

Aron Anderson, World Health Organization
Cynthia Aristei, University of Perugia and Perugia General Hospital, Perugia, Italy
Monika Arora, World Heart Federation
Thomas Berg, European Association for the Study of the Liver
Brigitta Boonen, European Society of Skin Cancer Prevention
Abenaa Brewster, American Society of Clinical Oncology
Delia Cortés Guiral, European Society of Surgical Oncology
Anil D'Cruz, Union for International Cancer Control
Johann De Munter, European Oncology Nursing Society
Carolina Espina, International Agency for Research on Cancer
Carina Ferreira-Borges, World Health Organization
Lewis Foxhall, MD Anderson Cancer Center, Houston, TX
Rüdiger Greinert, European Society of Skin Cancer Prevention
Jonathan Grigg, European Respiratory Society
Swen Malte John, European Academy of Dermatology and Venereology & Internation Commission on Occupational Health

a Community 365 is group of charity, philanthropy and industry contributors to the Focused Topic Networks of the European Cancer Organisation. Community 365 provide ideas, guidance, practical support and resources for our work in convening stakeholders and building consensus in the European cancer community. Community 365 contributors do not have a decision-making role in our policy work. Rather, policies of the European Cancer Organisation, such as those represented in this document, are agreed by our Board after consultation with our Member Societies and Patient Advisory Committee, via our Policy Pathway process. More information here: www.europeancancer.org/community-365

Iris Lansdorp-Vogelaar, Digestive Cancers Europe

Jennifer Lyn Baker, European Association for the Study of Obesity

Yoanna Nedelcheva, European Association for the Study of the Liver

Demosthenes Panagiotakos, European Society of Cardiology & European Association of Preventive Cardiology

Markus Peck-Radosavljevic, United European Gastroenterology

Joachim Schüz, International Agency for Research on Cancer

Lena Sharp, European Oncology Nursing Society

Alexander Stratigos, European Academy of Dermatology and Venereology

Mariano Suppa, European Academy of Dermatology and Venereology

Jane Turner, International Psycho-Oncology Society

Schlomo Vinker, World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians - Europe (WONCA Europe)

Marzia Zambon, EUROPA DONNA

Suggested citation: Aapro M, Medeiros R, Rubio IT, Van Meerbeeck J, Couespel N (2021). Primary Prevention: United for Action. European Cancer Organisation; Brussels.

Executive Summary

Each year, millions of people across the European region develop cancer, causing a heavy burden on individuals and their families, healthcare systems, governments and wider society, not to mention the impact in terms of lives lost. Yet 40% of all cancers are preventable. 20% of European cancer cases are attributable to tobacco consumption, 8% to alcohol, and further 5% each to an unbalanced diet and being overweight or obese, while another 2%–3% are linked to harmful ultraviolet exposure. Additional cancer causes and risk factors include infections by Human Papillomaviruses (HPV), Hepatitis B and C viruses (HBV & HCV) and *Helicobacter pylori*; exposure to ionising radiation; air, water and food pollution; and occupational exposure to carcinogens.

There is ample evidence to show not only that tobacco is a leading cause of more than ten types of cancer but also that healthcare policies aimed at smoking cessation are effective at reducing the incidence of the disease. Yet there remain many areas in Europe where much work needs to be done to bring down smoking rates, and where citizens are still exposed to secondhand smoke. Efforts are being undermined by the tactics of the tobacco industry, which is trying to sow confusion around the idea of harm reduction, rather than reducing tobacco use.

Alcohol consumption is associated with seven major cancers, including breast, liver, colorectal, and laryngeal cancers. Research has shown that drinking is associated with risk, and increased consumption increases the risk. Consequently, there appears to be no safe level of alcohol consumption, and effective polices must be introduced to increase taxes on alcohol products, ban or at least restrict alcohol marketing, introduce warning labels and restrict its availability, among other measures. The need for this is underlined by the low levels of knowledge of the harms of alcohol compared with those for tobacco.

The association between diet, lifestyle and cancer mirrors that for cardiovascular disease, with emerging evidence of a shared aetiology between the two diseases. There are a range of known dietary carcinogens but also obesity is a major contributor to cancer risk via patterns of chronic inflammation. Moreover, obesity is itself associated with 13 types of cancer. Controlling dietary habits could help reduce the risk of both cancer and cardiovascular disease, with the healthiest lifestyles associated with an approximate 30% reduction in cancer incidence. Key to this will be the involvement of family physicians and cancer nurses in education and prevention. The role of better treatment of obesity as a means of improving cancer prevention should be emphasised.

Between 75% and 95% of melanomas of the skin are preventable through changes in individual sun-seeking behaviour and the provision of shaded environments, protective clothing and sunscreen in at-risk of environments. Another key area is that of sunbeds, which are associated with substantial increases in skin cancer risk, especially in those who start using them at a young age. Yet legislative measures in Europe on sunbed use remain insufficient. Achieving real change in reducing harmful ultraviolet exposure will require harmonised guidelines and communication, prevention policies in communities, schools and companies, and effective policies to limit or ban sunbed use for cosmetic purposes.

The evidence is available and the path is clear. The time is now for action.

Introduction

By Matti Aapro, President of the European Cancer Organisation and Rui Medeiros, President of the Association of European Cancer Leagues

During the consultation period for Europe's Beating Cancer Plan,[1] European Cancer Organisation representatives held many discussions with organisations working in oncology, cardiology and other areas of healthcare. These conversations followed a meeting held with the EU Commissioner for Health and Food Safety, Stella Kyriakides, last year, where it was agreed that it was extremely important that Europe's Beating Cancer Plan brings together the excellent existing work of many stakeholders to improve public health.

As a result, we agreed to co-chair a meeting designed to share existing initiatives, so that this work can be amplified and potential collaborations explored, beyond the important work already undertaken by the Association of European Cancer Leagues and the European Cancer Organisation's **Prevention, Early Detection and Screening Network** and others of our **Focused Topic Networks** addressing primary cancer prevention issues, such as those on **HPV Action** and the **Cancer Workforce**.

The resulting Primary Prevention Meeting was held on 28 May 2021. It was joined live from Stockholm by Aron Anderson, Cancer Ambassador for Europe with the **World Health Organization**, who gave a moving and inspiring call to arms to strengthen our efforts in primary prevention and reduce the risk of individuals developing cancer.

Aron is a professional adventurer with a difference, in that he does all of his adventures from a wheelchair. He was diagnosed with sarcoma in his lower back at seven years of age and looking back 25 years on he said that, fighting cancer at that age, he could never have imagined he could have ended up with the life he has today.

Aron was lucky enough to get a second chance, but the major impact that his childhood cancer had on him made him decide to make the most of his life. But what is the connection with preventing cancer? He explained that there are many things that can be done by the individual to reduce their risk of developing cancer, centred around smoking, diet, sun safety and radiation, obesity, alcohol and exercise, but he has only been able to achieve the seemingly 'impossible things' that he has done in his life thanks to one key factor: outside support.

People are often blamed for their behaviours, but Aron believes that there needs to be more focus on the team effort. He needed a team around him to help him cycle from Stockholm to Paris, and in the same way preventing cancer needs healthcare professionals, policymakers and governments to, for example, act on smoking, develop places in cities to promote exercise and work on supportive legislation, to be part of the team supporting individuals to make lifestyle changes.

With Aron having so perfectly set the stage, the European Code Against Cancer (ECAC),[2] a key tool in the prevention of cancer, was discussed. Now in its fourth edition, it aims to inform the public about actions they can take for themselves and their families to reduce their risk of cancer. Rui Medeiros, President of the Association of European Cancer Leagues (ECL), emphasised the key needs in communicating the European Code Against Cancer to citizens, and the leading work of ECL in this task.

The ECAC consists of twelve messages that most people can follow without any special skills or advice. The more messages people follow, the lower their risk of cancer, which is important as an estimated 40% of cancers are preventable. The messages concern tobacco (direct and secondhand exposure), body mass, physical activity and nutrition, alcohol and ultraviolet (UV) and other radiation exposure, alongside breastfeeding, vaccinations and cancer screening.

Crucially, the ECAC is a trusted, evidence-based tool that is free of commercial influence. It provides the most reliable synthesis of the available evidence on cancer prevention, and as well as being a tool for improving cancer literacy, it is used for health policy development.

In both of those senses, the ECAC was consequently a theme that ran throughout the Primary Prevention Meeting. We heard in sessions on tobacco and alcohol control, diet and lifestyle changes to prevent cancer through obesity treatment and

UV protection, and from experts right across the spectrum of cancer advocacy, the same message time and again: millions of preventable cancer cases are diagnosed every year in Europe, leading to lives lost needlessly.

And yet the evidence for prevention is there. We know what we need to do and now we have to translate that knowledge into action if we are to align healthcare, policy development, government action and Europe-wide collaboration to turn the tide in the prevention of cancer.

To find out more about the Meeting and access videos, documents or resources on the topic of Primary Prevention, shared by the participants of this meeting, visit our **Primary Prevention Hub**.

Did you know?

- 40% of all cancers are preventable
- Cancer causative and risk factors include tobacco, alcohol, unhealthy diet, overweight and obesity and harmful ultraviolet exposure, but also infections, ionising radiation, pollution and occupational exposure to carcinogens
- The European Code Against Cancer is a trusted, evidence-based tool, providing citizens with twelve key messages to reduce their cancer risk

Find out more

- European Cancer Organisation:
  - » **Prevention, Early Detection and Screening Network** and **Primary Prevention Hub**
  - » **Strengthening Europe in the fight against cancer**: Study commissioned by the European Parliament's ENVI Committee to the European Cancer Organisation
- World Health Organization Europe: Information on the **WHO/Europe Cancer Ambassador**
- Association of European Cancer Leagues: Information on the **European Code Against Cancer** on the website of the Association of European Cancer Leagues

A Tobacco-free Europe: Reaching our Destination Faster

The opening session of the meeting began with an examination of the available research and evidence to guide action on tobacco control.

Carolina Espina, a scientist in the Section of Environment and Radiation at the **International Agency for Research on Cancer** (IARC), explained that tobacco, which kills up to half of long-term users, is the leading cause of preventable cause of death and cancer globally.

Studies have shown that, although there is a degree of variation across Europe, smoking contributes to 20% of all cancers in the region and half of preventable cancers, which translates into approximately 750,000 preventable cases of cancer each year.[3,4] Smoking is the primary cause of over ten types of cancer, and 82% of all lung cancers are due to smoking.

There is much lower awareness of the risks associated with smokeless tobacco, which is associated with cancers of the oral cavity, oesophagus and pancreas, while the impact of others forms of tobacco consumption, including waterpipes, shisha and hookah, is poorly understood.

Secondhand smoke remains a major cause of lung cancer in non-smokers, as they are exposed to it when they breathe in, and metabolise similar carcinogens to active smokers.

Systematic data collection is needed to tackle tobacco consumption, as it can be used to inform evidence-based policies. The IARC has led in this area, producing a series of monographs on the identification of carcinogenic hazards to humans, and several handbooks on cancer prevention. In addition, the IARC provided the backbone of the data for the European Code Against Cancer, the first two recommendations of which concern tobacco.[2]

There is sufficient evidence that smoking is carcinogenic, and yet 27% of adults, or 31% of men and 24% of women, still smoke in Europe, and 2% of the population consume smokeless tobacco, rising to 3% in Finland, 4% in Poland and 21% in Sweden. There is also sufficient evidence that secondhand smoke is carcinogenic to the lung, and yet there are still places in Europe where smoking is allowed in enclosed spaces.

Prevention works, but it requires time and vision. Addressing tobacco use is critical and it requires a suite of interventions. Evidence from the UK and Poland has shown that the implementation of tobacco control policies is accompanied, several years later, by reductions in lung cancer mortality. Countries across Europe have implemented such policies in recent decades, and they have all seen reductions in smoking prevalence as a result.[5,6] Similarly, studies indicate that tobacco control measures implemented in Australia, such as the "plain packaging" initiative, graphic health warnings on cigarette packets, and holding cigarettes in a locked cabinet "behind the counter", likely leading to reductions in smoking.[7,8]

Crucially, substantial cancer prevention is achievable with tobacco control, and evidence-based effective interventions to control tobacco use already exist at the individual and population level.

Anil D'Cruz, President of the **Union for International Cancer Control** (UICC), said that their organisation is committed to tobacco control and it is an important part of their work across advocacy, convening and capacity-building.

The reason why it is a major focus is that, globally, tobacco is responsible for eight million deaths, including 1.2 million from secondhand smoke and three million from cancer. Of the 1.3 billion smokers worldwide, 80% live in low and middle income countries, and the habit is responsible for increasing poverty and discrepancies within and between countries.

The UICC aims to synergise efforts towards tobacco control by identifying and engaging stakeholders, including the health community, governments and the public, share knowledge and raise awareness, and build expertise in communities. Through this, they advocate with government, engage the community, counter the lobbying efforts of the tobacco industry and demonstrate the benefits of investment in tobacco control.

The key approaches of their tobacco control work are evidence-based advocacy, connecting and engaging across the spectrum of society and healthcare, and raising awareness. The key focus areas are tobacco taxation, tobacco advertising, promotion and sponsorship, and the creation of smoke-free environments.

To those ends, the UICC has created a series of resources, blogs, videos, virtual dialogues and infographics on the theme of tobacco control, and is running a ready-made social media campaign for the World Health Organization's **World No Tobacco Day**.

By understanding the determinants of tobacco consumption, engaging stakeholders and increasing knowledge, supporting policy development and implementing cost-effective and efficient measures, there will be a decrease in cancer deaths and tobacco-related diseases. Investment in prevention measures will increase people's health and wealth and relieve the burden on health systems, which will in turn increase national health and provide economic benefits.

A coordinated multi-sectorial, multi-stakeholder approach will be beneficial for smokers, the public and countries as a whole by raising low tobacco prices and taxes, addressing gaps in the law, tackling the lack of political will for change, and countering industry lobbying and advocacy.

Jonathan Grigg, Chair of Tobacco Control Committee at the **European Respiratory Society** (ERS) spoke next on meeting the challenge of e-cigarettes and other novel heated tobacco products. These are put forward as part of efforts to reduce the harm from tobacco.

In general, harm reduction strategies aim to reduce the adverse health, social and economic consequences of the use of psychoactive drugs without necessarily reducing drug consumption. They prioritise a public health perspective aimed at stopping or reducing immediate harms when at-risk individuals do not respond to treatment.

Tobacco harm reduction strategies recommend the use of alternative nicotine delivery products, such as e-cigarettes, to smokers due to their reduced toxicity compared with conventional cigarettes.

In so doing, they replace a harmful product with another less but still harmful product. This concept is intuitive and attractive, and has been promoted by the tobacco industry and adopted by leading public health bodies in, for example, the UK, but it is more complex in reality.

The ERS believes that tobacco harm reduction cannot be recommended as a population-based strategy as the new products, which are aimed at consumers and mass-marketed by the tobacco industry, are not as harmless as commonly believed and are not highly effective as smoking cessation tools. Moreover, the majority of smokers want to quit and dislike being nicotine dependent. Tobacco harm reduction can also have a negative impact on public health and youth in particular, and is not necessary to curb the tobacco epidemic.

In terms of their potential harms, there is increasing evidence that electronic cigarettes are associated with acute lung injury, an increased risk of cardiovascular diseases and lung disorders, adverse effects on foetal development, and a potential link with cancer growth and development. Heated tobacco products are associated with potential damage to bronchial epithelial cells, increased oxidative stress and inflammation, infections and airway remodelling. There is also a potential link with decreased blood vessel function. For both electronic cigarettes and heated tobacco products, the long term effects are unknown.

As for nicotine itself, it is associated with an increased risk of diseases such as diabetes, has effect on adolescent brain development, confers a future risk of addiction to other drugs when used during adolescence, and has toxic effects on foetal development.

The tobacco industry has adopted seven strategies to sow confusion in the realm of tobacco control policy,[9] consisting of promoting untruths, playing the victim, playing the European Commission off against member states, preying on third countries, postponing regulation, protesting against regulators and pushing new technologies.

However, the ERS cannot recommend any product that damages the lungs and human health, and the focus should be on promoting evidence-based and effective regulatory measures to reduce smoking and continue to support smokers who want to quit.

Did you know?

- Tobacco smoking is the leading preventable cause of cancer and causes 8 million deaths globally each year
- Tobacco smoking is responsible alone for 20% of cancer cases and 750 000 annual cancer diagnoses in Europe; yet 27% of European adults smoke tobacco
- Tobacco smoking contributes to poverty and inequalities, with 80% of tobacco smokers living in Low or Middle Income Countries
- There is sufficient evidence that both tobacco smoking and secondhand smoke cause cancer
- The majority of tobacco smokers want to quit and dislike being nicotine dependent
- Nicotine itself is also associated to a broad range of diseases, toxicities and health disorders

Key policy recommendations

- Substantial cancer prevention can be achieved with further tobacco control
- Existing evidence-based effective interventions to control tobacco at the individual and at the population-level need to be implemented
- A coordinated multi-sectorial, multi-stakeholder approach is needed between smokers, the public and countries by raising low tobacco prices and taxes, addressing gaps in the law, tackling the lack of political will for change, and countering industry lobbying and advocacy.
- Priority must be given to evidence-based and effective regulatory measures to reduce smoking and support to smoking cessation efforts over tobacco harm reduction, which can have detrimental impacts on public health and the youth in particular.

Find out more

- The International Agency for Research on Cancer:
  - » **European Code Against Cancer**
  - » **Monographs on the identification of carcinogenic hazards to humans**
  - » **Handbooks on cancer prevention**
- The Union for International Cancer Control:
  - » **Information on Tobacco control activities**
- The European Respiratory Society:
  - » **Tobacco Control Committee**

Action on Alcohol: New Windows of Opportunity

Carina Ferreira-Borges, Head and Programme Manager at the **World Health Organization** (WHO) European Office for Prevention and Control of Non-Communicable Diseases, kicked off the next session, which was on alcohol control.

The latest data showed that harmful consumption of alcohol is associated with three million deaths every year, which equates to six deaths every minute. Three quarters of those deaths occur in men and a quarter in women. The vast majority of countries where alcohol consumption rates are at their highest are in Europe, and it is estimated that there are one million deaths related to alcohol in the WHO European Region every year.

The WHO European Region has the highest proportion of deaths and disability-adjusted life years caused by alcohol in the world. In 2016, approximately 2545 people died every day from alcohol-attributable causes. This meant that every tenth death in the European Region was attributable to alcohol, rising to almost one in four deaths among people aged 20–24 years.

Moreover, alcohol consumption is associated with an increased risk of cancer, and the WHO estimates that, in 2018, 180,000 cancer cases and 92,000 cancer deaths in the European Region were caused by alcohol. Alcohol is most commonly associated with cancers of the oral cavity, oropharynx, larynx, oesophagus, breast, liver and colorectum.

People who use both alcohol and tobacco have a five-fold increased risk of developing cancers of the oral cavity, oropharynx, larynx and oesophagus compared to people who use either alcohol or tobacco alone, and this risk is up to 30 times higher in heavy users of these toxic agents.

While heavy drinking accounts for 51% of alcohol-related cancers at all sites, 61% of oral cavity cancers, and 29% of breast cancers related to alcohol, even moderate drinking accounts for 11% all alcohol-related cancers, 9% of oral cavity cancers and 25% of alcohol-related breast cancers.

Overall, 49% of alcohol-related cancers are not related to heavy drinking, which suggests there is no safe level of alcohol consumption. Public health messages must be tailored to the dangers of alcohol, and respond to population-based harms.

Alcohol-attributable cancers and deaths can be prevented by reducing alcohol consumption, and using effective policies to increase taxes, banning or restricting alcohol marketing and restricting availability. These general population strategies are highly effective, cost-effective and easy and inexpensive to implement, and considered by the WHO as 'best buys'. Other strategies that are effective and cost-effective include drink-driving countermeasures, screening and brief interventions, and the treatment of alcohol use disorders. Other, environmental strategies include education, registration of all alcohol, including industrial alcohol, and informal controls.[10]

To reduce the harms from alcohol in the European Region, the WHO is leading the SAFER initiative, which has five action areas:[11]

- Strengthen restrictions on alcohol availability
- Advance and enforce drink-driving countermeasures
- Facilitate access to screening, brief interventions and treatment
- Enforce bans or comprehensive restrictions on alcohol advertising, sponsorship and promotion
- Raise prices on alcohol through excise taxes and pricing policies

The 2013–2020 WHO Global Action Plan for Prevention of NCDs also called for a 10% relative reduction in the harmful use of alcohol.[12]

Above all, reducing alcohol consumption is a public health initiative that requires increased recognition of alcohol's contributory role in cancer development and cancer death. There is a need for interconnected measures that underline the lack of a safe level of drinking, and involve concerted action at a national and international level, including combating the influence of vested interests opposed to alcohol control policies.

There also needs to be increased levels of political commitment and implementation of a comprehensive policy approach, with an emphasis on the WHO's 'best buys' in terms of policy options. Finally, appropriate and widespread engagement of public health-oriented nongovernmental organisations, professional associations and civil society groups is required.

Abenaa Brewster, Professor of Clinical Cancer Prevention at MD Anderson Cancer Center, Houston, Texas, representing the **American Society of Clinical Oncology** (ASCO), explained that the International Agency for Research on Cancer classifies ethanol in alcoholic beverages and acetaldehyde as human carcinogens.

They are associated with DNA, protein and lipid alteration and damage, oxidative stress, inflammation, nutritional malabsorption, immune dysregulation, and increased oestrogen levels, leading to breast cancer,[13] and meta-analyses have confirmed the link between alcohol consumption and the development of a range of cancers.

A recent national US National Health Interview Survey of adults with cancer showed that 56% of cancer patients reported being current drinkers, 34% exceeded moderate limits of one drink per day among women and two drinks per day among men, and 21% engaged in binge drinking.[14]

Alcohol abuse is associated with comorbid psychiatric conditions, which could affect treatment adherence and quality of life,[15] and heavy use is associated with malnutrition and could increase susceptibility to bacterial infections. There is also data to suggest that heavy alcohol use is associated with postoperative complications, worse surgical outcomes and longer hospitalisations,[16] as well as an increase in cardiovascular risk, liver dysfunction and neuropathy, potentially complicating systemic treatment choices and guideline adherence.[17] Alcohol use is also known to be a very frequent comorbidity in people who are depressed, which is common among cancer patients. This highlights the need for distress screening, which will offer a double benefit, by allowing to offer treatment to identified depressed people, and in turn to mitigate alcohol use.[18]

Despite this, more research is needed on the mechanistic effects of alcohol on tumour biology and the efficacy of cancer treatments, including radiotherapy, chemotherapy and immunotherapy and surgery, as well as the impact of alcohol on quality of life, as the majority of research has focused on breast, colorectal and upper aerodigestive tract cancers and the risk of recurrence and death.

Given the high prevalence of alcohol use among cancer survivors, increased public awareness of the impact of alcohol is required.

Lewis Foxhall, also from MD Anderson Cancer Center, noted that the evidence for primary prevention is already there and if only healthcare systems and governments could respond to the research that has already been done, cancer incidence and mortality would be reduced significantly. The problem is often in the understanding, the awareness and the delivery of the sorts of interventions that are important to make a difference.

One problem is that political will comes up against health-related policies, sometimes for the better, sometimes for the worse. The key is to recognise the opportunities that are already there, especially for tobacco, which is the single most important modifiable risk factor for a number of cancers and also impacts recovery and survivorship, but also for alcohol.

It has to be borne in mind that both tobacco and alcohol are significant contributors to the cancer burden, but have traditionally been sold and promoted to the public and have entire industries behind them, which makes it even more difficult to enforce their control.

There have been many missed opportunities so it is doubly important that organisations such as ASCO and the European Cancer Organisation work together, as well as with governments, to identify what can be done to intervene that's practical and effective, and bolster educational efforts to amplify their impact.

Monika Arora, Director and Professor-Health Promotion Division, Public Health Foundation of India, representing **World Heart Federation**'s Advocacy Committee, said that 72% of women and 83% of men consume alcohol in high income countries, compared with just 9% of women and 20% of men in low and middle income countries.[19]

The total number of deaths due to alcohol-related cancers has been increasing steadily in recent years, and recent evidence suggests that pancreatic and prostate cancer can be added to the list of cancers known to be associated with alcohol use. It is important to emphasise that, for each associated cancer, the more alcohol a person consumes, the higher the cancer risk.

The economic burden of alcohol use is also high, with high and middle income countries spending 1% of their gross domestic product on

alcohol-attributable costs such as healthcare and out-of-pocket expenditure for the treatment of comorbidities. Globally, 10.3 million cancer disability-adjusted life years are lost due to alcohol use.

Worldwide, there is low awareness of the association between alcohol use and cancer, lower than that for tobacco and cancers, making effective general population strategies a must. Arora called for price increases for alcohol via taxation, decreased availability via a ban on buying alcohol in supermarkets and an increase in the minimum drinking age, and a ban on alcohol marketing, advertising and sponsorship.

Isabel Rubio, President of **EUSOMA** and Co-Chair of the European Cancer Organisation's Prevention, Early Detection and Screening Network, discussed how much is too much when it comes to alcohol.

Previous studies have shown that between three and six alcoholic drinks per weeks is associated with a 15% increased risk of breast cancer, as well as the risk of breast cancer recurrence. One alcoholic drink per day is linked to a 10% increased risk of liver cancer, while the risk of oral, pharyngeal, oesophageal, colorectal and laryngeal cancers all increase with increased consumption.[20,21] In contrast, an intake of one to less than five drinks per week is associated with the lowest combined risk of cancer or death.[22]

In terms of raising awareness of the risk of consuming alcohol, a study showed that applying cancer warning labels to alcoholic beverages at a shop in Canada increased support for alcohol policies, and could be an effective population-based strategy for increasing awareness and knowledge of national drinking guidelines.[23,24]

Other factors related to breast cancer incidence include overweight, obesity, a sedentary lifestyle, smoking and hormonal replacement therapies, added Cynthia Aristei, University of Perugia and Perugia General Hospital, Perugia, Italy. In particular, observational studies have shown that pre- and post-diagnosis physical activity reduces the mortality risk not only in breast cancer but also in colorectal cancer.

Thomas Berg, Vice Secretary of the **European Association for the Study of the Liver** (EASL), spoke next, underlining with Yoanna Nedelcheva that primary liver cancer is the sixth most commonly diagnosed cancer and was the third leading cause of cancer death worldwide in 2020, with 906,000 new cases and 830,000 deaths.[25]

In Europe, there were approximately 87,000 new cases of liver cancer in 2020, at an average age-standardised annual incidence rate of 5.2 per 100,000 person years. It is estimated that around 78,000 individuals died as a consequence of liver cancer in Europe in 2020.[25]

The latest data also show that hepatocellular carcinoma (HCC) is currently one of the few cancers for which the incidence and mortality are increasing, with a 70% increase in liver cancer-related deaths in the European Union from 1990 to 2019.[26] This is despite most liver diseases being highly preventable and the at-risk population groups being well identified.

Liver cancer can be effectively prevented by reducing liver disease and its progression. Most people have an underlying liver disorder, including infection with hepatitis B or C viruses, cirrhosis, non-alcoholic fatty liver disease (NAFLD), in which fat builds up in the liver, and nonalcoholic steatohepatitis, a condition in which fat builds up in the liver along with inflammation and liver cell damage. Heavy drinking is also a risk factor for HCC; excessive drinking is one of the main causes of cirrhosis and can also cause alcoholic fatty liver disease. Cigarette smoking is also a potential risk factor for HCC.

There are also several rare metabolic, genetic, and autoimmune liver diseases that increase the risk for liver cancer, a risk which, however, that can be fully countered by early diagnosis and treatment of these diseases.

To reduce the risk from hepatitis B and C, EASL believes that the hepatitis B infant vaccination programmes must be complemented by vaccination programmes for at-risk groups. Measures must be put in place to systematically increase the diagnosis of people with viral hepatitis B and C, and ensure their linkage to treatment and care.

To tackle NAFLD, the organisation recommends public health campaigns, informative labelling of food and all drinks and restrictions on advertising, including those embedded in movies, TV, and social

networks, while the association between alcohol and liver cancer merits increasing taxes on alcohol, improved labelling, restricting advertising and price increases.

Markus Peck-Radosavljevic, Chair of the Public Affairs Committee at **United European Gastroenterology** (UEG), said that lifestyle factors have a significant impact on digestive diseases. Alcohol consumption in particular is a risk factor for over 60 types of disease, with approaching 30% of deaths from gastrointestinal disorders directly attributable to alcohol.

Oesophageal, stomach, pancreatic, liver, small bowel and colon cancer affect both men and women and are the leading cause of cancer-related death in Europe. There is evidence to make a direct correlation between the drinking culture and increased cancer risk, with heavy episodic drinking associated with a higher incidence of digestive cancers.

As even moderate drinking can have a significant impact on the risk of digestive cancers, it is more vital than ever that governments take action and intervene to reduce the harmful use of alcohol. A shift in attitude towards social drinking is required to address the complacency over the negative effects of alcohol.

Investment in public and primary care education campaigns is needed to reduce the general lack of awareness over the impact of even moderate regular drinking. Policies also need to be comprehensive in their approach, increasing the price of alcohol, reducing its availability, improving awareness of the risks, and increasing the minimum age for buying alcohol.

Finally, Marzia Zambon, Executive Director of **EUROPA DONNA**, echoed many in the session by laying bare the high level of alcohol consumption in the European Region and heavy toll it takes in terms of the number of new cancer cases and the annual rate of cancer deaths. The latest data also indicate that, in 2018, 45,500 women developed alcohol-related breast cancer, and there were 12,000 deaths.[27]

Primary prevention and breast health campaigns have long emphasised that lifestyle factors play an important role in the prevention and recurrence of breast cancer, with a focus on physical activity, normal body weight, and nutrition and alcohol intake. Yet there is a worrying lack of awareness of the health impact and proven carcinogenic effect of alcohol.

Drawing on the WHO recommended policies, EUROPA DONNA is calling for action on the labelling of alcohol products to reach consumers directly, as well as a joint media campaign funded via taxes and public funding from EU4Health and Europe's Beating Cancer Plan to raise awareness over the harms of alcohol.

Did you know?

- Harmful alcohol consumption is associated to 3 million deaths every year globally and costs equivalent to 1% of gross domestic product in high and middle income countries
- Europe has the highest levels of alcohol consumption and alcohol-caused deaths in the world, including 92 000 from cancer each year, with a steadily increasing trend in recent years
- Ethanol and acetaldehyde from alcoholic beverages are recognised as carcinogens by the International Agency for Research on Cancer
- Concomitant use of tobacco and alcohol leads to a five-fold increased risk of certain cancers
- For each alcohol-associated cancer, the more alcohol a person consumes, the higher the cancer risk
- There is however no proven safe level of alcohol consumption, as 49% of alcohol-related cancers are not related to heavy drinking

- Alcohol drinking is notably a risk factor for:
  - » Breast cancer, with between three and six alcoholic drinks per weeks being associated with a 15% increased risk, causing 45 500 cases and 12 000 deaths across Europe in 2019;
  - » Hepatocellular carcinoma, a type of liver cancer whose mortality has been increasing by 70% from 1990 to 2019 in the European Union
  - » Digestive diseases, with 30% of deaths from gastrointestinal disorders directly attributable to alcohol
- Beyond cancer causation, alcohol is associated to comorbid psychiatric conditions, postoperative complications and increased risk of various other diseases in cancer patients and survivors

Key policy recommendations

- Alcohol-attributable cancers and deaths can be prevented by reducing alcohol consumption, and using effective public policies to achieve this
- The WHO's goal for a 10% relative reduction in the harmful use of alcohol should be pursued across Europe. This can be achieved through increased political commitment to implement known evidence-based and effective strategies, such as the WHO 'Best Buys' on taxation, marketing and availability of alcohol, and additional successful interventions including on alcohol labelling.
- The implementation of the EU4Health programme and Europe's Beating Cancer Plan is an opportunity to increase public recognition of the association between alcohol consumption and cancer development and death, and in particular of the lack of a safe level of drinking. This could made possible through concerted action at a national and international level, including investing in public and primary care education campaigns, combating the influence of vested interests opposed to alcohol control policies, and involving civil society groups in this effort.
- Increased support is also needed to drive better awareness of, and conduct further research into, the detrimental impacts of alcohol drinking on cancer patients and survivors

Find out more

- WHO Europe:
  - » **WHO 'Best Buys' and other recommended interventions for the prevention and con-trol of noncommunicable diseases**
  - » **WHO Europe SAFER initiative**
  - » **WHO Global Action Plan for Prevention of NCDs**
- American Society for Clinical Oncology: **Statement on Alcohol and Cancer**
- **World Heart Federation**
- **European Society of Breast Cancer Specialists**
- **European Association for the Study of the Liver**
- United European Gastroenterology: **Alcohol and Digestive Cancers**
- **EUROPA DONNA**

Diet, Lifestyle and Preventing Cancer through Improved Obesity Treatment

The next session of the meeting focused on the prevention of cancer through diet, lifestyle and improved obesity treatment. It was opened by Demosthenes Panagiotakos, Professor in Biostatistics, Research Methods and Epidemiology at the University of Athens, and Member of the Scientific Committee of Health, Environment and Emerging Risks (SCHEER), DG SANTE, European Commission, representing the **European Society of Cardiology** (ESC) and the **European Association of Preventive Cardiology** (EAPC).

The two leading causes of disability and death worldwide are, by far, cardiovascular diseases and cancer. Although they are commonly thought of as two separate diseases, they have various similarities and possible interactions, including a number of common risk factors that suggest a shared biology.[28]

Over 70% of cardiovascular disease worldwide is caused by modifiable risk factors, and the ESC endorses four lifestyle behaviours for good cardiac health:

- not smoking;
- physical activity;
- low body mass index; and
- a healthy diet.

However, the causes are not the same around the world, and global strategies need to take a local, tailored approach.

It is estimated that 40% of cancer deaths could be prevented by modifying or avoiding certain risk factors, including tobacco use, obesity, unhealthy diets low in fruit and vegetables, alcohol use, physical inactivity, urban air pollution, sexually transmitted human papillomavirus infection, and indoor smoke from solid fuels. The majority of these have a strong overlap with cardiovascular disease.

A study in the US showed that the top-ranking modifiable risk factors for cancer are smoking, which accounts for 19% of preventable cancer cases, and alcohol, poor diet, physical inactivity and excess body weight, which together account for 18% of cases. In terms of individual cancers, 100% of cervical cancer cases are due to modifiable risk factors, as are 95.1% of skin cancers, 85.8% of lung cancers, 54.6% of colorectal cancers and 38.7% of breast cancers.[29]

The role of diet in cancer risk ranges from known carcinogens in food sources, such as aflatoxins, which are produced by moulds growing in soil, decaying vegetation, hay, and grains, and nitrosamines, to dietary components that have an impact on the development of obesity and chronic inflammatory patterns. There is a causal relationship between red and processed meat and colorectal cancer, between aflatoxins and liver cancer, and between arsenic in drinking water and beta-carotenes and lung cancer risk.

In contrast, there is a causal reduction in the risk of colorectal cancer and diets high in fibre. There is also a probable decreased risk between oropharyngeal, laryngeal, oesophageal and stomach cancer and consumption of non-starchy vegetables, between colorectal cancer and garlic, between oropharyngeal, laryngeal, oesophageal, lung and stomach cancer and fruit consumption, and between colorectal cancer and high calcium diets.

There are several mechanisms linking diet and cancer that seem to be common to the association between diet and cardiovascular disease. These include genetic mutations in the folate metabolism pathway, in conjunction with inadequate folate intake, and meat-dominated dietary patterns increasing the risk of both diseases. On the other hand, conjugated linoleic acids, found primarily in beef and dairy products, have both anti-atherosclerotic and anti-carcinogenic effects, while consumption of polyphenols, found in fruits, vegetables and certain plants, are linked to a reduction in both cardiovascular disease and cancer.

Mediating the link between dietary habits and both cardiovascular disease and cancer risk is chronic inflammation, which is also seen in conditions such as obesity, diabetes mellitus, hypertension, and dyslipidaemia.

Consequently, controlling dietary habits, including moving towards a Mediterranean diet rich in olive oil, fruits vegetables and whole grains, can help reduce the risk of both conditions, while further understanding of the interaction between the two may lead to better prevention, earlier detection and safer treatment strategies.

Jennifer Lyn Baker, Senior Researcher at the Centre for Clinical Research and Prevention, Copenhagen University Hospital System, Denmark representing the **European Association for the Study of Obesity** (EASO), spoke next.

She underlined that more than 50% of European adults are living with overweight or obesity, which is a chronic, relapsing disease characterised by the abnormal functioning or excess of adipose tissue. This tissue is biologically active, and produces growth and sex hormones, and contributes to inflammation.

Obesity is a gateway to cancer, and is associated with colon, breast, corpus uteri, kidney, rectal, oesophageal, pancreatic, gallbladder and ovarian cancer. It requires professional treatment, while prevention needs an integrated health systems approach over the life course. If obesity is prevented and treated, thirteen forms of cancer can therefore be prevented.

Delia Cortes Guiral, a Surgical Oncologist and Board Member at the **European Society of Surgical Oncology** (ESSO), gave her perspective on diet, lifestyle and preventing cancer as a practising physician.

It has been shown that adopting the healthiest possible lifestyle is associated with a 29% lower risk of incident cancer and a 52% reduction in cancer mortality compared with following the least healthy lifestyle. The healthiest lifestyle is also associated with a lower of bladder, breast, colorectal, endometrial, kidney, liver, lung, rectal and gastric cancer.[30]

Being overweight remains an important causes of cancer, and there is evidence of a dose–response relationship between increases in body mass index and a range of cancers, with the strongest evidence for colorectal, gastric cardia, oesophagus, liver, postmenopausal breast, gallbladder, kidney and pancreatic cancer.[31] For each five-unit increase in body mass index, the risk of 13 cancer increases by 5%–50%, and obese men and woman have a between a 6% and 10% higher risk or cancer mortality.

As the proportion of individuals following the healthiest lifestyles is low in many countries, creating environments that better facilitate behaviour modifications should therefore be a public health priority worldwide. Interestingly, there is an emerging body of research particularly in psycho-oncology exploring the barriers to maintenance of exercise among cancer patients.[32] This shows the complexity of facilitating behaviour chance and the potential benefits of specific guidance to health professionals on the ways to introduce some of these topics and to work with patients using evidence-based strategies such as motivational interviewing.

However, more evidence is needed, as no randomised controlled trials have provided evidence on the effects of multiple lifestyle interventions on cancer prevention and prognosis, and further study is needed on site-specific cancers.

Shlomo Vinker, President of the World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians – Europe (**WONCA Europe**), which represents European primary care providers, said that obesity is not only associated with cancer but also heart disease, hypertension, atherosclerosis, diabetes and fatty liver disease. It is nevertheless among the most important preventable causes of cancer, accounting for around 20% of cases. Obesity is a chronic disease that can be treated with bariatric surgery, medications, lifestyle changes and primary prevention.

Primary prevention is better than early detection, as it is the definitive treatment and achieves better outcomes. The role of the family physician in primary prevention is to support weight reduction and lifestyle changes, and the management of metabolic and other complications, as well as early detection. Nothing can replace the trust built up with a family physician, and it helps develop adherence over the long term. However, primary prevention should start at home, in schools and in public spaces.

Finally, Johan De Munter, President of the **European Oncology Nursing Society** (EONS) examined the role

of the cancer nurse in diet, lifestyle and preventing cancer through improved obesity treatment.

The role of the cancer nurse in prevention is under-recognised but is an essential one in the care cancer continuum. Nurses have an opportunity to promote change through health literacy and self-management, and nutritional screening and assessment.

Cancer nurses can offer coaching and inter-professional care to support physical activity and weight loss practices. Through communication, partnership, advocacy and coordination, they can address the psychosocial needs of patients and become personalised counsellors, accompanying them all along the cancer journey from the beginning through survivorship to end of life.

Nurses can help identify and support an exercise and lifestyle plan. This affects the lives of patients and their families but the change does not have to be drastic or frightening. Lifestyle changes are the first step but there are many aspects to how nurses can provide an educational framework for patients. Key to that provision will be educating the future cancer workforce.

Lena Sharp, Past-President of the EONS, added that the organisation would like to invite all interested organisations to collaborate with them in a 12 month cancer prevention campaign aimed at the general public and based on the European Code Against Cancer, focusing on one recommendation from the Code per month.

Did you know?

- Over 70% of cardiovascular disease worldwide is caused by modifiable risk factors; many of which are shared with cancer, including obesity, unhealthy diet and lack of physical activity
- The role of diet in cancer risk is multifaceted, involving the detrimental impacts of consumption of red and processed meat and of food carcinogens such as aflatoxins or arsenic, and the positive impacts of diets rich in fibres
- More than 50% of European adults are living with overweight or obesity, which is a chronic, relapsing disease characterised by the abnormal functioning or excess of adipose tissue, and can be treated with bariatric surgery, medications and lifestyle changes
- Obesity is a gateway to cancer, associated to thirteen different cancer types, including notably colorectal, breast, corpus uteri and kidney cancer
- For each five-unit increase in body mass index, the risk of 13 cancer increases by 5%–50%, and obese men and woman have a between a 6% and 10% higher risk or cancer mortality
- Beyond cancer and cardiovascular diseases, obesity is also associated to diabetes and fatty liver disease
- Adopting the healthiest possible lifestyle is associated with a 29% lower risk of incident cancer and a 52% reduction in cancer mortality
- Family physicians and cancer nurses play key roles, respectively in:
  - » supporting weight reduction and lifestyle changes, as well as in detecting and managing metabolic and other complications from obesity
  - » promoting lifestyle change through health literacy, self-management and nutritional screening and assessment, offering coaching and inter-professional care to support physical activity and weight loss practices, and addressing the psychosocial needs of patients all along the cancer journey

Key policy recommendations

- Citizens should be encouraged to move towards healthier diets, reducing their risk of cancer and cardiovascular diseases, notably through environments that better facilitate beneficial behaviour modifications
- An EU system of front-of-pack food labelling should be established. The system should be mandatory for all EU members states, interpretative and uniform. Exemptions from the labelling requirements should be very carefully limited to prevent undermining of its purpose and uniform reference values should be indicated for all products. This should be seen as a crucial tool to drive positive behaviour changes and help consumers make informed choices about food products. (See European Cancer Organisation's response to European Commission consultation on this matter.[33])
- Further research is needed to:
  - » better understand the links between the role of diet in cancer and other conditions, such as cardiovascular diseases, and thereby allow for better prevention, detection and treatment
  - » generate additional evidence on the impact of lifestyle interventions on cancer prevention and prognosis
- Increased attention needs to be given to the inclusion of the prevention and the treatment of obesity in cancer and other non-communicable diseases primary prevention strategies
- Education of the health and cancer workforce should also be seen as key to cancer and other non-communicable diseases primary prevention, notably to allow them to fully leverage the key roles of family physicians and cancer nurses in building adherence of patients and citizens to preventive interventions

Find out more

- European Society of Cardiology
- European Association of Preventive Cardiology
- European Association for the Study of Obesity
- World Organization of National Colleges, Academies and Academic Associations of General Practitioners/Family Physicians – Europe
- European Oncology Nursing Society
- European Society of Surgical Oncology

Putting UV Radiation Protection in the Spotlight

The final part of the meeting looked at the impact of ultraviolet (UV) light on cancer risk and how individuals can be better protected against its harmful effects.

Joachim Schüz, Head of the Environment and Lifestyle Epidemiology Branch at the **International Agency for Research on Cancer** (IARC), began by showing that between 2% and 3% of total cancers are attributable to UV radiation.

Across the EU, it is estimated that between 75% and 95% of the cases of melanoma of the skin diagnosed each year are preventable. Worryingly, the incidence of melanoma of the skin in people aged 30–85 years is increasing year-on-year. However, public awareness about melanoma remains insufficient in Europe, hampering its prevention and early detection, highlighting the need for education programmes.

Importantly, prevention of skin cancer should not only include malignant melanoma, but also non-melanocytic skin cancers (basal cell carcinoma, squamous cell carcinoma), which are highly frequent and will cause in the future, due to population ageing, a high health and economic burden in Europe as well as an increase in mortality.

The European Code Against Cancer recognises the threat of UV exposure, stating:[2] *Avoid too much sun, especially for children. Use sun protection. Do not use sunbeds.*

Exposure to too much sun causes skin cancer, and this includes 'artificial sun' from sunbeds. The key message is that there is no healthy tan, as tanned skin is a sign of skin damage. The best protection is to minimise direct sunlight when the sun is strongest, to wear appropriate clothing, to seek shade and to avoid the use of sunbeds for cosmetic tanning.

To achieve that, changes are needed in individual sun-seeking behaviour, as is the provision of shady places (and other environmentally protective sources), protective clothing, brimmed hats, and sunscreen with high Sun Protection Factor where UV exposure is unavoidable, such as for outdoor workers, in school yards or in outdoor recreational areas. Access to sunbeds for cosmetic purposes should be limited, with measures ranging from bans to restrictions for some populations, such as minors.

Achieving this will require a combination of individual behaviour and supportive legal and policy frameworks.

Mariano Suppa, Professor of Dermatology at the University of Brussels, representing the **European Academy of Dermatology and Venereology** (EADV), said that as part of Europe's Beating Cancer Plan, the European Commission will explore measures on exposure to ultraviolet radiation, including from sunbeds, which it acknowledges increase the risk of melanoma, the most serious form of skin cancer.[34]

Data showed that individuals who have ever used a sunbed have a 20% increased risk of developing melanoma, a 30% increased risk of basal cell carcinoma and a 70% increased risk of squamous cell carcinoma, with those risks rising to 59%, 40%, and 100%, respectively, in people who first used a sunbed before 35 years of age.[35–40]

Currently, there is a harmonised European standard for appliances, which must deliver ≤300mW/m2 of total effective irradiance, and some countries have restrictions for minors and fair-skinned individuals. There is no safe limit for exposure to UV radiation from sunbeds, however,[41] and the legislative measures taken in Europe are insufficient. Moreover, there is low compliance with the legislation, with malfunctioning or obsolete sunbeds, no warning signs and inappropriate use by customers.

There is huge variation in the prevalence of sunbed use between European countries, with no discernible pattern. For example, the highest use is in Belgium, Latvia, Denmark and Norway, which have lower sun exposure, as well as in Italy, Hungary and Spain, which are at the opposite end of the spectrum.[42]

The highest prevalence of sunbed use among adolescents is in Scandinavia, while the highest prevalence among young adults is in the Baltic countries. The largest gender gap between male and female use of sunbeds is in the Balkans, and there is a stark difference in the prevalence of

sunbed use on the Iberian peninsula, at 20% in Spain but only 2% in Portugal.[42]

Interventions to reduce sunbed use should therefore be multicomponent and tailored to specific populations.[43] Importantly, where legislations have been put in place against the use of sunbeds, such as in Australia, projections indicate, in spite of an increase in "backyard" use, that this will likely lead to major public health benefits long-term.[44]

Brigitte Boonen, President of the **European Society of Skin Cancer Prevention** (EUROSKIN), closed the session and the meeting. She explained that skin cancer is highly prevalent, affecting 27.4 per 100,000 Europeans, is the fastest rising cancer, with rates doubling every ten years, and is the most under-recognised cancer, with low mortality yet high associated healthcare costs, as it is a highly chronic disease. It is nevertheless highly preventable, with interventions potentially able to avert more than 75% of cases.

The aim must therefore be to reduce the impact of cancer by lowering the incidence and mortality via improved primary prevention, earlier detection especially for high risk populations (such as asymptomatic adults aged 50 and above, individuals with personal or family history of melanoma, individuals with high phenotypic or occupational risk like outdoor workers) and better treatment. The strategies to achieve that must include stimulating individual behaviour, providing shade and sunscreen, creating and implementing policies, and using data and research to monitor the disease.

Priority groups with increased risk of exposure include children and adolescents, outdoor workers and sportspeople, sunbed users, tourists and men aged over 50 years. Priority channels for efforts to reduce exposure should include direct communication via companies, schools, communities and the media, alongside indirect efforts via healthcare workers and governments.

Approaches to reduce UV exposure should include informing and educating individuals over its impact, including premature ageing of the skin, as well as changing risk perceptions and social norms over tanning, and support for change and bans, all via incentives and disincentives. A special focus of primary and secondary prevention has to be on high risk groups of outdoor workers.[45] In Germany, as of 2019, employers are legally required to offer regular consultations by occupational physicians to outdoor workers, as UV inflicted skin cancer is already the second most frequently acknowledged occupational disease.

Achieving this will require a European plan and harmonised guidelines and communication, alongside a European Union behaviour monitoring survey, including the patient associations and social partners. In addition, a ban on the use of sunbeds for cosmetic purposes, UV prevention policies in communities, schools and companies, and the evaluation and approval of new technologies for detection and prevention will be needed.

Did you know?

- Between 2% and 3% of total cancers are attributable to UV radiation
- Skin cancer is the fastest rising cancer, with rates doubling every ten years, and is neverthe-less highly preventable, with interventions potentially able to avert more than 75% of cases.
- As recognised in the European Code Against Cancer, exposure to too much sun, including from sunbeds, causes skin cancer: there is no healthy tan, as tanned skin is a sign of skin damage
- Users of sunbeds have a 20-100% increased risk of developing skin cancer
- Beyond sunbed users, other groups with increased risk of harmful UV exposure include chil-dren and adolescents, outdoor workers and sportspeople, tourists and men aged over 50 years

Key policy recommendations

- Skin cancer prevention requires a European harmonised plan combining:
  - » individual changes in sun-seeking and protective behaviours, supported by education and information on risk factors and early recognition, as well as by changes in risk perceptions and social norms;
  - » supportive legal and policy frameworks, in particular:
    - provision of shady places, protective clothing and sunscreen where UV exposure is unavoidable, such as in recreational areas (sports, tourism), in school yards or camps, for outdoor workers; and
    - limitations to the access to sunbeds for cosmetic purposes, with measures ranging from bans to restrictions for some populations, such as minors; and,
  - » use of data and research to monitor the disease.
- Priority channels for efforts to reduce harmful UV exposure should include direct communication via schools, communities, companies and the media, alongside indirect efforts via healthcare workers and governments.
- The implementation of Europe's Beating Cancer Plan should provide the opportunity to resolve currently insufficiencies in legislative measures on sunbeds in Europe, addressing issues in respect to such matters as low compliance with the legislation, malfunctioning or obsolete sunbeds, absence of warning signs and inappropriate use by customers
- Legislation has to be enforced on work protection for outdoor workers, their risk for skin cancer being doubled compared to the average population and WHO threshold levels for daily UV exposure being regularly exceeded by up to six times
- In view of the wide variations in sunbed use across Europe, interventions to reduce it should be multicomponent and tailored to specific populations
- Further attention should also be given to improving skin cancer early detection among high-risk population and treatment in order to decrease skin cancer mortality

Find out more

- The International Agency for Research on Cancer: **Environment and Lifestyle Epidemiology Branch**
- The European Academy of Dermatology and Venereology: **Campaigns on sunbed use and protection of outdoor workers from harmful UV exposure**
- **European Society of Skin Cancer Prevention**

References

1. A cancer plan for Europe. European Commission. https://ec.europa.eu/info/strategy/priorities-2019-2024/promoting-our-european-way-life/european-health-union/cancer-plan-europe_en (accessed 10 June, 2021).
2. European Code Against Cancer. International Agency for Research on Cancer. https://cancer-code-europe.iarc.fr/ (accessed 6 June, 2021)
3. Kulhánová I, Forman D, Vignat J et al. Tobacco-related cancers in Europe: The scale of the epidemic in 2018. *Eur J Cancer* 2020 11; 139: 27–36. doi: 10.1016/j.ejca.2020.07.024
4. Soerjomataram I, Shield K, Marant-Micallef C et al. Cancers related to lifestyle and environmental factors in France in 2015. *Eur J Cancer* 2018 12; 105: 103–113. doi: 10.1016/j.ejca.2018.09.009
5. Feliu A, Filippidis FT, Joossens L et al. Impact of tobacco control policies on smoking prevalence and quit ratios in 27 European Union countries from 2006 to 2014. *Tob Control* 2019 01; 28: 101–109. doi: 10.1136/tobaccocontrol-2017-054119
6. Gredner T, Mons U, Niedermaier T et al. Impact of tobacco control policies implementation on future lung cancer incidence in Europe: An international, population-based modeling study. Lancet Reg Health Eur 2021 May; 4: 100074. doi: 10.1016/j.lanepe.2021.100074
7. Chipty T. Study of the Impact of the Tobacco Plain Packaging Measure on Smoking Prevalence in Australia https://www.health.gov.au/sites/default/files/study-of-the-impact-of-the-tobacco-plain-packaging-measure-on-smoking-prevalence-in-australia.pdf (accessed 9 July, 2021)
8. Post-Implementation Review Tobacco Plain Packaging 2016. Australian Government - Department of Health. https://ris.pmc.gov.au/sites/default/files/posts/2016/02/Tobacco-Plain-Packaging-PIR.pdf (accessed 9 July, 2021)
9. Industry tactics in a changing tobacco control policy environment. Event Report. Brussels: European Public Health Alliance; 2021. https://epha.org/wp-content/uploads/2021/05/tobacco-industry-report.pdf (accessed June 8, 2021)
10. Berdzuli N, Ferreira-Borges C, Gual A et al. Alcohol Control Policy in Europe: Overview and Exemplary Countries. *Int J Environ Res Public Health* 2020 11 04; 17: E8162. doi: 10.3390/ijerph17218162
11. Making the European Region Safer: developments in alcohol control policies, 2010–2019 (2021). WHO Regional Office for Europe. https://www.euro.who.int/en/publications/abstracts/making-the-european-region-safer-developments-in-alcohol-control-policies,-20102019-2021 (accessed June 8, 2021).
12. Global Action Plan for the Prevention and Control of NCDs 2013-2020. World Health Organization. https://www.who.int/publications/i/item/9789241506236 (accessed 8 June, 2021)
13. Seitz HK, Stickel F. Molecular mechanisms of alcohol-mediated carcinogenesis. *Nat Rev Cancer* 2007 Aug; 7: 599–612. doi: 10.1038/nrc2191
14. Sanford NN, Sher DJ, Xu X et al. Alcohol Use Among Patients With Cancer and Survivors in the United States, 2000-2017. *J Natl Compr Canc Netw* 2020 01; 18: 69–79. doi: 10.6004/jnccn.2019.7341
15. Lundberg JC, Passik SD. Alcohol and cancer: a review for psycho-oncologists. *Psychooncology* 1997 Dec; 6: 253–266. doi: 10.1002/(SICI)1099-1611(199712)6:4<253::AID-PON276>3.0.CO;2-3
16. Tønnesen H, Petersen KR, Højgaard L et al. Postoperative morbidity among symptom-free alcohol misusers. *Lancet* 1992 Aug 08; 340: 334–337. doi: 10.1016/0140-6736(92)91405-w
17. Mostofsky E, Chahal HS, Mukamal KJ et al. Alcohol and Immediate Risk of Cardiovascular Events: A Systematic Review and Dose-Response Meta-Analysis. *Circulation* 2016 Mar 08; 133: 979–987. doi: 10.1161/CIRCULATIONAHA.115.019743
18. Hunt E, Malhi GS, Xiong Lai HM et al. Prevalence of comorbid substance use in major depressive disorder in community and clinical settings, 1990-2019: Systematic review and meta-analysis. *J Affect Disord* 2020 Apr 1; 266: 288–304. doi: 10.1016/j.jad.2020.01.141

19. GBD 2016 Alcohol Collaborators. Alcohol use and burden for 195 countries and territories, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet* 2018 09 22; 392: 1015–1035. doi: 10.1016/S0140-6736(18)31310-2

20. Chuang SC, Lee YC, Wu GJ et al. Alcohol consumption and liver cancer risk: a meta-analysis. *Cancer Causes Control* 2015 Sep; 26: 1205–1231. doi: 10.1007/s10552-015-0615-3

21. Bagnardi V, Rota M, Botteri E et al. Alcohol consumption and site-specific cancer risk: a comprehensive dose-response meta-analysis. *Br J Cancer* 2015 Feb 03; 112: 580–593. doi: 10.1038/bjc.2014.579

22. Kunzmann AT, Coleman HG, Huang WY et al. The association of lifetime alcohol use with mortality and cancer risk in older adults: A cohort study. *PLoS Med* 2018 06; 15: e1002585. doi: 10.1371/journal.pmed.1002585

23. Weerasinghe A, Schoueri-Mychasiw N, Vallance K et al. Improving Knowledge that Alcohol Can Cause Cancer is Associated with Consumer Support for Alcohol Policies: Findings from a Real-World Alcohol Labelling Study. *Int J Environ Res Public Health* 2020 01 07; 17: E398. doi: 10.3390/ijerph17020398

24. Hobin E, Shokar S, Vallance K et al. Communicating risks to drinkers: testing alcohol labels with a cancer warning and national drinking guidelines in Canada. *Can J Public Health* 2020 10; 111: 716–725. doi: 10.17269/s41997-020-00320-7

25. Sung H, Ferlay J, Siegel RL et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA Cancer J Clin* 2021 May; 71: 209–249. doi: 10.3322/caac.21660

26. GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990-2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020 Oct 17; 396: 1204–1222. doi: 10.1016/S0140-6736(20)30925-9

27. Alcohol and cancer in the WHO European Region: An appeal for better prevention. WHO Regional Office for Europe. https://www.euro.who.int/en/health-topics/disease-prevention/alcohol-use/publications/2020/alcohol-and-cancer-in-the-who-european-region-an-appeal-for-better-prevention-2020 (accessed 6 June, 2020)

28. Koene RJ, Prizment AE, Blaes A et al. Shared Risk Factors in Cardiovascular Disease and Cancer. *Circulation* 2016 Mar 15; 133: 1104–1114. doi: 10.1161/CIRCULATIONAHA.115.020406

29. Islami F, Goding Sauer A, Miller KD et al. Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States. *CA Cancer J Clin* 2018 01; 68: 31–54. doi: 10.3322/caac.21440

30. Zhang YB, Pan XF, Chen J et al. Combined lifestyle factors, incident cancer, and cancer mortality: a systematic review and meta-analysis of prospective cohort studies. *Br J Cancer* 2020 03; 122: 1085–1093. doi: 10.1038/s41416-020-0741-x

31. Friedenreich CM, Ryder-Burbidge C, McNeil J. Physical activity, obesity and sedentary behavior in cancer etiology: epidemiologic evidence and biologic mechanisms. *Mol Oncol* 2021 Mar; 15: 790–800. doi: 10.1002/1878-0261.12772

32. Ng AH, Ngo-Huang A, Vidal M et al. Exercise Barriers and Adherence to Recommendations in Patients With Cancer. *JCO Oncol Pract* 2021 Mar 19; OP2000625. doi: 10.1200/OP.20.00625

33. Consultation: Food labelling – revision of rules on information provided to consumers. Response from the European Cancer Organisation. European Cancer Organisation. https://www.europeancancer.org/resources/206:european-cancer-organisation-response-to-european-commission-food-labelling-consultation (accessed 9 July, 2021)

34. Communication from the Commission to the European Parliament and the Council. Europe's Beating Cancer Plan. COM/2021/44 final. EUR-Lex. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2021:44:FIN (accessed 9 June, 2021)

35. Gallagher RP, Spinelli JJ, Lee TK. Tanning beds, sunlamps, and risk of cutaneous malignant melanoma. *Cancer Epidemiol Biomarkers Prev* 2005 Mar; 14: 562–566. doi: 10.1158/1055-9965.EPI-04-0564

36. Hirst N, Gordon L, Gies P et al. Estimation of avoidable skin cancers and cost-savings to government associated with regulation of the solarium industry in Australia. *Health Policy* 2009 Mar; 89: 303–311. doi: 10.1016/j.healthpol.2008.07.003

37. Boniol M, Autier P, Boyle P et al. Cutaneous melanoma attributable to sunbed use: systematic review and meta-analysis. *BMJ* 2012 Jul 24; 345: e4757. doi: 10.1136/bmj.e4757

38. Colantonio S, Bracken MB, Beecker J. The association of indoor tanning and melanoma in adults: systematic review and meta-analysis. *J Am Acad Dermatol* 2014 May; 70: 847–57.e1. doi: 10.1016/j.jaad.2013.11.050

39. Burgard B, Schöpe J, Holzschuh I et al. Solarium Use and Risk for Malignant Melanoma: Meta-analysis and Evidence-based Medicine Systematic Review. *Anticancer Res* 2018 02; 38: 1187–1199. doi: 10.21873/anticanres.12339

40. Wehner MR, Shive ML, Chren MM et al. Indoor tanning and non-melanoma skin cancer: systematic review and meta-analysis. *BMJ* 2012 Oct 02; 345: e5909. doi: 10.1136/bmj.e5909

41. SCHEER of the European Commission. Opinion on Biological effects of ultraviolet radiation relevant to health with particular reference to sunbeds for cosmetic purposes. https://ec.europa.eu/health/sites/default/files/scientific_committees/scheer/docs/scheer_o_003.pdf (accessed 9 July, 2021)

42. Suppa M, Gandini S, Njimi H et al. Prevalence and determinants of sunbed use in thirty European countries: data from the Euromelanoma skin cancer prevention campaign. *J Eur Acad Dermatol Venereol* 2019 Mar; 33 Suppl 2: 13–27. doi: 10.1111/jdv.15311

43. Artificial tanning devices: public health interventions to manage sunbeds. World Health Organization. https://www.who.int/publications/i/item/9789241512596 (accessed 9 July, 2021)

44. Gordon LG, Sinclair C, Cleaves N et al. Consequences of banning commercial solaria in 2016 in Australia. *Health Policy* 2020 Jun; 124(6): 665-670. doi: 10.1016/j.healthpol.2020.04.010

45. John SM, Garbe C, French LE et al. Improved protection of outdoor workers from solar ultraviolet radiation: position statement. *J Eur Acad Dermatol Venereol* 2021 Jun; 35(6): 1278-1284. doi: 10.1111/jdv.17011

Participants in the Prevention, Early Detection and Screening Network

Member Organisations Part of this Network

European Association of Urology

European Association of Nuclear Medicine

ECL Association of European Cancer Leagues

EASL The Home of Hepatology

European Hereditary Tumour Group

European Oncology Nursing Society

ERS European Respiratory Society every breath counts

ESHI MT European Society for Hybrid, Molecular and Translational Imaging

EUSOMA European Society of Breast Cancer Specialists

EUSOBI european society of breast imaging

European Society of Pathology

ESRF

European Society of Skin Cancer Prevention EUROSKIN

esso The European Society of Surgical Oncology

ipvs International Papillomavirus Society

IPOS International Psycho-Oncology Society

UNITED EUROPEAN GASTROENTEROLOGY ueg

Patient Organisations Part of this Network

Childhood Cancer International Europe

DIGESTIVE CANCERS EUROPE

EUROPA DONNA The European Breast Cancer Coalition

EUROPA UOMO

European Cancer Patient Coalition

Lung Cancer Europe

LYMPHOMA COALITION EUROPE

MPNE

MPE Myeloma Patients Europe

Community 365 Initiative of the European Cancer Organisation

To view the latest list of the participants to the Prevention, Early Detection and Screening Network visit our website.

If you would like to find out more about the Prevention, Early Detection and Screening Network, please contact us at: info@europeancancer.org

As the not-for-profit federation of member organisations working in cancer at a European level, the European Cancer Organisation convenes oncology professionals and patients to agree policy, advocate for positive change and speak up for the European cancer community.

Publication: July 2021.

european cancer ORGANISATION

Rue d'Egmont 13
B-1000 Brussels, Belgium

+32 2 775 02 00

europeancancer.org

FOLLOW US:
@EuropeanCancer