National Cancer Control Programme

HSE National Cancer Control Programme

Cancer Prevention Plan 2025 – 2030

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Prepared by Lyng A, McGuire F, Neville B. Cancer Prevention, Community Oncology Division, HSE NCCP. June 2025

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Abbreviations

BCTs	Behaviour Change Techniques
CHC	Combined Hormonal Contraception
DNA	Deoxyribonucleic Acid
EU	European Union
EBV	Epstein–Barr virus
HAA	Heterocyclic Aromatic Amines
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HRT	Hormone Replacement Therapy
HSE	Health Service Executive
HPV	Human Papillomavirus
HRA	High Radon Area
IARC	International Agency for Research on Cancer
ICPN	Irish Cancer Prevention Network
ICGP	Irish College of GPs
IIOP	Irish Institute of Pharmacy
IGPNEA	Irish General Practice Nurses Educational Association
MECC	Making Every Contact Count
NCCP	National Cancer Control Programme
NCIS	National Cancer Information System
NCRI	National Cancer Registry Ireland
NMBI	Nursing and Midwifery Board of Ireland
NMSC	Non Melanoma Skin Cancer
NOC	N-nitroso Compound
ONMSD	Office of the Nursing and Midwifery Services Director
PAFs	Population Attributable Fractions
PAHs	Polycyclic Aromatic Hydrocarbon
PCRS	Primary Care Reimbursement Service
PWID	People Who Inject Drugs
RCPI	Royal College of Physicians
RCSI	Royal College of Surgeons in Ireland
SDOH	Social Determinants of Health
SHPIO-CP	Senior Health Promotion and Improvement Officers – Cancer Prevention
UCL	University College London
UN SDGs	United Nations Sustainable Development Goals
UV	Ultraviolet
WHO	World Health Organisation

1. Introduction

At a global level, the World Health Organization (WHO) has estimated that between 30 and 50% of all cancer cases are preventable.[1] In Ireland, on average, over 44,000 cancer cases are diagnosed each year and there are over 10,000 cancer deaths.[2] The estimated lifetime risk of being diagnosed with an invasive cancer (excluding non-melanoma skin cancer (NMSC)) by the age of 75 is approximately 1 in 4 for both men and women.

Not all cancers can be prevented but action can be taken to reduce risk and prevent some cancers. Risk factors include modifiable and non-modifiable risk factors such as tobacco use, alcohol consumption, ultraviolet (UV) radiation exposure, excess body weight, low levels of physical activity, diet, radon exposure, infectious diseases (human papillomavirus (HPV), hepatitis B virus (HBV)), age, family history/genetics, ethnicity, and certain medical conditions.[1]

Cancer incidence is projected to rise over the coming decades. Population ageing will make the largest contribution to this increase. Meeting the rise in demand for health services will pose considerable challenges. Treatment services alone cannot address the burden of cancer care. Prevention must be a key focus as it offers the most cost effective long-term approach for the control of cancer.

The National Cancer Strategy 2017-2026 recognised cancer prevention as a corner stone of cancer control.[3] Recommendation 2 of the strategy tasked the National Cancer Control Programme (NCCP) with establishing a cancer prevention function which would work within the broader Healthy Ireland initiative, and lead in the development and implementation of policies and programmes focused on cancer prevention.

The NCCP established a cancer prevention function in 2018, led by a Consultant in Public Health Medicine. The function works with HSE Health and Wellbeing priority programmes such as Tobacco Free Ireland (TFI), HSE Alcohol Programme, Healthy Eating Active Living (HEAL) and Making Every Contact Count (MECC), and contributes to national policy and legislation. A close working relationship has been established with Healthy Ireland, particularly on collaborative implementation of the National Skin Cancer Prevention Plan.

The NCCP has established, and co-ordinates, the Irish Cancer Prevention Network (ICPN). The ICPN is a partnership with the Irish Cancer Society, the Marie Keating Foundation, Breakthrough Cancer Research and the National Screening Service to support and work together on cancer risk reduction initiatives in Ireland.

The NCCP has provided funding for six Senior Health Promotion and Improvement Officers – Cancer Prevention (SHPIO-CP), one in each of the newly established HSE health regions. The NCCP Cancer Prevention Function established and co-ordinates the SHPIO-CP network, providing support to each of the regional SHPIO-CP and a forum for collaboration with Health & Wellbeing priority programmes.

Other intiatives delivered by the NCCP Cancer Prevention Function include

- cancer prevention research, e.g. the National Survey on Cancer Awareness and Attitudes
- public awareness activities, e.g. annual social media calendar, webinars
- development and provision of cancer risk reduction resources, e.g. free resources on healthpromotion.ie
- education for health and social care professionals, e.g. Reducing Cancer Risk e-learning course on hseland.ie

With the establishment and growth of the function since 2018, it is now an opportune time to review work to date and facilitate robust future planning, including identification of gaps in cancer prevention activity and how best to utilise resources, networks and expertise.

This plan aligns with Ireland's National Cancer Strategy (2016-2027), the fundamental principles of Sláintecare (Prevention and Public Health – Patients accessing care at the most appropriate, cost-effective service level, with a strong emphasis on prevention and public health), the newly established HSE Health Regions and the Healthy Ireland Strategic Action Plan 2021-2025.

The NCCP Cancer Prevention Plan will provide a roadmap for NCCP work in cancer prevention for the coming years.

2. International Cancer Prevention Plans

A review was carried out of international plans with a specific cancer prevention remit, whether addressing cancer prevention in general or focussing on individual cancers. Details of the plans identified are provided in Appendix I.

Most of the plans and strategies identified include cancer prevention as a core theme, recognising that cancer prevention is the most cost-efficient, long-term cancer control strategy.

Plans and strategies with a cancer prevention chapter focus largely on modifiable risk factors for primary prevention of cancer. Tobacco, alcohol, infection, obesity, physical activity and healthy eating are identified as important factors to address, due both to their prevalence and their impact on cancer risk.[4,5,6,7,8,9] Actions within these areas include awareness-raising specific to cancer risk, working with existing public health plans/ strategies, policy, legislation and passive environmental influences.[2,3,5,6,10,11,12,13] Other themes include health inequalities, health literacy and engaging with underserved populations at high risk of cancer (e.g. certain ethnic minorities, LGBTIQA+, lower socioeconomic status groups, people living with a mental illness).[1,4,5,6,8,10,14]

The EU Beating Cancer Plan,[13] published in 2016, identified prevention as a key area, and provides a blueprint for European Union (EU) member states for implementation of cancer prevention initiatives. The EU Beating Cancer Plan considers health literacy, using the European Code for Cancer Prevention, and health determinants, including education, socioeconomic status, gender, age, employment, and inequality. It aims to raise awareness of, and address, key risk factors, including tobacco, alcohol, diet and physical activity (including obesity), environmental pollution, hazardous substances, radiation, and infections. Preventive measures such as vaccination are also highlighted.

The 2021-2030 France Ten-Year Cancer Control Strategy 2021-2025 Roadmap[10] is a plan for overall cancer control. The cancer prevention chapter of this plan targets specific high-risk factors (tobacco, alcohol, obesity (through diet and physical activity), infectious diseases, environmental risks and occupational exposures). It acknowledges the role of the passive environment, targeting young people through schools, and populations at high risk of cancer.

Plans that are specific to cancer prevention tend to focus on individual tumour types e.g. Global strategy to accelerate the elimination of cervical cancer as a public health problem, WHO 2020,[15] Department of Health and NCCP National Skin Cancer Prevention Plan 2023-2026.[16]

Just one plan was identified which was an overall cancer prevention plan: The European Oncology Nursing Society (2021) EONS Cancer Prevention Plan 2021-2023.[17] This plan focuses on the role of nurses in cancer prevention, and how to support nurses to deliver and be involved in primary prevention. Recommended actions to be taken include educating nurses, awareness-raising campaigns and research.

There is consensus in the international plans and strategies identified that cancer prevention should focus on the following themes and actions: high-risk modifiable risk factors, target populations, awareness-raising, working with existing public health programmes, and passive environmental influences. Careful consideration was therefore given to these themes, during the development of this NCCP Cancer Prevention Plan.

3. Health Promotion Frameworks

Health promotion is the process of enabling people to increase control over, and to improve, their health. Health promotion action aims to reduce differences in current health status and ensure equal opportunities and resources to enable all people to achieve their fullest health potential.[18]

The Ottawa Charter for Health Promotion[19] (Figure 1) developed by the WHO presents fundamental strategies and approaches for health promotion which can be applied in cancer prevention. It highlights that health promotion is a comprehensive, multi-faceted approach that applies diverse strategies and methods in an integrated manner. The charter acknowledges that the prerequisites for health are peace, shelter, education, food, income, a stable ecosystem, sustainable resources, social justice and equity. Improvement in health requires a secure foundation in these basic prerequisites.

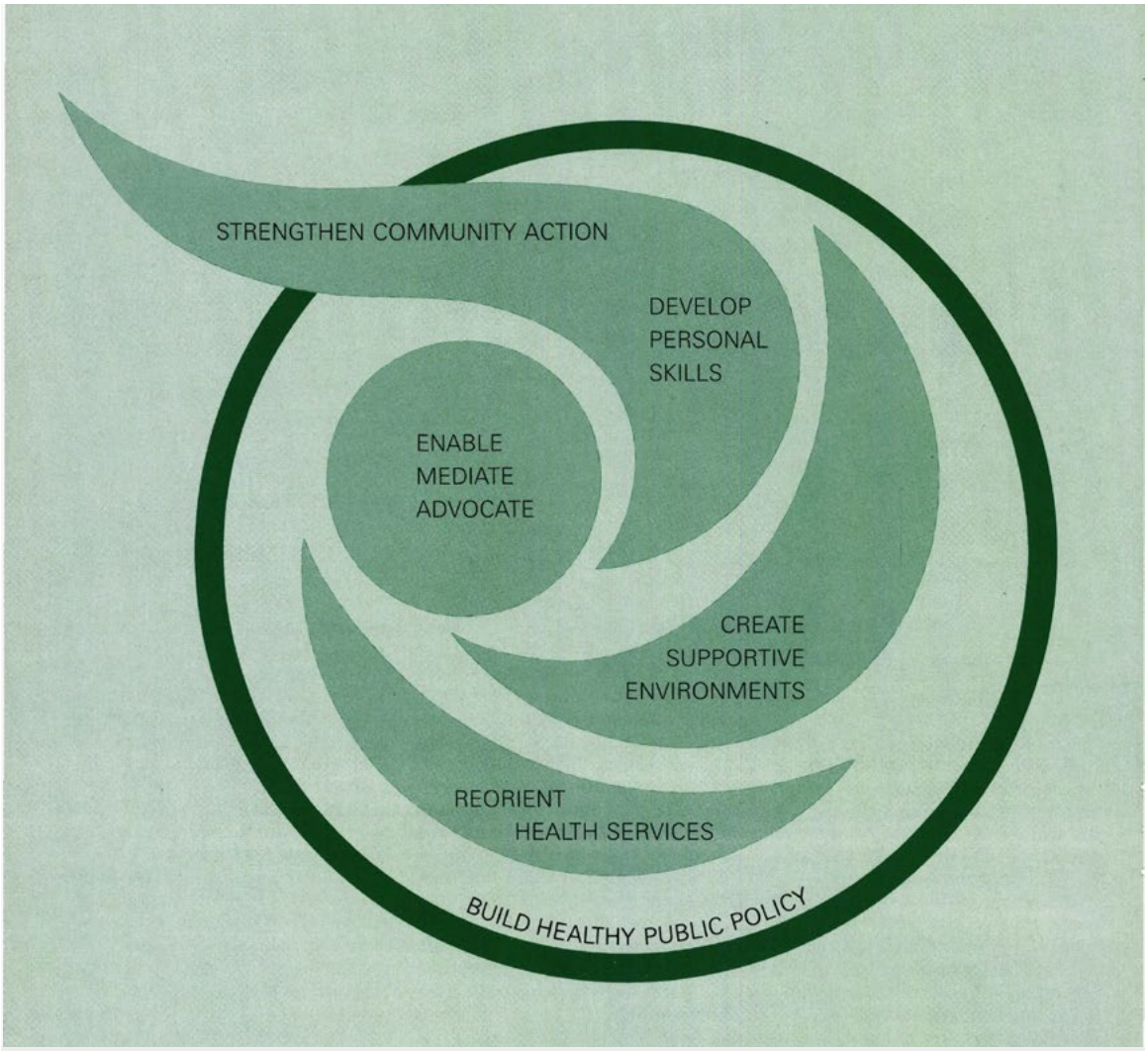

Figure 1: Ottawa Charter for Health Promotion

Despite being developed in 1986, the Charter is applicable to delivering health promotion in the modern day and can be used as a framework for developing cancer prevention actions. The Charter includes three basic health strategies - enable, mediate, and advocate. These should be incorporated in the five key actions areas for health promotion which are:

Build healthy public policy: Health promotion policy combines diverse but complementary approaches including legislation, fiscal measures, taxation and organisational change. The aim must be to make the healthier choice the easier choice, for policy makers as well.

Create supportive environments for health: The inextricable links between people and their environment constitutes the basis for a socioecological approach to health. Work and leisure should be a source of health for people.

Strengthen community action for health: Health promotion works through concrete and effective community action in setting priorities, making decisions, planning strategies and implementing them to achieve better health.

Develop personal skills: Health promotion supports personal and social development through providing information, education for health and enhancing life skills. This must be facilitated in school, home, work and community settings.

Reorient health services: Responsibility for health promotion in health services is shared among individuals, community groups, healthcare professionals, health service institutions and governments. They must work together towards a healthcare system which contributes to the pursuit of health. This requires attention to health research as well as changes in professional education and training.

Social and economic changes have occurred and continue to occur since the Charter was written. In 2016 the WHO produced the Shanghai Declaration on promoting health in the 2030 Agenda for Sustainable Development.[20] The conference positioned health promotion methods and strategies at the heart of actions required to achieve the UN Sustainable Development Goals (UN SDGs).The Shanghai Declaration advocates for additional key strategies:

- improved governance for health
- the development of healthy cities
- improvements in health literacy

Individual initiatives can use the behaviour change techniques (BCTs) to guide implementation. BCTs are the 'active ingredients' of an intervention and vary based on understanding the influences that underline action. BCTs can be used on their own or in combination with each other. Most interventions to change behaviour contain more than one BCT. The University College London (UCL), Centre for Behaviour Change provides open-access tools for researchers, practitioners and policy makers to individual interventions. UCL have produced a BCT taxonomy which lists BCT techniques. This can be used to guide cancer prevention initiatives.

The APEASE criteria can be used as a checklist to evaluate the appropriateness of potential intervention types and policy options.[21] APEASE stands for:

Acceptability: how far an intervention or some part or aspect of it is or is likely to be liked or engaged with.

Practicability: how far an intervention or part of an intervention can or is likely to be able to be delivered as planned and at the scale intended.

Effectiveness: how far an intervention or part of an intervention achieves or is likely to achieve a desired outcome and provides value for money.

Affordability: how far an intervention or part of an intervention can or is likely to be implemented within an available budget.

Spill-over effects: how far an intervention or part of an intervention has, or is likely to have, unintended positive or negative effects.

Equity: how far an intervention or part of an intervention affects or is likely to affect inequalities.

The health promotion strategies and actions outlined in the Ottawa Charter have been used to guide the development of actions in this NCCP Cancer Prevention Plan. The BCT Taxonomy can be utilised as the plan is being implemented to guide interventions.

4. Cancer Risk factors

Cancer prevention is essential to reducing its incidence and impact. Though cancer is not a single disease, many types progress through stages known as the natural history of disease. This progression can be influenced by prevention, treatment, and rehabilitation.

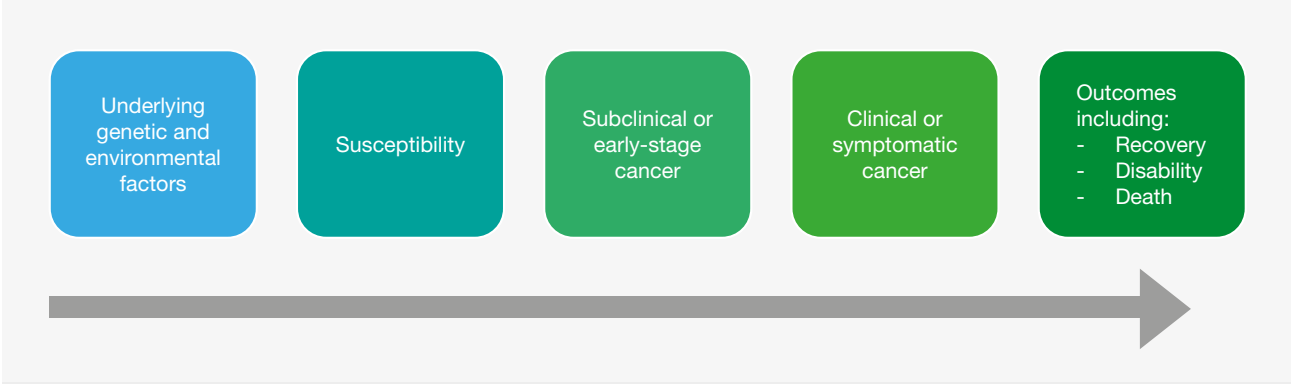

Figure 2: How the natural history of disease applies to cancer[22]

There are a range of factors which influence cancer risk. While not all causes of cancer are modifiable, key risk factors including tobacco, alcohol, physical inactivity, UV exposure, and air pollution can be addressed. Effective cancer prevention relies on public health approaches, underpinned by strong policies and legislation, to support healthy behaviours and reduce cancer risk across the population.

In addition to those in the general population, risk reduction measures are applicable to those:

- after a cancer diagnosis to support living well beyond cancer
- with an increased risk of cancer, such as those with an inherited cancer predisposition or a comorbidity/ chronic disease which increases risk of cancer

Actions within this plan will include these groups.

4.1 Stages of Prevention

Prevention science classifies interventions by stages, aligned with disease progression: primordial, primary, secondary, tertiary, and quaternary prevention. These interventions aim to reduce risk, improve outcomes, and minimise complications.[23] Table 1 summarises the stages of prevention:

Table 1: Stages of prevention

Stage	Aim & Target	Examples
Primordial	Address social and environmental risk factors early, often in childhood	Tobacco legislation, sunbed laws, active transport, workplace safety
Primary	Prevent disease in healthy individuals	HPV/HBV vaccines, physical activity, smoking cessation, treating H. pylori, health promotion
Secondary	Interrupt, delay, or reverse the process of carcinogenesis through the early detection and management of precancerous lesions or early-stage malignancies.	Cervical, bowel, breast, and targeted screening
Tertiary	Manage disease and prevent complications in symptomatic patients	Survivorship care, long-term monitoring
Quaternary	Avoid over-medicalisation	Reducing unnecessary investigations, researching non-invasive alternatives

4.2 Identifying carcinogens

Any substance that can cause cancer is known as a "carcinogen". Carcinogens may be naturally-occurring, such as ultraviolet radiation, radon or certain viruses. They may also be generated or manufactured by humans such as cigarette smoke and alcohol. Most carcinogens work by causing changes (or mutations) in a cell's DNA.[24]

The International Agency for Research on Cancer (IARC) is a division of the World Health Organization (WHO) that uses an evidence-based approach to catalogue factors that are carcinogenic to humans. These factors are documented by the IARC Monographs programme, which identifies factors including chemicals, complex mixtures, occupational exposures, physical agents, biological agents, and lifestyle factors. Once identified, these carcinogens are classified into four main groups, as outlined in Table 2 below.[25]

Table 2: IARC classifications[26]

Classification	Explanation
Group 1	Carcinogenic to humans
Group 2A	Probably carcinogenic to humans
Group 2B	Possibly carcinogenic to humans
Group 3	Not classifiable

The National Cancer Registry Ireland (NCRI) applied a method known as Population Attributable Fractions (PAFs) to estimate the proportion of cancer cases that could be prevented by reducing exposure to certain modifiable risk factors. This approach helps quantify the potential impact of prevention strategies at the population level. In its 2020 report, based on data from 2016, the NCRI estimated that nearly one in three cancer cases in Ireland (29.3%) could have been prevented by addressing known risk factors. This equates to 6,238 out of 21,315 cancer cases (excluding NMSC) in that year. The leading contributors were smoking (13%), overweight and obesity (5%), and infections (3.6%). Looking ahead, the report also projected the burden of cancer attributable to these modifiable risks through to 2035, assuming current exposure patterns remain unchanged. By that year, it is estimated that 4,662 cases will be linked to smoking, 1,788 cases to overweight and obesity, and 851 cases to alcohol consumption. Collectively, these three factors are expected to account for over 66,000 cancer cases in Ireland over a ten-year period ending in 2035.[27]

Understanding and identifying carcinogens is fundamental to developing effective cancer prevention strategies. It informs the delivery of targeted risk mitigation through the implementation of primordial, primary, secondary and tertiary prevention strategies.

4.3 Primordial Prevention

First recognised in 1978, primordial prevention aims to reduce population-level risk by addressing social and environmental conditions.[23] These measures are typically implemented through legislation and national policy. In Ireland, examples include the Public Health (Alcohol) Act 2018 and the Public Health (Tobacco) Acts 2002 and 2004 (as amended).

Table 3: Examples of primordial prevention in Ireland

Policy/ Legislation	Public Health (Alcohol) Act 2018	Public Health (Tobacco) Acts 2002 & 2004
Summary of Key Points	• Minimum unit pricing • Structural separation • Health labelling • Advertising and sponsorship restrictions	• Ban on certain marketing • Restrictions on product claims • Age limit for sale • Smoke-free public spaces
Mechanism	• Alcohol is linked to at least 7 types of cancer, including breast, liver and colorectal cancers • Legislative measures reduce exposure	• Tobacco is a leading cause of cancer, especially lung cancer. • Policy can significantly reduce incidence
Potential Impact	• Reduce alcohol use • Delay initiation • Minimise harm • Control supply and price	• Strengthen tobacco control • Reduce consumption • Limit marketing and access

4.4 Primary Prevention

Primary prevention targets healthy individuals or populations to prevent disease before it occurs.[23] It focuses on reducing risk exposure and enhancing resilience, delaying disease onset and supporting longer, healthier lives. This reduces pressure on health and social care systems.[28]

While behaviour change is a core element, primary prevention goes beyond this. There are many evidence-based interventions proven to reduce cancer incidence. Primary prevention must also consider the unequal distribution of the wider determinants of health and address cancer risk through an equity lens.

Figure 3: Primary prevention of cancer

A risk factor increases the likelihood of developing cancer. Many cancers are linked to modifiable behaviours, such as tobacco use, alcohol consumption, UV exposure, and physical inactivity (see Figure 5). These lifestyle-related risks are distinct from non-modifiable ones like age, genetics, or family history.

Importantly, health behaviours follow a social gradient. For example, Lung cancer is more common among those with lower education, and behaviours like smoking are more prevalent in deprived groups and certain ethnic communities.[31] Tackling these inequities through targeted primary prevention is essential to reduce the cancer burden and advance health equity.

Figure 4: Example of health behaviours that influence cancer risk

4.4.1 Tobacco use

Tobacco is the leading preventable risk factor for cancer worldwide, linked to at least 20 different cancer types, including lung, mouth, throat, oesophagus, stomach, colon, liver, pancreas, and bladder (Figure 5). While cigarettes remain the most common form, other tobacco products are increasingly used. These forms are less well studied, and the evidence base is still developing. Tobacco use continues to pose a major global public health challenge.[30]

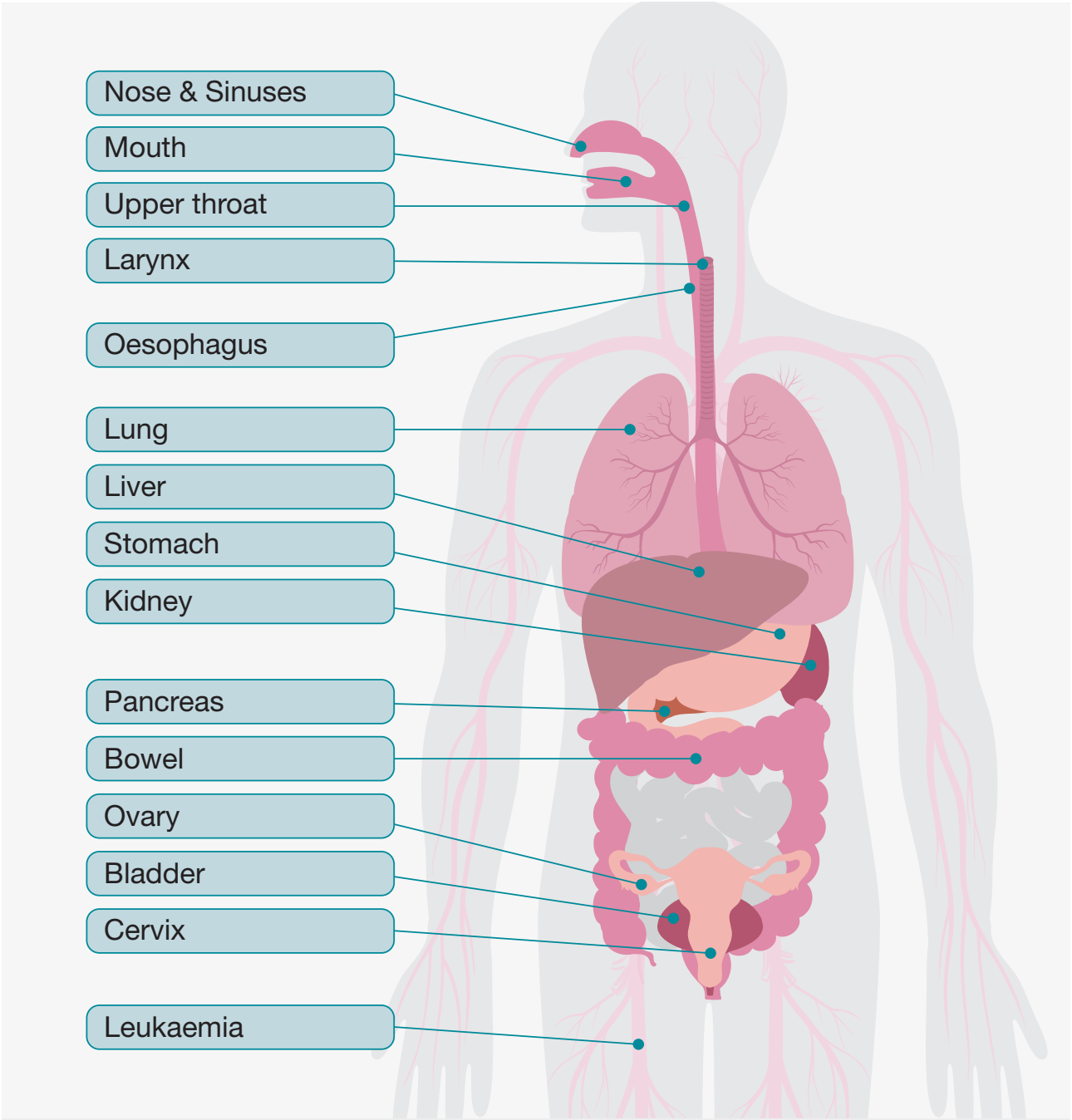

Figure 5: Being smoke free can reduce risk of at least 20 types of cancer

Table 4: Tobacco use – key facts for cancer prevention

Tobacco Use – Key Facts for Cancer Prevention	
Evidence of Carcinogenicity	• Tobacco smoking and smokeless tobacco are IARC Group 1 carcinogens • Second-hand smoke also classified as carcinogenic
Types of cancer	• Tobacco use is linked to at least 20 types of cancer • These include lung, oropharyngeal, oesophageal, bladder, pancreatic, kidney, cervical, and stomach cancers (Figure 5)
Mechanism of Carcinogenesis	• Over 70 cancer-causing chemicals in tobacco smoke • Mechanisms include DNA damage (e.g. from Polycyclic Aromatic Hydrocarbons (PAHs), nitrosamines), inflammation, oxidative stress, changes in gene expression, and activation of cancer-promoting proteins
The Irish Context	• 17% of Irish adults currently smoke (Healthy Ireland 2024)[31] • Smoking caused 13% of all cancers (excluding NMSC); ~2,779 cases in 2016. Prevalence higher in men (20%) and adults aged 25–34[27] • Tobacco and radon have synergistic effect on lung cancer risk • Tobacco and alcohol have a synergistic/multiplicative effect on upper aerodigestive tract cancer risk • Passive smoking increases risk
Evidence for Interventions	• See Figure 6 below • Quitting reduces cancer risk over time • HSE QUIT campaign and smoking cessation services support individuals to stop • Legislation (e.g. Public Health Tobacco Act 2023) and education under the Tobacco Free Ireland Programme have reduced smoking rates, especially in young people and pregnant people[32] • Continued investment in cessation services and public education is essential

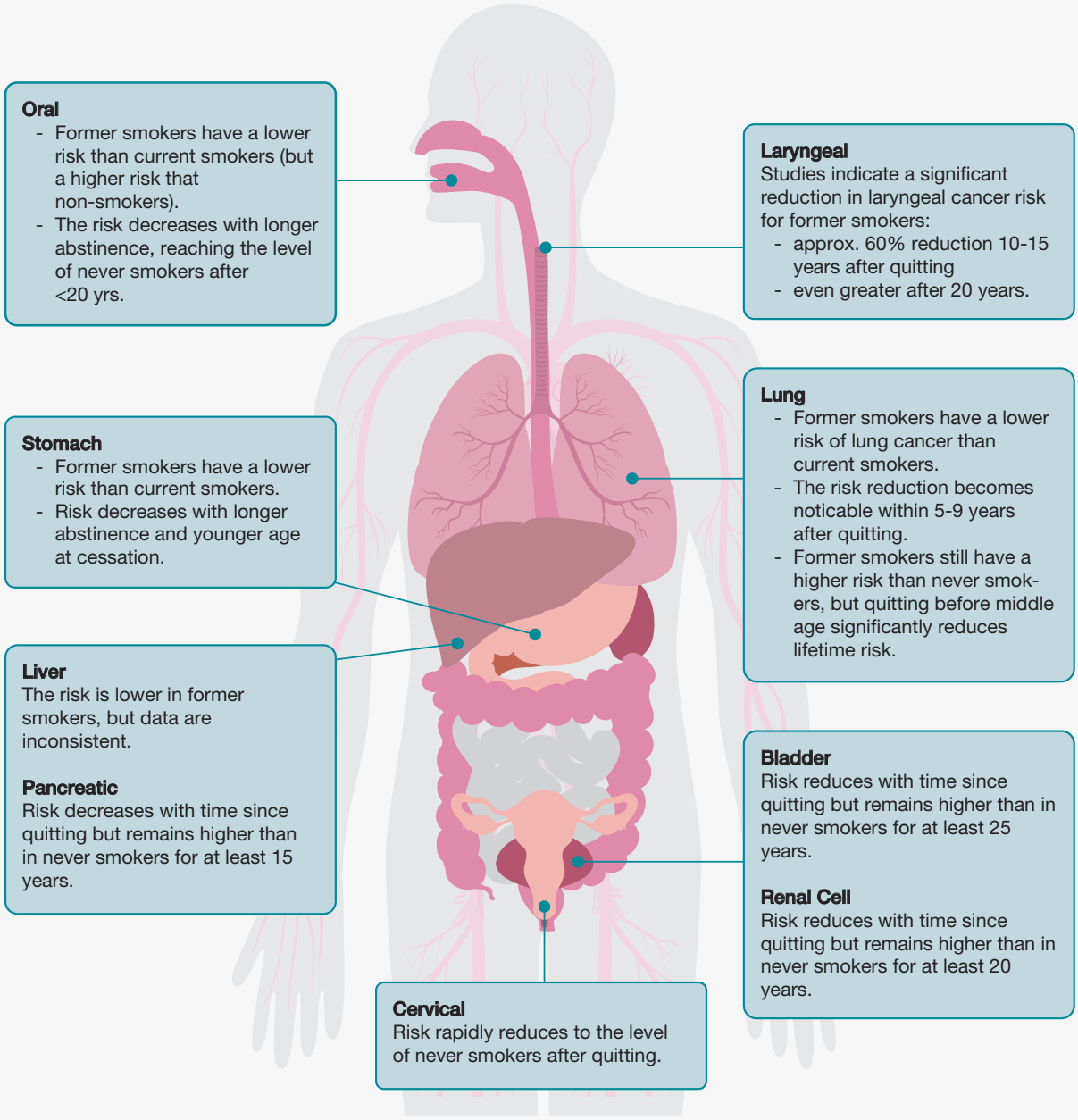

Figure 6: Impact of smoking cessation on cancer

4.4.2 Alcohol consumption

Alcohol consumption is linked to an increased risk of several cancers (Figure 7). There is a "dose-response" association between alcohol and cancer. In other words the risk of developing cancer increases with the amount of alcohol consumed.

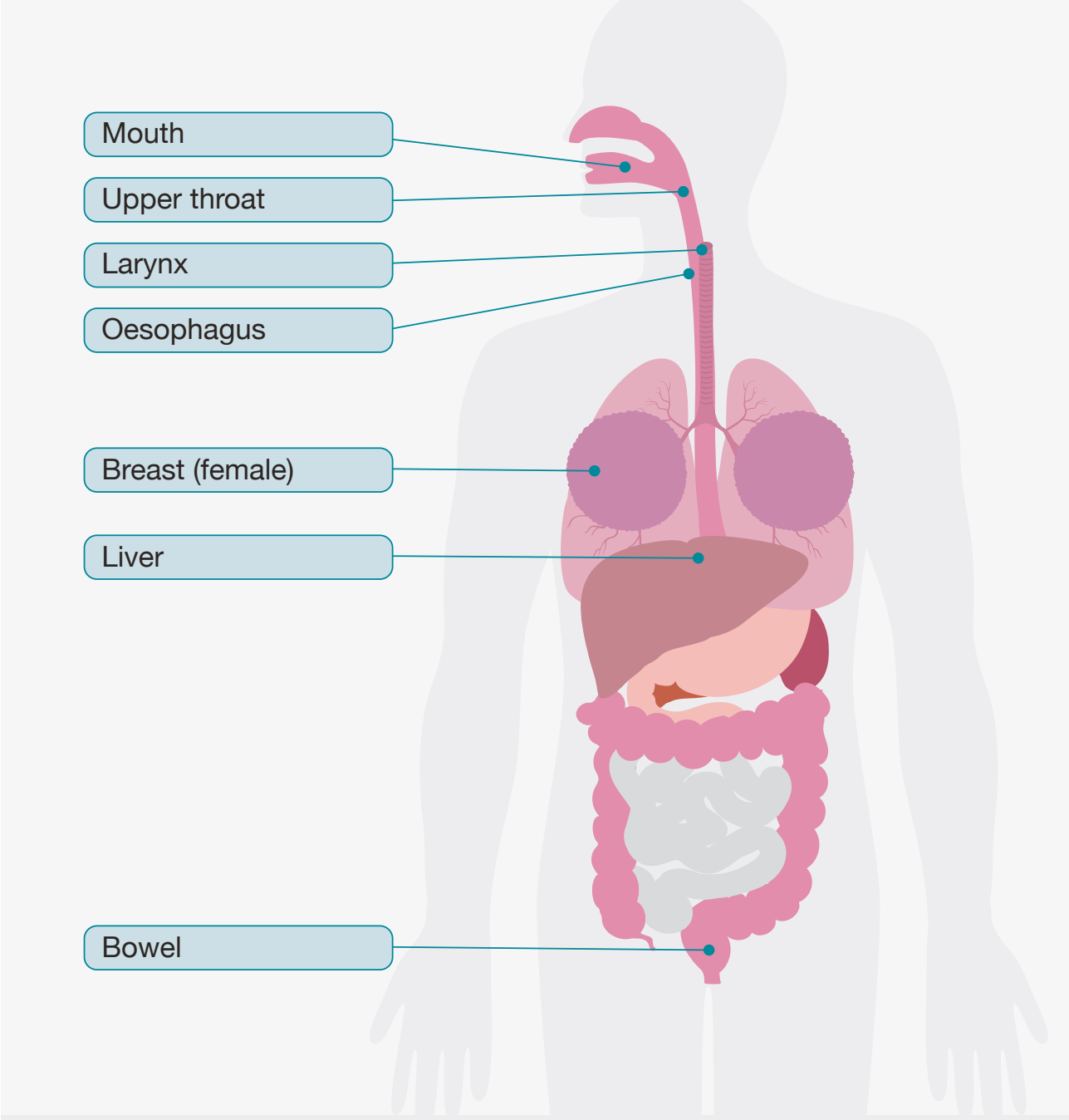

Figure 7: Reducing alcohol intake can reduce risk of at least 7 types of cancer

Table 5: Alcohol – key facts for cancer prevention

Alcohol – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• Alcohol is classified as a Group 1 carcinogen by IARC, the same classification as tobacco and asbestos[33]
Type of Cancer	• Linked to cancers of the breast, liver, colorectum, oral cavity, pharynx, larynx, and oesophagus (Figure 7)
Mechanisms of Carcinogenesis	• Acetaldehyde • Free radicals • Impact on hormones (e.g. oestrogen) • Solvent effect on other carcinogens • Impact on DNA Repair • Folate metabolism
The Irish Context	• Alcohol consumption remains high in Ireland, with 75% of adults reporting use in 2024[34] • Average alcohol consumption in Ireland was 10.2 litres of pure alcohol per person aged 15 and over in 2022, based on sales data. This places Ireland above the EU average of 10.0 litres. Alcohol consumption per capita was 9.9L in 2023.[35] This falls short of the government target of 9.1L set in 2013 to be achieved by 2020 • Despite a long-term decline, alcohol is still a major public health issue • According to European data on alcohol and cancer risk, alcohol consumption is a significant contributor to cancer incidence across the region. In Ireland, this pattern is reflected in the approximately 1,000 alcohol-related cancer diagnoses recorded annually. Of these, alcohol is estimated to cause nearly 400 cases of bowel cancer and at least 260 cases of female breast cancer each year[36]
Evidence for Interventions	• Policy measures like Minimum Unit Pricing and health labelling aim to reduce harm

4.4.3 Body weight and cancer

Maintaining a healthy weight is important for overall health. Excess body weight has been linked to an increased risk of developing and dying from many chronic diseases, including cancer (Figure 8).[38] Obesity and overweight are defined as "the abnormal or excessive fat accumulation that presents a risk to health".[39] Obesity is a progressive, chronic, complex health condition that affects all ages and all genders.

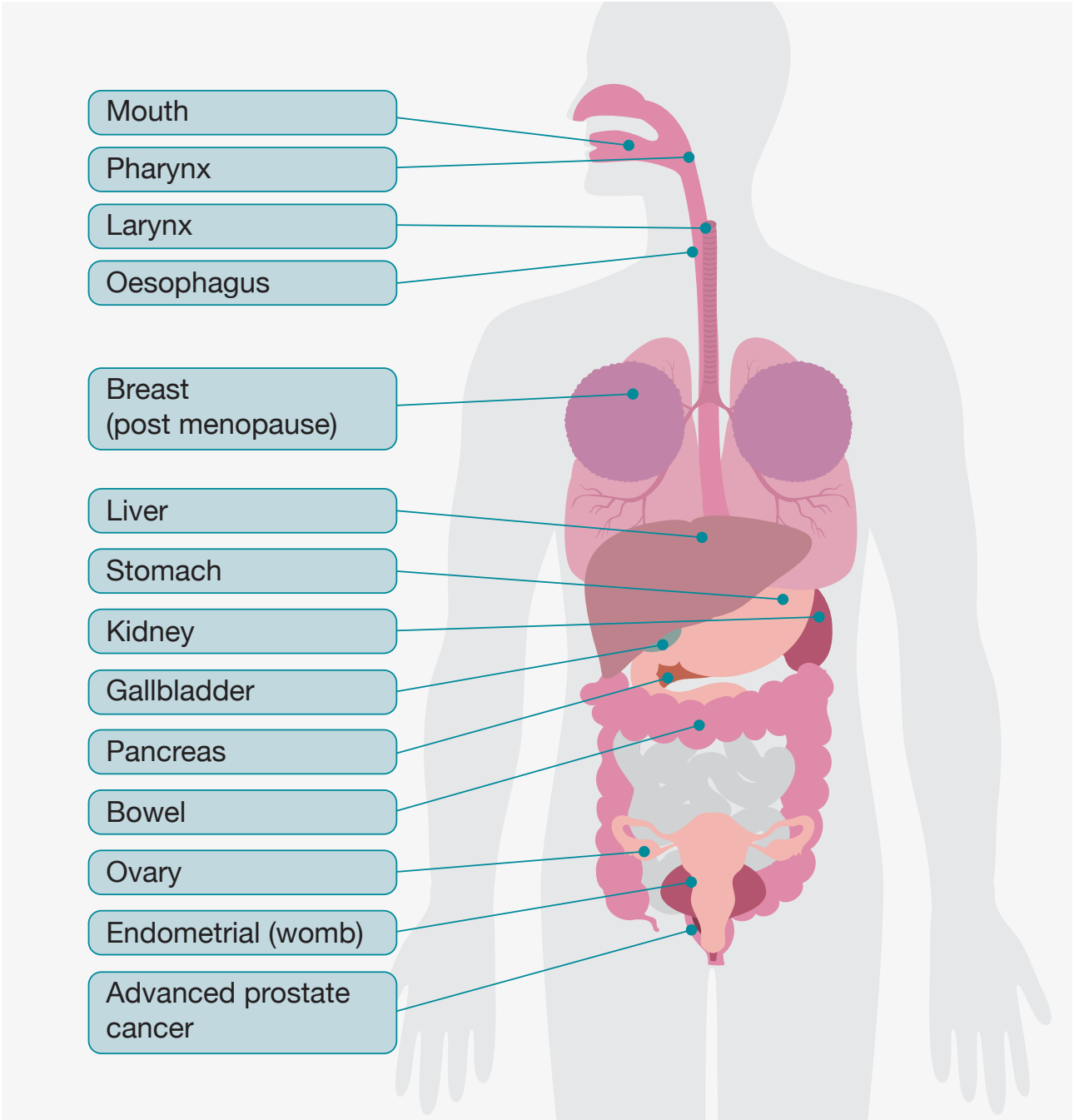

Figure 8: Maintaining a healthy body weight reduces risk of cancers

Table 6: Overweight and bbesity – key facts for cancer prevention

Overweight and Obesity – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• Strong evidence links excess body fat to several cancers[40] • IARC: consistent link between greater adiposity increased risk of 13 types of cancer[41] • Obesity is a major risk factor for cancer
Type of Cancer	• Includes the following (see also Figure 8): Breast, colorectal, endometrial, oesophageal (adenocarcinoma), pancreatic, kidney, liver, gallbladder, gastric cardia
Mechanisms of Carcinogenesis[42]	• Oestrogen: Adipose tissue increases oestrogen after menopause; linked to hormone-sensitive cancers • Insulin & IGF-1: Raised levels promote cell growth & survival • Adipokines: Leptin ↑ (promotes growth), adiponectin ↓ (protective effect lost) • Chronic inflammation: Cytokines (e.g. IL-6, TNF-α) promote tumour progression • Free fatty acids: Fuel tumour metabolism • Angiogenesis: VEGF and PAI-1 support tumour blood supply • Microbiome changes: Altered gut bacteria may increase inflammation and risk • Screening barriers: Obesity may impair early cancer detection (e.g. cervical pre-cancers)[43] • Stigma, including from healthcare professionals, may reduce health-seeking behaviour and worsen outcomes
The Irish Context	• Ireland has among the highest obesity levels in Europe • 63% of men and 50% of women are living with overweight or obesity[44] • One in five children and young people affected[45] • Among older adults: 36% classified as obese, 43% as overweight[46] • Higher prevalence in disadvantaged groups, people with disabilities, and older adults[47] • Obesity rates in disadvantaged schools are 6–7% higher • In 2016, 5% of all cancer cases in Ireland (excluding NMSC) were linked to excess body weight, with the highest proportion seen in kidney, liver, and gallbladder cancers. Colon cancer had the highest number of weight-related cases due to its overall incidence[27]
Evidence for Interventions[48,49]	• Avoiding weight gain reduces risk for 13 cancers (IARC) • Bariatric surgery associated with lower cancer risk (e.g. breast, endometrial) • Low-fat diet with modest weight loss reduced breast cancer recurrence in one trial • Weight stability in adulthood linked to lower risk of colon and postmenopausal breast cancer • Evidence mainly observational; weight loss may coincide with other healthy behaviours

4.4.4 Diet and Nutrition

Dietary factors, including alcohol consumption (discussed separately in Section 4.4.2), are estimated to contribute significantly to cancer rates in Western countries. Diet is closely linked to overweight and obesity and may also include carcinogenic substances such as alcohol and processed meats. The World Cancer Research Fund (WCRF) defines processed meat as: “any meat that has been smoked, cured, or had salt or chemical preservatives (nitrites and nitrates) added”.[51] Processed meats typically include salami, bacon, ham and some sausages such as chorizo. As a result, unhealthy dietary patterns are considered the second most preventable cause of cancer after tobacco use. However, while extensive research has been conducted on the link between diet and cancer, some uncertainties remain and further evidence is needed to strengthen specific dietary recommendations.[50]

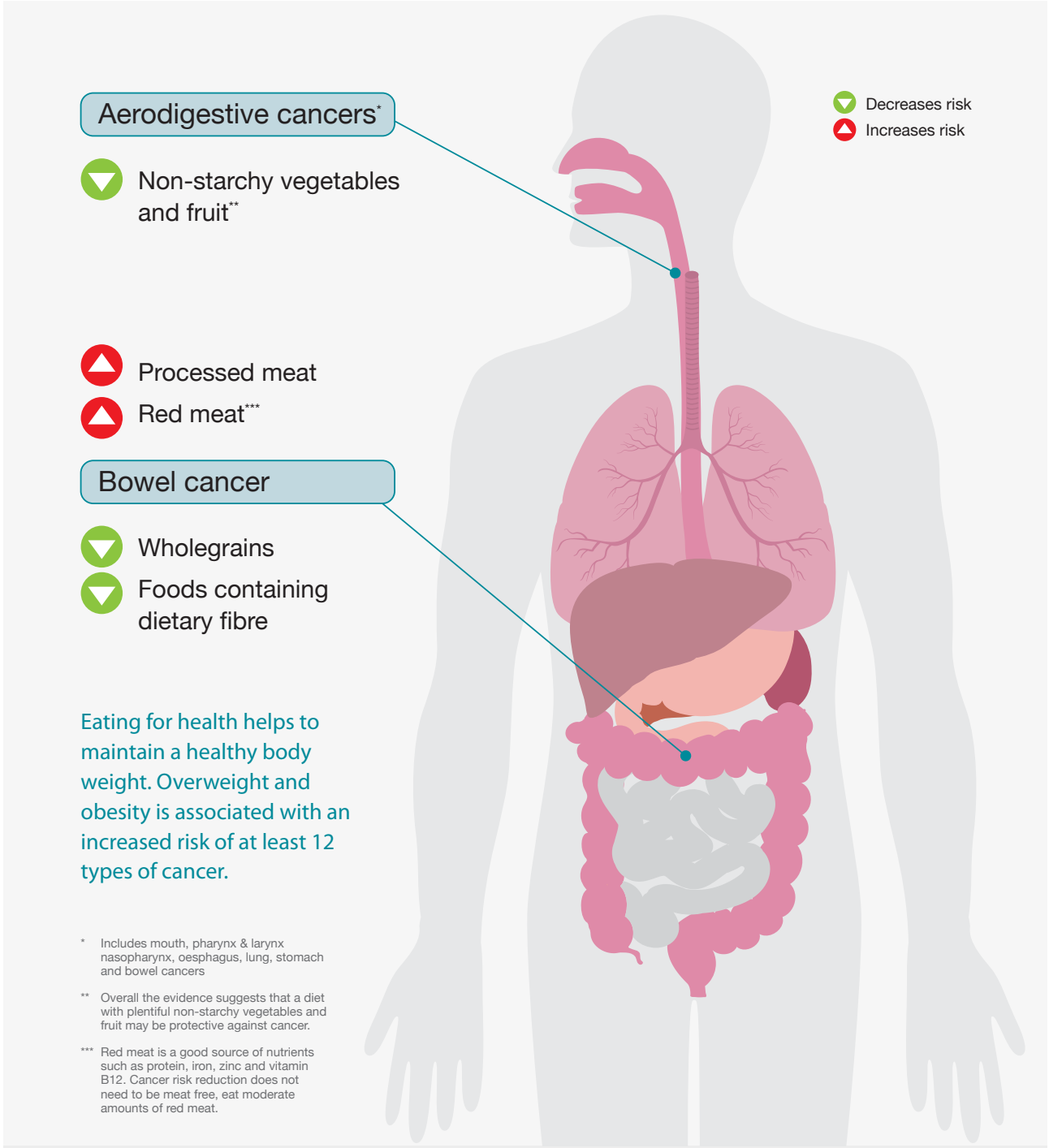

Figure 9: Eating for health can reduce risk of cancer

Table 7: Diet and nutrition – key facts for cancer prevention

Diet and Nutrition – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• Unhealthy diets are the second most preventable cause of cancer after tobacco • 29% of invasive cancers in Ireland are linked to diet and nutrition[27] • Processed meat is a Group 1 carcinogen, linked to colorectal cancer. Red meat is classified as probably carcinogenic (Group 2A)[52] • Wholegrain and high-fibre diets protect against colorectal cancer • Diets high in fat, sugar, and starch promote overweight and obesity • Acrylamide in high-temperature cooked starchy foods is a probable carcinogen[53] • Aflatoxins from mould-contaminated foods increase cancer risk (mainly liver)[54]
Type of Cancer	• Includes the following (Figure 9): colorectal, pancreatic, prostate, liver, oesophageal, stomach, and lung (limited/ suggestive evidence)
Mechanisms of Carcinogenesis[55]	• High-fat, high-sugar foods increase obesity risk, creating a cancer-friendly environment • Sugar-sweetened drinks contribute to obesity • High-GI foods elevate insulin and IGF, promoting cell proliferation and inhibiting apoptosis • Processed and red meats: i. Haem iron forms genotoxic N-nitroso compounds (NOCs) ii. NOCs bind to DNA, causing mutations iii. Heterocyclic aromatic amines (HAAs) and PAHs from high-temperature cooking damage DNA iv. Oxidative stress from processed meats damages DNA v. Secondary bile acids disrupt cell growth, leading to cancer
The Irish Context	• 190 cancers in Ireland in 2016 attributed to processed meat consumption[27] • Socioeconomic inequality affects dietary quality; lower intake of fibre and vegetables in deprived areas • Acrylamide reduction efforts underway across Europe, including Ireland • Aflatoxin more relevant to regions like sub-Saharan Africa, but global food safety is important

Table 7: Diet and nutrition – key facts for cancer prevention

Evidence for Interventions	i. The adoption of a healthy diet is considered an effective way in which an individual can lower their risk of developing cancer[56] ii. Fruit and vegetable intake:[57] • Possible reduction in oesophageal, stomach, and lung cancers • Evidence is insufficient for many other cancer sites iii. Limiting intake of red meat and processed meat:[56] • Likely reduction in the incidence of colorectal cancer (with limiting processed meat) • WCRF recommends no more than 3 portions of red meat per week • No safe level of processed meat has been identified iv. Dairy products, dietary calcium and fibre • Strong evidence to support that consuming these foods decreases the risk of colorectal cancer[58] v. Limiting consumption of hyper palatable ultra-processed foods and sugar sweetened beverages • Strong evidence that these foods increase the risk of overweight and obesity

4.4.5 Physical Activity

Physical activity refers to any movement of the body generated by skeletal muscles that demands energy. It can occur at different intensity levels and includes activities done at work, during household tasks, while commuting, in leisure time, or when engaging in exercise or sports.[59] Sedentary behaviour, conversely, may be defined as any awake activity that involves sitting, reclining, or lying down with minimal energy use.[60]

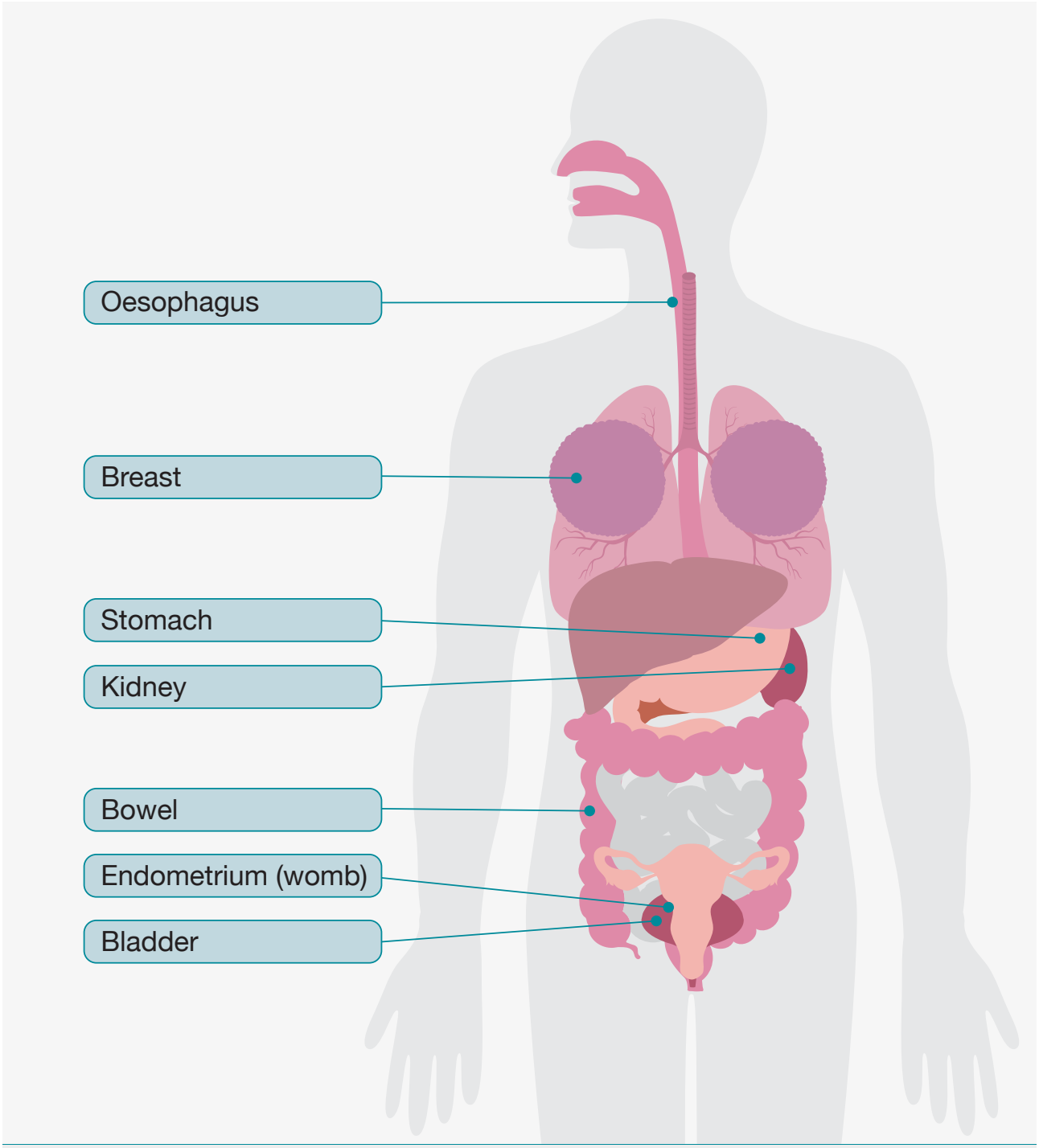

Figure 10 Physical activity can reduce risk of cancer

Table 8: Physical activity – key facts for cancer prevention

Physical Activity – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity (Sedentary Behaviour) and Anti-Carcinogenicity (Physical Activity)	• Strong evidence links physical activity to lower cancer risk • Sedentary behaviour increases overall cancer risk by ~24%, independent of activity levels[1] • Physical activity protects beyond obesity prevention
Type of Cancer	• Includes the following (Figure 10): breast, colon, endometrium, kidney, bladder, oesophagus, stomach, possible links with lung and liver cancers
Mechanisms of Anti-Carcinogenesis (Physical Activity)	Physical activity:[1] • Lowers circulating levels of sex hormones and growth factors • Improves insulin sensitivity, reducing high insulin levels • Decreases chronic inflammation (e.g., TNFα, IL6, CRP) • Enhances genomic stability, DNA repair, and methylation • Shortens gastrointestinal transit time, limiting exposure to carcinogens • Helps prevent overweight and obesity
The Irish Context	• 41% meet activity guidelines (150 mins/week); down from 46% in 2019, 8% report no activity in past week[34] • The awareness of the link between inactivity and some cancers was generally high; however, awareness is significantly lower among those aged 65+ compared to 18–24-year-olds[61] • Women less active than men • Activity declines with age: 40% (18–64) → 22% (65+)[62] • Inactivity estimated to contribute 0.2% of cancer burden (2016 NCRI), likely higher now[27]
Evidence for Interventions	Strong evidence[1,63] that physical activity decreases the risk of the following cancers: • Bladder • Breast • Colon • Endometrium • Kidney • Gastric • Oesophagus Moderate evidence that physical activity decreases the risk of lung cancer. Limited evidence that physical activity decreases the risk of cancers of the: • Ovary • Pancreas • Prostate • Mouth • Pharynx • Larynx

4.4.6 Breastfeeding

Breastfeeding is considered the optimal form of nutrition for infants and young children. WHO advises that infants should be exclusively breastfed for the first six months, and continue breastfeeding along with complementary foods up to the age of two years or longer.[64] The benefits of breastfeeding for the immune systems, health, growth and development of infants are well-documented.[65] Breastfeeding is also important for the health of mothers, conferring a reduction in the risk of breast cancer and ovarian cancer as well as protecting against other chronic diseases such as Type 2 Diabetes.[66]

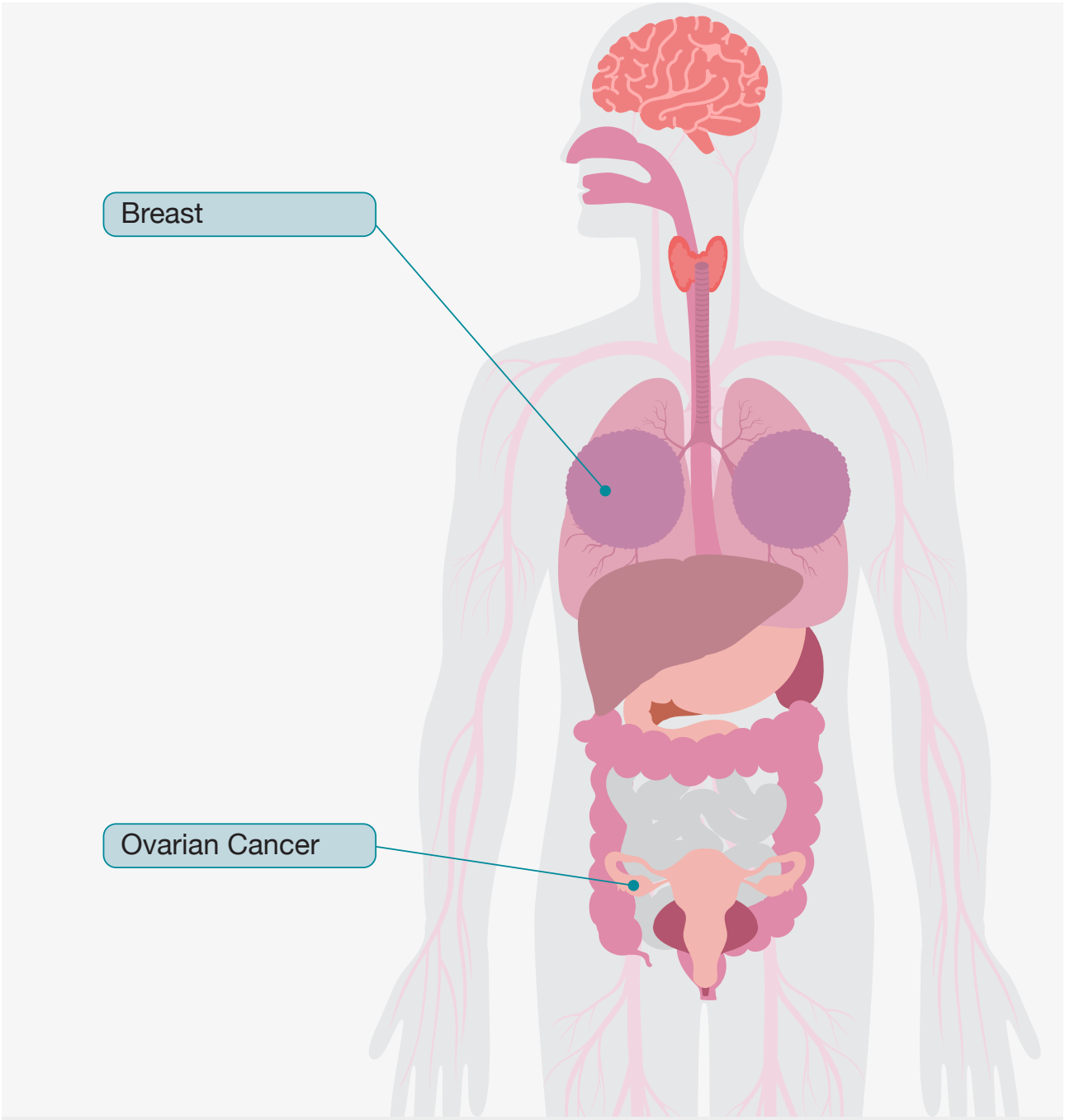

Figure 11: Breastfeeding can reduce the mothers risk of cancer

Table 9: Breastfeeding – key facts for cancer prevention

Breastfeeding – Key Facts for Cancer Prevention	
Evidence for Anti-Carcinogenicity	• IARC - Breastfeeding significantly reduces cancer risk[67] • Breast cancer risk drops by 4.3% for every 12 months of breastfeeding[68,69] • Ovarian cancer risk is reduced by up to 37% depending on duration[70] • Some protection may also extend to endometrial cancer.
Type of Cancer	• Includes the following (Figure 11): breast, ovarian, possibly endometrial
Mechanisms of Anti-Carcinogenesis[71]	• Reduced lifetime exposure to hormones (due to amenorrhoea and reduced fertility) • Exfoliation and apoptosis of breast tissue, eliminating mutated cells • Suppression of ovulation reduces gonadotrophin and oestradiol exposure (ovarian cancer) • Potential reduction in child's lifetime cancer risk via lower obesity rates
The Irish Context	• Ireland has one of the lowest breastfeeding rates in Europe[72] • In 2023, 64% of babies started breastfeeding at birth, 60.3% were breastfed at the first Public Health Nurse (PHN) visit (40.3% exclusively) • At three months, 42% received any breastfeeding, and only 32% were exclusively breastfed[73] • Continued support and promotion are needed
Evidence for Interventions[66]	• Global data suggest current breastfeeding rates prevent ~20,000 breast cancer deaths annually • Increasing breastfeeding duration to 12 months in high-income countries could prevent an additional 20,000 cancer deaths per year • A 30% reduction in ovarian cancer is associated with longer breastfeeding duration

4.4.7 Ultraviolet (UV) Exposure

Given the existence of a dedicated national policy, the National Skin Cancer Prevention Plan 2023-2026, developed by the National Cancer Control Programme in collaboration with Healthy Ireland and the Department of Health, this plan will not examine UV exposure in detail.[16] Instead, a brief overview will be provided, recognising that comprehensive strategies for reducing UV-related risk are already outlined in the National Skin Cancer Prevention Plan.

Table 10: UV exposure – key facts for cancer prevention

UV Exposure – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• IARC - UV radiation from the sun and sunbeds is a Group 1 carcinogen • No safe level of sunbed use exists. A single lifetime use increases melanoma risk by 27%; risk rises to 75% for early-onset cases and for those first exposed before age 35
Type of Cancer	• Includes the following: cutaneous melanoma, non-melanoma skin cancer (NMSC), ocular melanoma
Mechanisms of Carcinogenesis	• UV radiation causes DNA damage directly (mutations) and indirectly (inflammation, reactive oxygen species (ROS)) • Repeated exposure and sunburn weaken immune surveillance, promoting cancer cell growth (photocarcinogenesis)
The Irish Context	• Most Irish people have Fitzpatrick skin types I/II (burn easily)[74] • Skin cancer is the most diagnosed cancer in Ireland (avg. 11,122 cases/year)[75] • Despite good sun protection awareness, 74% of children reported sunburn in the past year[76] • Sunbed use persists in 3% of adults[77] • NCRI estimates approximately 1.9% of all cancers diagnosed in 2016 (excluding NMSC) were attributable to either a history of sunburn or sunbed use[27]
Evidence for Interventions	• UV exposure is preventable • Protective behaviours: shade, clothing, SPF 30+/50+, and avoiding sunbeds reduce risk • Campaigns like Australia's SunSmart and Denmark's sunbed reduction efforts show effectiveness • In Ireland, the Skin Cancer Prevention Plan guides action

4.4.8 Infectious Agents and Cancer

Infectious agents contribute significantly to the global cancer burden, particularly in low- and middle-income countries where healthcare systems and healthcare infrastructure may be insufficient to support effective cancer management. About 13% of cancers worldwide, or 2.2 million cases per year, are caused by chronic infections. While the overall burden of infection-related cancers in Ireland is comparatively lower, targeted prevention remains a key public health priority.[1] IARC have classified several infectious agents as Group 1 carcinogens (Table 11).[78]

Table 11: Infectious agents and the cancers they cause (adapted from Wild et al)

Pathogen	Associated Cancers
Helicobacter pylori	Non-cardia gastric carcinoma, gastric mucosa-assisted lymphoid tissue (MALT) lymphoma
Human papillomavirus (HPV)	Cervical, vulvar, vaginal, penile, anal, oral cavity, oropharyngeal, and tonsillar carcinomas
Hepatitis B virus (HBV)	Hepatocellular carcinoma
Hepatitis C virus (HCV)	Hepatocellular carcinoma, non-Hodgkin lymphoma (NHL)
Epstein–Barr virus (EBV)	Nasopharyngeal carcinoma, Burkitt lymphoma, Hodgkin lymphoma, NK/T-cell lymphoma, immunosuppression-related NHL
Kaposi sarcoma-associated herpesvirus (KSHV/HHV-8)	Kaposi sarcoma, primary effusion lymphoma
Human T-cell lymphotropic virus type 1 (HTLV-1)	Adult T-cell leukaemia/lymphoma
Human Immunodeficiency Virus type 1 (HIV-1)	Kaposi sarcoma, NHL, Hodgkin lymphoma, cervical cancer, anal cancer, conjunctival cancer
Schistosoma haematobium	Bladder cancer
Opisthorchis viverrini, Clonorchis sinensis	Cholangiocarcinoma

According to the NCRI, infectious agents listed are causally linked to 14 distinct types of cancer including nasopharynx, pharynx, liver, stomach, anus, penis, Hodgkin lymphoma, non-Hodgkin lymphoma, vagina, vulva, cervix, Kaposi sarcoma, oral cavity, eye.[27]

Table 12: Infectious agents and cancer – key facts for cancer prevention

Infectious Agents and Cancer – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• IARC have classified several infectious agents as Group 1 carcinogens[78] • In 2018, approximately 13% of new cancer cases globally (2.2 million cases) were linked to four pathogens: Helicobacter pylori, Hepatitis B virus (HBV), Hepatitis C virus (HCV), and Human Papillomavirus (HPV)[79]
Type of Cancer	• Includes the following (Table 11) HPV: cervical, anal, oropharyngeal cancers; H. pylori: non-cardia stomach cancer; EBV: lymphomas, nasopharyngeal cancer; HBV/HCV: liver cancer; HIV: Kaposi sarcoma, non-Hodgkin lymphoma
Mechanisms of Carcinogenesis[80]	• Direct genetic alteration (e.g. HPV inactivating tumour suppressors p53 and Rb) • Chronic inflammation (e.g. H. pylori, HBV, HCV) • Immune suppression (e.g. HIV) • Microbial products and toxins • Tissue damage and repair cycles
The Irish Context	• In 2016, an estimated 3.6% of all cancers in Ireland (766 cases, excluding NMSC) were attributable to infectious agents • HPV alone accounted for 397 cancers (257 cervical) • H. pylori was linked to 208 stomach cancers • Due to gaps in national data, some estimates used Northern Ireland or international data[27]
Evidence for Interventions[80]	• Vaccines: HPV, HBV • Curative treatment: HCV, H. pylori, macroparasites • Long-term antivirals: HIV, HBV • Public health measures (e.g. reducing aflatoxin exposure, snail control for schistosomiasis) • Behavioural interventions (e.g. reducing raw fish consumption in Thailand) • Screening based on pathogen biomarkers (e.g. HPV testing) • Surveillance (e.g. endoscopic follow-up in H. pylori-positive patients) • Antiviral/immunotherapy for virus-associated cancers • Antiparasitic drugs for schistosomiasis/fluke-related cancers • Educational interventions promote safer sex practices • Regular STI testing, vaccination, and condom use are effective

4.4.9 Immunisations and Cancer

It is estimated that, globally, 1 million cases of cancer per year could be prevented by immunisation against Hepatitis B and HPV.[81]

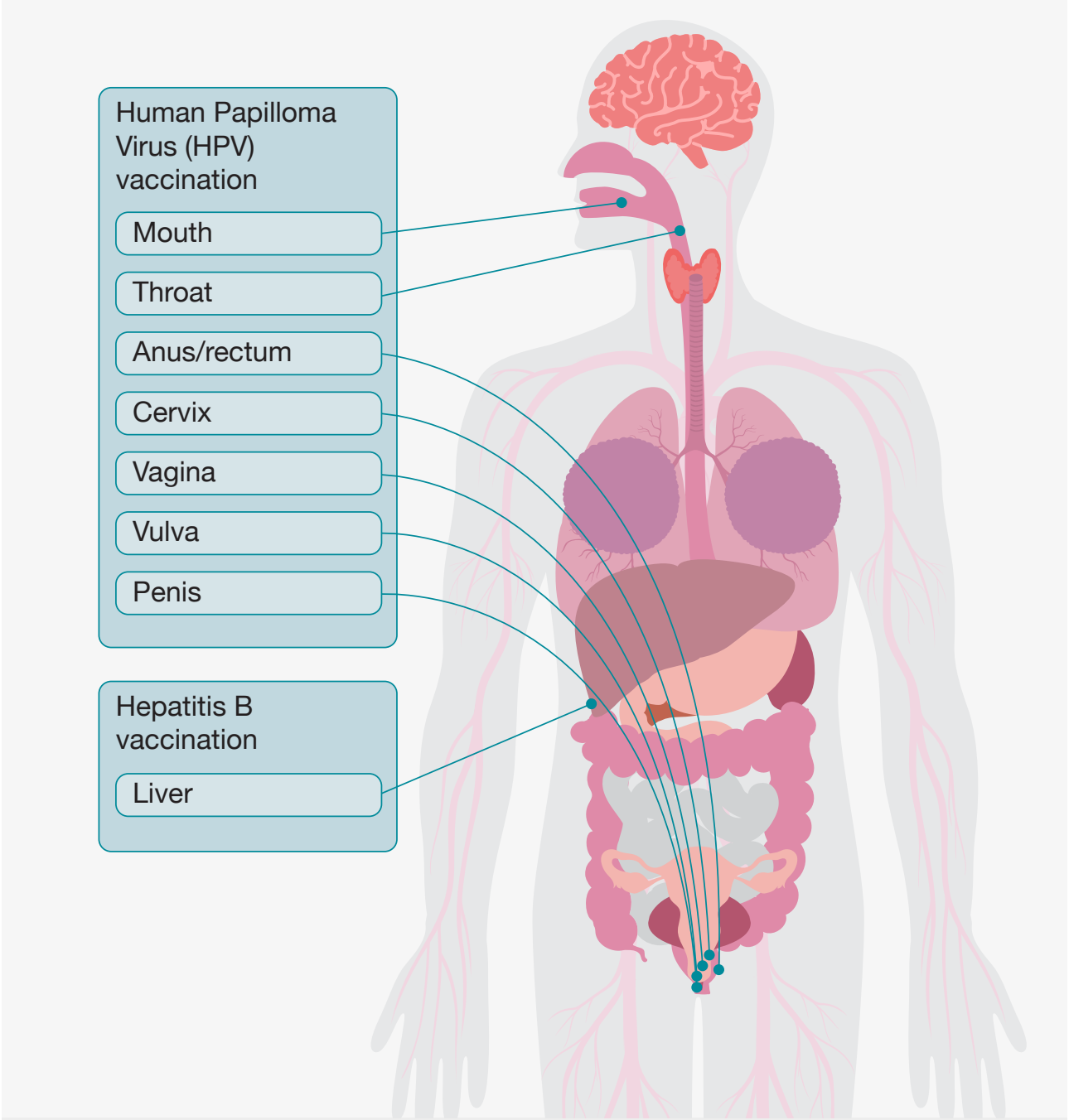

Figure 12: Vaccination can reduce risk of cancer

Table 13: Immunisation – key facts for cancer prevention

Vaccine type	Hepatitis B Vaccine[82]	HPV Vaccine[83]
Evidence for Carcinogenicity	• HBV is a DNA virus and a major global cause of liver disease • Chronic HBV infection can lead to hepatocellular carcinoma. HBV accounts for around 60–80% of liver cancer cases worldwide	• Over 100 HPV types exist, with ~14 considered high-risk • Persistent infection with high-risk types causes cancer
Type of Cancer	• Includes the following (Figure 12): Hepatocellular carcinoma (primary liver cancer)	• Includes the following (Figure 12): cervical, anal, oropharyngeal, penile, vulvar, vaginal cancers
Mechanisms of Anti-Carcinogenesis (of vaccine)	• Prevents chronic HBV infection, thereby reducing long-term risk of cirrhosis and liver cancer • Countries with high-coverage programmes have seen major reductions in liver cancer incidence, especially in children and young adults	• Induces immune response to high-risk HPV types (e.g. 16, 18) • Prevents persistent infection, thereby reducing HPV-associated cancers • Quadrivalent and 9-valent vaccines target most oncogenic types
The Irish Context	• In Ireland, HBV prevalence is low (<0.5%), but higher-risk pockets exist (e.g. Persons Who Inject Drugs (PWID), people with multiple sexual partners, prisoners, and migrants from endemic countries) • Targeted vaccination began in 1988, with universal childhood vaccination added in 2008 • Most notifications are chronic infections in migrants; acute cases mainly involve Irish-born individuals and sexual transmission • Notified cases peaked 1997–2008 with rising immigration, now ~500/year, mostly in 20–44-year-olds	• Between 2010–2014, ~538 HPV-related cancers/year in Ireland (73% in women) • Most common: cervical cancer (292), oropharyngeal SCC (133), vulva (38), penis (32), anus/rectum (31) • Oropharyngeal cancers rising rapidly; 77.5% in men; ~50% attributable to HPV • 360 cases/year attributable to vaccine-covered HPV types • National school-based vaccination began in 2010 (girls), expanded to boys in 2019 • Uptake dropped in 2016 due to safety concerns but recovered with public advocacy, communication strategies, and visible leadership • Recent uptake >80% in girls; early positive signs in boys • Men having sex with men, aged under 45 and who are attending sexual health clinics, can also avail of HPV vaccination

Table 13: Immunisation – key facts for cancer prevention

Vaccine type	Hepatitis B Vaccine[82]	HPV Vaccine[83]
Evidence for Interventions	• HBV vaccination is part of the 6-in-1 schedule at 2, 4, 6 and 13 months • Also recommended for at-risk groups (e.g. healthcare workers) • Can be used for pre- and post-exposure prophylaxis • HBV immunisation is one of the clearest examples of a cancer-preventing vaccine	• Strong evidence of reduced HPV infection, precancerous lesions, and cervical cancer in vaccinated cohorts • Sweden: 88% reduction in cervical cancer among women vaccinated before 17[84] • Similar trends in Scotland and Australia • HPV vaccination prevents cancer, and early vaccination maximises benefit • Strong alignment with WHO cervical cancer elimination goals[15]

4.4.10 Ionising Radiation

Ionising radiation has enough energy to remove electrons from atoms, potentially damaging biological tissue. It includes:

- Electromagnetic radiation (X-rays, gamma rays): indirectly ionising, causing damage via secondary particles
- Particulate radiation (e.g. electrons, protons, α-particles): mostly directly ionising, except for neutrons, which are indirect

Exposure can be external or internal (via inhalation, ingestion, skin contact, or injection). The health impact depends on the type, dose, and distribution of radiation. While X-rays, gamma rays, and neutrons penetrate deeply, α- and β-particles cause more localised damage due to their short range.[85]

Table 14: Ionising radiation – key facts for cancer prevention

Ionising Radiation – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• All forms of ionising radiation are classified by IARC as Group 1 carcinogens[1]
Type of Cancer	• Associated with at least 13 types of cancer, including lung, skin, and thyroid cancers
Mechanisms of Carcinogenesis	• Gene mutations • Chromosomal damage • Altered gene expression • Latency of years to decades • Risk influenced by age at exposure, sex, and dose • Synergistic effect between radon and tobacco smoke[86]
The Irish Context	• ~1.1% of cancers attributable to radiation in Ireland [27] • Natural sources: Radon, thoron, cosmic rays, terrestrial radiation, food/water • Artificial sources: medical diagnostics (Computerised Tomography scans (CTs), X-rays), therapeutic uses, industrial and fallout exposure remain minor • Radon is the largest contributor to population exposure. High Radon Areas (HRAs) identified; average indoor radon concentration among the highest globally (98 Bq/m^3)[87] • The EPA estimates that radon causes about 350 cases of lung cancer in Ireland every year.[88] However the NCRI report a more conservative estimate that 71 cases of lung cancer were attributable to radon in 2016, due to exclusion of smoking attributable cancers from the calculations[27] • Awareness of radon risks many be poor among high-risk groups. A survey of patients at a Rapid Access Lung Clinic revealed that most were unaware of the radon-lung cancer link, despite 20% having elevated radon levels at home[89]
Evidence for Interventions	• Reducing radon exposure has the potential to reduce 280 cancer cases a year[90] • Building regulations since 1998 require radon barriers in HRAs • National Radon Control Strategy (2014) promotes awareness, testing, remediation, and contractor training. Uptake remains low[91] • Sustained public health strategies needed: enhanced testing, remediation support, and better targeting of at-risk populations • Monitoring via testing rates, remediation uptake, and lung cancer trends is essential

4.4.11 Outdoor Air Pollution (Fine Particulate Air Pollution - $PM_{2.5}$)

IARC has conducted comprehensive evaluations on the carcinogenicity of outdoor air pollution, with a particular focus on fine particulate matter ($PM_{2.5}$). Fine particulate matter ($PM_{2.5}$) consists of airborne particles with a diameter of 2.5 micrometres or less, and is emitted when organic matter is burned.

Table 15: Fine particulate air pollution $PM_{2.5}$ – key facts for cancer prevention

Fine Particulate Air Pollution $PM_{2.5}$– Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• PM and outdoor air pollution are classified by IARC as Group 1 carcinogens[92] • $PM_{2.5}$ has strong epidemiological links to increased lung cancer incidence (RR = 1.09). Each 10 µg/m³ increase in exposure to fine particulate matter (PM2.5) is associated with a 9% increase in the risk of lung cancer[27]
Type of Cancer	• Primarily lung cancer
Mechanisms of Carcinogenesis	• DNA and chromosomal damage • Oxidative stress • Altered gene expression • Mutagenicity • Epigenetic changes • $PM_{2.5}$ can penetrate deep into lungs and bloodstream due to small size
The Irish Context	• $PM_{2.5}$ from solid fuel burning and NO_2 from traffic remain localised problems[93] • 7.5% of lung cancer cases and 0.2% of all cancers (excl. NMSC) in 2016 were attributable to $PM_{2.5}$ (≈36 cases)[27] • WHO air quality guidelines are frequently exceeded in parts of Ireland despite generally good air quality[94]
Evidence for Interventions	• Aligning $PM_{2.5}$ levels with WHO guidelines (≤5 µg/m³) could prevent nearly 1,000 premature deaths annually (including deaths from cancer)[94] • Action on solid fuel use and traffic emissions is essential for health and climate co-benefits • Modelling conducted in the West Midlands region of England suggests WHO alignment could prevent approximately 170 cases of lung cancer annually in the region[95] • Accelerated action is needed to reduce fossil fuel combustion

4.4.12 Occupational Exposures and Cancer Risk

Occupational exposure to carcinogens remains a significant health risk, particularly in environments with multiple hazardous agents. Such exposures account for an estimated 3.5–5% of cancer deaths in high-income countries, with likely underreporting in low- and middle-income regions. Occupational cancer research has been pivotal in identifying carcinogens affecting both workers and the general population. Lung cancer is the most prevalent, while mesothelioma is strongly linked to workplace asbestos exposure. The number of IARC Group 1 carcinogens has risen from 28 (of 89) in 2003 to 47 (of 119) in 2017. Additionally, 12 occupations or industrial processes are now classified as carcinogenic based on sufficient human evidence.[96]

Table 16 below outlines key occupational carcinogens and associated cancer types.

Table 16: Occupational exposures and cancer risk[97]

Type of Cancer	Occupational Exposures	Additional Notes
Lung Cancer	Asbestos, secondhand smoke, arsenic, nickel, chloromethyl ether, silica dust, radon, formaldehyde, diesel fumes, chemicals in painting and printing	Mesothelioma is a rare lung cancer strongly linked to asbestos. Smoking dramatically increases asbestos risk. Protective equipment essential for asbestos removal.
Bladder Cancer	Dyes containing benzidine and naphthylamine, rubber, paint, leather industry chemicals	Elevated risk noted in barbers and hairdressers due to dye exposure; carcinogenic dyes largely phased out since 1970s.
Skin Cancer	Ultraviolet (UV) radiation from sun exposure, asphalt, diphenyls, reflective surfaces (water, sand, concrete, snow)	High risk among outdoor workers: construction, farming, landscaping, roofing, fishing boats. UV exposure exacerbated by reflective surfaces.
Lymphomas	Herbicides, pesticides	Increased risk in agricultural workers exposed to these chemicals.
Prostate Cancer	Pesticides	Observed higher incidence among farmers and agricultural workers.
Pancreatic Cancer	Pesticides, dyes, gasoline	Associations identified with chemical exposures in these industries.
Liver Cancer	Exposure to hepatitis B and C viruses via body fluids (healthcare workers), occupational toxins	Healthcare workers at risk through exposure to infectious agents and chemicals.

Table 17: Occupational exposures – key facts for cancer prevention

Occupational Exposures – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• Occupational exposures account for an estimated 3.5–5% of all cancer deaths in high-income countries. IARC classified 47 agents and 12 occupational processes as Group 1 carcinogens by 2017[96]
Type of Cancer	• Includes (see Table 16) primarily lung cancer and mesothelioma. But also: bladder, skin, lymphomas, prostate, pancreatic, and liver cancers
Mechanisms of Carcinogenesis	• Depends on agent, dose, exposure duration, host susceptibility, and co-exposures (e.g., smoking) • Some carcinogens act directly or through metabolic by-products; others require co-exposure • Mutagens may cause permanent DNA damage
The Irish Context	• About 5% of cancers in Ireland are attributed to occupational exposures • 47% of surveyed EU workers (incl. Ireland) are exposed to at least one carcinogenic factor • Blue-collar workers face higher risk, especially in construction and manufacturing
Evidence for Interventions	• Occupational cancers are largely preventable. Key strategies include substitution or removal of carcinogens, protective equipment, improved work practices, exposure monitoring, regulation, education, and health surveillance[98] • Smoking cessation and pre-market chemical testing are also important preventive measures • Ireland has implemented comprehensive legislation to reduce occupational exposure to carcinogens through the Safety, Health and Welfare at Work (Carcinogens, Mutagens and Reprotoxic Substances) Regulations 2024 (S.I. No. 122/2024)[99]

4.4.13 Hormonal Therapies and Cancer Risk

Hormonal therapies such as combined hormonal contraception (CHC) and hormone replacement therapy (HRT) have been associated with both increased and decreased risks for certain cancers. The overall impact on cancer risk depends on factors such as duration of use, age at initiation, and individual patient characteristics.

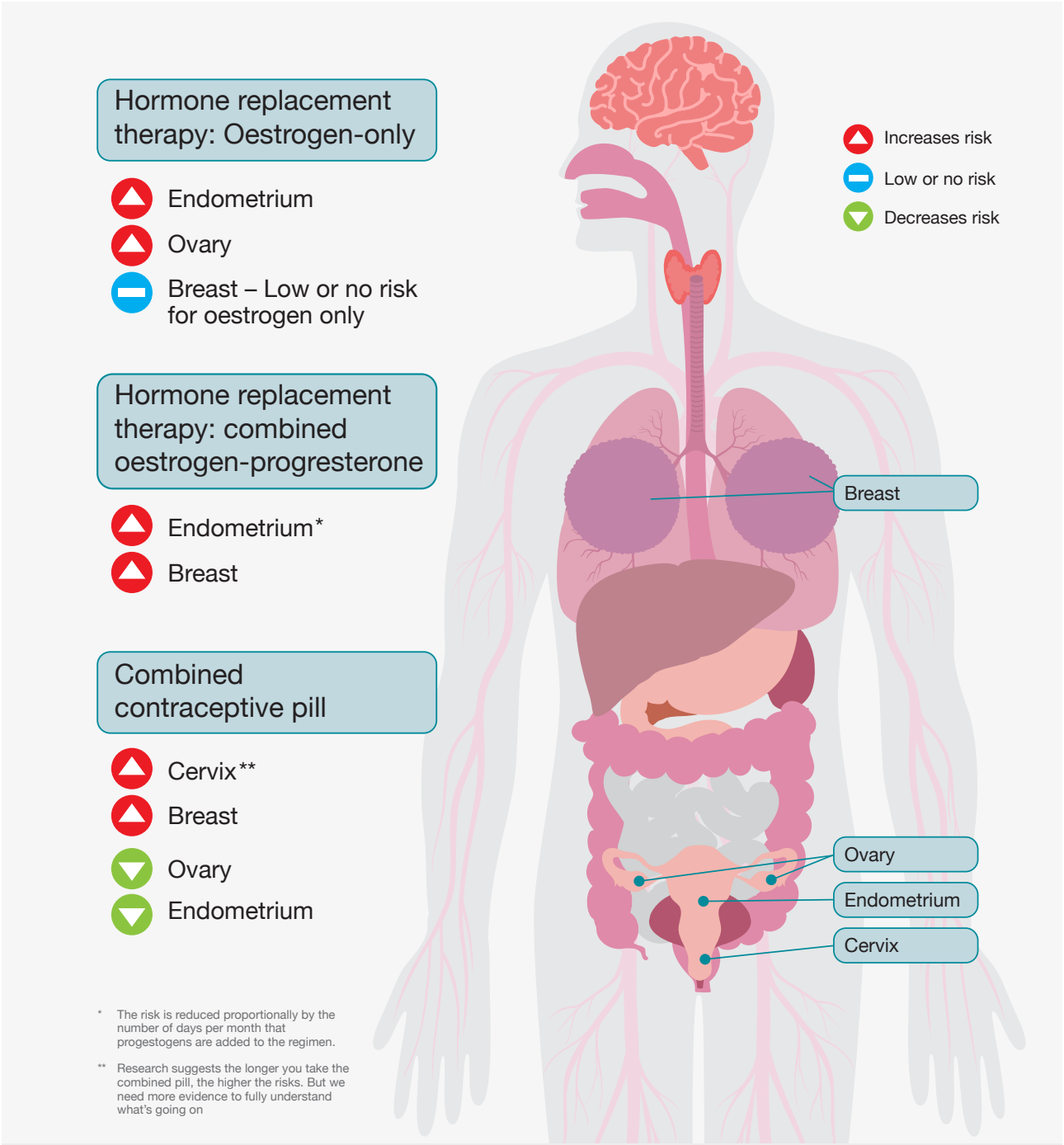

Figure 13: Hormonal therapy and cancer risk

4.4.13.a Hormonal Contraception and Cancer Risk

Hormonal contraception, including CHC, has been used by women worldwide for almost 60 years, with significant changes in dosage and preparation over time.[100] The relationship between hormonal contraceptives and cancer is a complicated one, with hormonal contraceptives potentially increasing the risk of some cancers while reducing the risk of others.

Table 18: Hormonal contraception – key facts for cancer prevention

Hormonal Contraception – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity or Anti-Carcinogenicity	• IARC classifies combined oestrogen-progestogen contraceptives as carcinogenic to humans (Group 1), and progestogen-only contraceptives as possibly carcinogenic (Group 2B) • CHC use associated with increased risk of breast, cervical, and possibly liver cancer, but reduced risk of ovarian, endometrial, and possibly colorectal cancers[1]
Cancer Type	• Includes (see Figure 13): breast (↑), cervix (↑), liver (↑), ovary (↓), endometrium (↓), colorectal (↓) • BRCA1/2 mutation carriers may also benefit from reduced ovarian cancer risk
Mechanisms of Carcinogenesis or Anti-Carcinogenesis	• CHCs elevate risk of hormone-sensitive cancers (e.g., breast) due to synthetic oestrogen/progestogen • They may increase cervical cancer risk by enhancing epithelial vulnerability to HPV • Protective effects include suppressed endometrial proliferation, inhibited ovulation (reducing hormone exposure), and lower bile acids (reducing colorectal cancer risk)
The Irish Context	• 2020 Irish survey: 28% of women aged 17–45 used the contraceptive pill[101] • NCRI data: current users had a 90% increased cervical cancer risk and 21% increased breast cancer risk. In 2016, 0.5% of female cancers in Ireland (~114 cases) were linked to oral contraceptives[27] • Contraceptive use may contribute to but is not the primary cause of cervical cancer (HPV is)
Evidence for Interventions	Risk–benefit assessment should be individualised. Benefits include pregnancy prevention and reduced risk of some cancers. Evidence supports prescribing CHCs cautiously, considering duration, type, and personal/family cancer risk.

4.4.13.b Hormone Replacement Therapy and Cancer Risk

Hormone replacement therapy (HRT) is a hormonal treatment used to relieve symptoms of menopause and perimenopause. Menopausal symptoms can have a significant impact on quality of life. HRT includes oestrogen-only (mainly for women post-hysterectomy) and combined oestrogen–progestogen preparations.

Table 19: Hormone replacement therapy – key facts for cancer prevention

Hormone Replacement Therapy – Key Facts for Cancer Prevention	
Evidence for Carcinogenicity	• IARC classifies oestrogen-only HRT as Group 1 carcinogen for endometrial, ovarian, and breast cancers • Combined HRT also Group 1 carcinogen, linked to breast and endometrial cancers; endometrial risk reduced by progestogen[1]
Cancer Type[102]	• Oestrogen-only HRT includes (see Figure 13): Endometrium (↑), Ovary (↑), Breast (↑), Colorectal (possibly ↓) • Combined HRT includes (see Figure 13): Breast (↑), Endometrium (↑, reduced by progestogen), Ovary (mixed evidence), Colorectal (possibly ↓)
Mechanisms of Carcinogenesis	• Carcinogenesis likely via hormone-receptor mediated pathways and genotoxic effects including DNA adducts and reactive oxygen species causing DNA damage
The Irish Context	• NCRI (2016): Data from the PCRS in 2006 showed that 6.3% of women were prescribed HRT • Current users had 43% higher ovarian and 66% higher breast cancer risk vs never-users • HRT attributed to 0.5% of female cancers (~114 cases)[27]
Evidence for Interventions	Benefits and risks vary by HRT type/duration. Benefits include improved quality of life, reduced risk of some cancers, osteoporosis, cardiovascular protection. Risk–benefit discussion advised with healthcare professionals.[103]

4.5 Secondary Prevention

Secondary prevention detects cancer or pre-cancer in people who appear healthy, enabling earlier treatment. It targets subclinical disease to reduce mortality and improve survival by finding cancer or pre-cancer at a more treatable stage. It's especially important for high-risk groups including those with genetic predispositions, underlying health conditions, or environmental exposures.

It includes:

- Screening for precancerous lesions
- Surveillance
- Early detection
- Targeted interventions – prevention of disease progression to malignancy[104]

Like many developed countries, Ireland has well-established, organised, population-based screening programmes in place for the early detection of breast, cervical, and colorectal cancers.[105] This Cancer Prevention Plan focusses on targeted secondary prevention for those at increased risk due to genetic, infectious, environmental, or medical factors. These groups benefit from enhanced screening and surveillance beyond population-based programmes.

National guidance, such as the NCCP Hereditary Cancer Model of Care,[106] Immunisation Guidelines for Ireland,[107] and the National Cancer Strategy (2017-2026),[3] highlight the importance of identifying and managing high-risk groups. Interventions include personalised cancer risk assessment +/- genetic counselling and testing, enhanced surveillance, prophylactic surgery, and chemoprevention. Equitable access to these measures is key to improving outcomes and advancing health equity.

Table 20: Secondary prevention of cancer (not exhaustive)

High-Risk Group	Associated Cancer Risks	Recommended Interventions	Relevant Irish Guidance / Programmes
People with hereditary cancer syndromes (e.g. BRCA1/2, Lynch)	BRCA: breast, ovarian, prostate, pancreatic; Lynch: colorectal, endometrial, ovarian, other	Intervention depend on the type of hereditary cancer syndrome but include:[106,108,109,110] Chemoprevention, e.g. aspirin (Lynch), risk-reducing surgery, e.g. bilateral salpingo-oophorectomy (BRCA) and surveillance imaging/ endoscopy	NCCP Hereditary Cancer Model of Care (2023); National Cancer Strategy 2017–2026[3]
Cancer survivors	Second primary cancers (site-specific)	Survivorship care plans, lifestyle counselling, site-specific screening[111]	NCCP Survivorship Framework;[112] National Cancer Strategy
People living with HIV	AIDS-defining (e.g. Kaposi's sarcoma, non-Hodgkin lymphoma, invasive cervical cancer); non-AIDS-defining cancers (e.g. lung, liver, and anal cancers).[113]	Cancer screening, Early treatment with antiretroviral therapy,[114] multidisciplinary care, HPV[83] and HepB[82] immunisation	HSE HIV Services; NIAC Guidelines
Individuals with chronic infections (e.g. Hep B/C, H. pylori)	Hep B/C: hepatocellular; H. pylori: gastric carcinoma, MALT lymphoma	Screening/treatment, ultrasound, eradication follow-up	H. pylori clinical guidance;[115] Hep B/C recommendations[116]
Immunocompromised (e.g. transplant recipients, Primary immunodeficiency (PID), recipients of immunosuppressive therapy)	Solid organ transplant recipients: Increased risk across 32+ cancer types; including hepatocellular carcinoma, anogenital and cervical cancers, GI tract cancers, head & neck cancers, nasopharyngeal carcinoma, NMSC, lymphoma. PID ~1.4x higher cancer risk than general population. Lymphomas account for ~60% of cancer cases in PID.	Risk-adjusted screening, immunisation, specialist surveillance	NSS Guidance[117] Immunisation Guidelines for Ireland (NIAC)[118]

Table 20: Secondary prevention of cancer (not exhaustive)

High-Risk Group	Associated Cancer Risks	Recommended Interventions	Relevant Irish Guidance / Programmes
Occupational exposures	Mesothelioma, lung, bladder	Occupational surveillance, health assessments, monitoring	HSA Guidance[119] HSA chemical agents code of practice[120]
Transgender individuals	Breast, prostate, cervical (depending on anatomy/hormones)	Organ-based screening, breast/prostate/cervical health education	ICGP Guidance[121]
Childhood radiation exposure	Secondary breast, thyroid cancer	Lifelong surveillance, imaging	NCCP Survivorship after childhood cancer;[122] Framework for the Care and Support of Adolescents and Young Adults (AYA);[123] National Clinical Programme for Paediatrics and Neonatology[124]

4.6 Tertiary Prevention

As of the end of 2022, approximately 220,728 individuals living in Ireland were cancer survivors (either currently undergoing treatment or post-treatment), representing around 4.3% of the population, or roughly one in every 23 people[2]. The number of cancer survivors is expected to double over the next 25 years. This projected increase is largely due to improvements in early detection, more effective treatments, and ongoing innovations in cancer care.[125]

Tertiary prevention begins post-diagnosis and focuses on quality of life and survivorship. It includes therapies to control progression, prevent metastasis, and reduce recurrence or second cancers.[126] It also addresses physical, psychological, and social impacts of cancer. Key supports include rehabilitation, mental health services, nutrition, and management of side effects.

The NCCP Survivorship Programme promotes coordinated, comprehensive care and recognises survivorship as a distinct phase of the cancer journey. It aims to optimise the health and wellbeing of cancer survivors by enhancing survivorship services, supporting the management of treatment consequences, and providing accessible information and guidance. The programme recognises survivorship as a distinct phase of the cancer journey and works to ensure that individuals living with and beyond cancer receive coordinated, comprehensive care that supports their recovery and long-term quality of life.[127]

Emerging evidence highlights that modifiable lifestyle factors remain important even after a cancer diagnosis. For cancer survivors, engaging in primary prevention behaviours, such as maintaining a healthy weight, adopting a healthy diet, being physically active, and limiting alcohol consumption, can reduce the risk of developing a second primary cancer and improve overall health outcomes.[128,129]

4.7 Addressing Inequity in Cancer Prevention

The NCCP is committed to taking an equitable approach to cancer prevention. Social, economic and other inequalities affect cancer risk. People in deprived areas and underserved communities, such as Travellers, migrants, people with a disability and those with lower health literacy, can face greater exposure to risk factors and more barriers to preventive services.

To address this, the NCCP works with Healthy Ireland and HSE Health and Wellbeing to implement targeted prevention initiatives. Regional SHPIO-CPs collaborate with local services and communities to support healthier behaviours and early help-seeking, with actions tailored to local needs and based on community engagement. Improving equitable access to early detection is a key focus. The NCCP supports the National Screening Service's Community Champions programme, which trains individuals from underrepresented groups as trusted local advocates. This model helps raise awareness, build trust, and overcome cultural and practical barriers to screening participation.

Partnerships with non-governmental organisations, such as via the Irish Cancer Prevention Network, help extend health promotion efforts in schools, workplaces, and community settings. Messaging and resources are adapted to be culturally appropriate and accessible.

Reducing inequities in cancer prevention requires a coordinated approach that combines universal strategies with targeted interventions. By embedding equity throughout, from risk reduction to early detection, the NCCP aims to ensure that everyone in Ireland, regardless of background or circumstance, has the opportunity to reduce their cancer risk and benefit from early intervention.

5. Action Areas

As outlined previously, the Ottawa Charter for Health Promotion provides the blueprint for fundamental strategies and approaches for health promotion for the NCCP Cancer Prevention Plan action areas. The actions outlined under each action area below provide a comprehensive framework for the implementation of strategies across the cancer prevention spectrum.

Secondary prevention of cancer in those who are at increased risk is an important element of this plan, as is tertiary prevention in those living with and beyond cancer.

These actions will facilitate a greater focus on these areas in addition to enabling the ongoing development of primary prevention strategies.

The Ottawa Charter calls for a comprehensive, multi-faceted approach to health promotion that applies diverse strategies and methods in an integrated manner and highlights the integral role of public-patient engagement. In addition, recognition of the influence of the social determinants of health on health outcomes is inherent in the Charter.

All of this is reflected in the actions outlined below which are underpinned by the overarching principles of collaborative and cross-sectoral working, equity, and monitoring and evaluation.

Action Area 1: Build healthy public policy

Building public health policy includes the development of legislation, fiscal measures, taxation and/or organisational changes that positively influence health outcomes. The aim must be to make the healthier choice the easier choice for populations.

No.	Action
1.1	Support and work with national policy programmes and strategies that influence cancer risk factors. This includes working with: HSE Alcohol Programme • HSE Tobacco Free Ireland • HSE Healthy Eating Active Living • Healthy Ireland • National Screening Service • Environmental Protection Agency • National Immunisation Office • Child Health Public Health • National Social Inclusion Office • National Skin Cancer Prevention Plan • Health and Safety Authority • National Health Protection Office • HSE Climate Programme • Public Health National Health Service Improvement • HSE National Health Intelligence Unit • Public Health National Health Improvement • Regional Departments of Public Health • Integrated Care Programme for Prevention and Management of Chronic Disease • HSE National Healthy Childhood Programme
1.2	Provide synthesis of best available evidence to respond to consultations on cancer prevention-related national measures
1.3	Advocate for the implementation and enforcement of policies that reduce exposure to carcinogens as part of the Irish Cancer Prevention Network
1.4	Support implementation of the Public Health Alcohol Act
1.5	Support Tobacco Free Ireland to achieve the goal of <5% smoking prevalence in Ireland
1.6	Support HSE Healthy Eating Active Living Programme to adopt and support strategies aimed at prevention of overweight and obesity
1.7	Identify and act upon opportunities to collaborate with government departments and bodies to promote cancer prevention in government policy e.g. healthy schools, healthy public spaces
1.8	Collaborate with Department of Health to incorporate cancer prevention in development of future National Cancer Strategies and other health policies

Action Area 2: Create supportive environments

Our societies are complex and interrelated: our work, home and social environments impact upon on health and our actions. Work and leisure should be a source of health for people. We can create supportive environments for cancer risk reduction by promoting living and working conditions that encourage cancer risk reduction.

No.	Action
2.1	Provide evidence-based cancer risk reduction information and resources, linking with clinical leads where appropriate
2.2	Provide cancer prevention awareness day calendar and resources for use by health and social care professionals including • community pharmacist through engagement with NCCP Systemic Therapy Programme (STP) programme • nursing through engagement with NCCP nursing programme • health promotion officers and community champions through engagement with HSE Health and Wellbeing and Healthy Ireland • cancer support centres through NCCP Cancer Survivorship programme • staff working with those with a genetic predisposition to cancer through the NCCP Hereditary Cancer programme
2.3	Support HSE staff health and wellbeing and occupational health to reduce cancer risk for staff
2.4	Advocate and work with local authorities to provide cancer risk reduction environments e.g. smoke-free public spaces, healthy food availability, safe recreational space, breastfeeding spaces

Action Area 3: Strengthen community action for health

Health promotion works through effective community action, involving communities in health promotion actions. This includes building on existing community health promotion initiatives that reduce cancer risk and working with HSE regions and high-risk communities in setting priorities, making decisions, planning strategies and implementing them to achieve better health.

No.	Action
3.1	Work to build resilience and sustainability in the SHPIO-CP workforce, ensuring a dedicated focus on community cancer prevention
3.2	Support SHPIO-CP to develop work plans that reflect the needs of regional population based on population profiles, and are also aligned with, and supportive of, NCCP national cancer prevention initiatives
3.3	Link SHPIO-CP with cancer centres to support cancer prevention work within the site-specific cancer teams (e.g. smoking cessation, local physical activity programmes, oncology staff expertise)
3.4	Develop a cancer prevention programme to recruit and upskill HSE staff and community organisation staff
3.5	Engage with Healthy Ireland and various community programmes of work, including healthy communities, healthy workplaces and healthy schools to support community work
3.6	Support and work with community organisations to create environments to encourage cancer risk reduction behaviours
3.7	Identify and engage with underserved populations support organisations to co-create cancer risk reduction initiatives e.g. Roma and Traveller communities, migrant communities, people living with a physical or intellectual disability, people living in Sláintecare healthy communities
3.8	Engage with support organisations for those who have a genetic predisposition or other increased risk of cancer, or a personal history of cancer, to co-create cancer risk reduction initiatives, e.g. the Alliance of Community Cancer Support Centres

Action Area 4: Develop personal skills

Developing personal skills through providing information and education for health and enhancing life skills. Improving knowledge of cancer risk reduction, both primary and secondary prevention, can be facilitated in school, home, work and community settings.

No.	Action
4.1	Undertake cancer awareness research with general population, and groups at high risk of cancer, to monitor cancer prevention awareness and behaviours
4.2	Develop and provide cancer prevention resources for the public, including relevance for those who have had a cancer diagnosis and those with an increased risk of developing cancer
4.3	Deliver public awareness initiatives on cancer risk reduction, including an annual social media calendar
4.4	Support delivery of Irish Cancer Prevention Network partners' cancer awareness programmes e.g. school's cancer awareness programme delivered by the Marie Keating Foundation
4.5	Co-ordinate the annual Irish Cancer Prevention Network World Cancer Day webinar for the public
4.6	Provide and promote cancer risk reduction e-learning programme to health and social care professionals, and link with NCCP Cancer Survivorship and NCCP Hereditary Cancer Programmes when updating material
4.7	Co-ordinate the annual Irish Cancer Prevention Network event for health and social care professionals
4.8	Embed evidence-based cancer risk reduction education in other HSE programmes e.g. MECC, sexual wellbeing education, schools training, positive ageing, men's health week
4.9	Include cancer prevention advice in relevant NCCP publications e.g. link with the NCCP Survivorship, Hereditary Cancer and Nursing programmes to include information in existing and new patient information
4.10	Contribute to the content included in Treatment Summary documents, including summaries produced using the National Cancer Information System (NCIS)

Action Area 5: Reorient health services

Aligning with the fundamental principles of Sláintecare (Prevention and Public Health – Patients accessing care at the most appropriate, cost-effective service level, with a strong emphasis on prevention and public health), and the newly established HSE Health Regions, we must change the focus of our health services, in cancer centres and community services, to incorporate cancer prevention. This includes an increased focus on cancer prevention research, as well as embedding cancer prevention in professional education and training.

No.	Action
5.1	Develop, publish and disseminate regional cancer prevention population profiles to inform regional cancer prevention priorities
5.2	Work with NCCP Systemic Cancer Therapy programme in the development of community cancer care champion role for pharmacists
5.3	Work with NCCP Nursing team to update reducing cancer risk/health promotion information within existing and new nursing education programmes
5.4	Work with NCCP Cancer Survivorship, Cancer Alliance, Nursing and Hereditary Cancer programme to upskill staff to discuss modifiable risk factors with those at high risk of developing cancer and those living well beyond cancer
5.5	Work with NCCP Evidence and Quality Hub to identify opportunities for targeted cancer prevention in those at increased risk of cancer when designing pathways and clinical practice guidance
5.6	Engage with healthcare professionals' governing and educational bodies i.e. ICGP, ONMSD, RCPI, RCSI, IIOP, NMBI and IGPNEA to integrate cancer prevention into professional education and training
5.7	Engage with healthcare workers at all levels (community, primary care, secondary care and tertiary care) to promote knowledge of and active involvement in cancer prevention
5.8	Engage with the implementation of the National Digital Health Strategy, in particular the development of the HSE shared care record and HSE patient app
5.9	Identify knowledge gaps relevant to cancer prevention and undertake, commission/support research to address these gaps
5.10	Input into development of National Cancer Research Strategy and NCCP National Cancer Research group to prioritise cancer prevention research in Ireland which informs community action for health

Action Area 6: Collaboration

Underpinning all these action areas is the collaborative and cross sectoral working. This includes building networks and supporting work internationally, nationally and regionally.

No.	Action
6.1	Engage with NCCP programmes annually to review potential collaboration opportunities • Systemic Therapy Programme • National Cancer Information System • Nursing • Cancer Survivorship • Hereditary Cancer • Evidence and Quality hub • Surgical and radiation oncology
6.2	Co-ordinate and expand the role of the Irish Cancer Prevention Network, to maximise outputs and impact
6.3	Co-ordinate the NCCP Cancer Health Promotion and Improvement Practitioner Network
6.4	Engage with regional departments of public health to share cancer prevention resources and initiatives
6.5	Engage with academic institutions, to identify and address gaps in Irish cancer prevention research
6.6	Collaborate with representatives of health regions to progress cancer prevention initiatives within health regions
6.7	Collaborate with Department of Health to input into policy and inform development of the next National Cancer Strategy
6.8	Contribute to EU joint actions in relation to cancer prevention

Action Area 7: Monitoring and evaluation

To assess impact and inform priorities it is important to monitor and evaluate the impact of the NCCP Cancer Prevention Plan.

No.	Action
7.1	Agree annual workplan plan, prioritising NCCP Cancer Prevention Plan Actions
7.2	Develop a monitoring and evaluation framework for the NCCP Cancer Prevention Plan
7.3	Publish an annual implementation report
7.4	Incorporate recommendations from annual implementation report into work plan for following year
7.5	Undertake annual evaluation of Senior Health Promotion Officers- Cancer Prevention programmes of work and SHPIO-CP practitioner network
7.6	Work with NCCP Cancer Intelligence on the development of the cancer control surveillance framework, ensuring relevant metrics for cancer prevention are included

Appendices

Appendix I

A review of international cancer prevention plans was conducted. This included a search of cancer prevention plans published in the last 10 years written in English. A search of health science databases and grey literature yielded 14 relevant publications. Please see table below for details.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
1	European Oncology Nursing Society	2021-2023	EONS Cancer Prevention Plan 2021-2023	Europe	Y	Nurses: As the largest group of health care providers (50%), nurses interact with people throughout their lifespan more than any other profession. This offers great opportunities to have an impact on people's health and to address the extensive problem of cancer-related health literacy, which plays such an important role in adopting preventive behaviours.	Document outlines a very specific plan on how to support nurses to deliver, and be involved in, primary prevention. Outlines exact action it would take i.e. nursing events, social media
2	Institut National du Cancer	2021-2023	2021-2030 France Ten-Year Cancer Control Strategy 2021-2025 Roadmap	France	N		A plan for overall cancer control. Specific chapter on cancer prevention, which targets specific risk factors, as well as acknowledging the role of the passive environment, targeting young people through schools, targeting high risk populations and the passive environment

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
3	Cancer Australia	2023	Cancer Australia, 2023. Australian Cancer Plan	Australia	N	The Australian Cancer Plan (the Plan) is designed to improve cancer outcomes for all Australians, and particularly for those groups whose health outcomes are poorest. The future-focused, ten-year Australian Cancer Plan is a national framework that will accelerate world-class cancer outcomes and improve the lives of all Australians affected by cancer. adolescents and young adults ` children ` people from culturally and linguistically diverse (CALD) backgrounds ` people living with disability lesbian, gay, bisexual, transgender, intersex, queer, and asexual (LGBTIQA+) people ` people in lower socioeconomic groups ` people living with a mental illness ` older Australians ` people living in rural and remote areas.	Overall cancer plan, for general population but with a focus on populations at higher risk (various ethnicity, LGBTIQA+, lower SES groups, living with a mental illness, living in rural/remote areas). Specific chapter on cancer prevention. Strengthen policy and regulations conducive to cancer prevention. Expand access to culturally tailored immunisation programmes. Develop a policy framework for genomics. Increase access and update of health assessments for specific at-risk populations. Deliver tailored and co-designed health promotion activities. Promote translation research to policy. Strengthen health literacy in high-risk populations.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
4	New South Wales Government	2022-2027	The NSW Cancer Plan	Australia	N	Communities that have poorer outcomes. Aboriginal communities.	Overall cancer control plan for general population, a focus on Aboriginal communities due to cancer inequity with this group. Prevention section; focus on health literacy amongst high-risk populations, focus on smoking & vaping, alcohol and UV, focus on use of digital tech to support health behaviour, focus on collaborative working
5	Department of Health	2022-2032	A Cancer Strategy for Northern Ireland 2022-2032	Northern Ireland	N	General population	Overall cancer control plan for general population. Prevention section focused on Smoking, Obesity, Diet and Physical Activity, UV, Alcohol, Infections, Oral Health, Environmental Pollution, Radon, chemoprevention, targeted surveillance and secondary prevention. Majority of actions related to supporting other national plans and raising awareness.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
6	New York State (NYS) Cancer Consortium	2018-2023	New York State Comprehensive Cancer Control Plan 2018-2023	USA	N		Overall cancer control plan. Has a focus on equity and populations at higher risk. Breaks prevention into the risk factors. Tobacco, Alcohol, Environmental and Occupational Exposure, Genetics and Family Health History, Physical Activity Nutrition and Breastfeeding, UV, Vaccine Preventable and Infectious Disease related cancers. Each risk factor has specific actions that relate to policy, legislation, environmental, working with other plans, education

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
7	North Carolina Advisory Committee on Cancer Coordination and Control	2020-2025	north carolina Comprehensive Cancer Control ACTION PLAN 2020 - 2025	USA	N		Overall cancer control plan. Prevention focuses on tobacco use, nutrition, physical activity, overweight, obesity, alcohol and environmental exposures. Preventive actions that a person and/or community can follow are included along with strategic actions. Promote behaviour change, policies, environments or other systems to reduce cancer risk. Bases actions on national Comprehensive Cancer Control Program Library of Indicators and Data Sources: Primary Prevention Indicators and Evidence-Based Strategies. https://www.cdc.gov/cancer/ncccp/index.htm

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
8	Utah Comprehensive Cancer Control Program	2021 - 2025	2021–2025 Utah Comprehensive Cancer Prevention and Control Plan	Canada	N	General population	A roadmap to eliminate cancer inequities and reduce the burden of cancer in Utah. The plan outlines four scientifically-supported and equity-focused cancer priorities: • Increase food security among Utahns • Create healthy neighbourhood environments in Utah • Improve access to high-quality healthcare services for all Utahns • Reduce financial toxicity among Utah cancer survivors Each priority includes the evidence that underpins its selection. Very focused areas, strong evidence base for each area.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
9	European Parliament and the Council		Europe's beating cancer plan	Europe	N	EU	Aims to raise awareness of, and address, key risk factors, focusing on health literacy, with a focus on disadvantaged groups, tobacco, alcohol, healthy diets and physical activity (including obesity), environmental pollution, hazardous substances and radiation, infections (vaccinations). Strong focus on the European Code for Cancer Prevention. The Cancer Plan also takes into account health determinants, including education, socioeconomic status, gender, age, and employment. In addition, attention should be paid to inequalities in access to prevention and cancer care, affecting for example elderly people, people with disabilities, or minorities.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
10	Wales Cancer Network	2023-2026	A Cancer Improvement Plan for NHS Wales	Wales	N		The primary focus of prevention is to address known risk factors such as tobacco smoking, obesity, diet, activity, alcohol, and sun exposure and to prevent these attributing causes of cancer. Focus on HPV. Primary, secondary and tertiary cancer services working together Support underserved communities including black Asian and minority ethnic (BAME) communities. Actions focus on monitoring change, embedding cancer prevention in primary and secondary care, local public health actions, HPV coverage
11	Scottish Government	2016	Beating Cancer; Ambition and Action	Scotland	N	General population	Overall cancer plan. Prevention has a focus on Tobacco, breast cancer focus, Alcohol, Obesity, UV and schools through embedding in existing initiatives i.e. the Tobacco Control Strategy, The Alcohol Framework, Preventing Overweight and Obesity in Scotland, schools Detect Cancer Early programme

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
12	Scottish Government	2023 - 2033	Cancer Strategy for Scotland 2023-2033	Scotland	N	General population	Underpinned by tackling health inequalities. Smoking, obesity, physical activity, alcohol, physical activity before, during and after treatment and UV. Embedding into existing plans (Tobacco Control Action Plan, Diet and Healthy Weight Delivery Plan, Active Scotland Delivery Plan, Alcohol Framework).
13	World Health Organization	2020	Global strategy to accelerate the elimination of cervical cancer as a public health problem	Global	Y	Global	The first global health strategy for the elimination of a cancer, cervical cancer, as a public health problem. Focuses on actions that can lead to elimination, vaccinations, screening, treatment and palliative care.

No	Author/ Owner	Year (start -end)	Plan Name	Country	Cancer Prevention Only (Y/N)	Target Population	Summary of document
14	NCCP Croatia	2019	National cancer control plan 2020 – 2030 The Republic of Croatia	Croatia	N	General population	Overall cancer plan. Focus on primary prevention includes 1. Promoting healthy eating habits and regular physical activity (increase awareness, access, introduce new and effective measures) 2. Smoking (reduce availability, increase awareness, smoke free environment, introduce new and effective measures) 3. Alcohol (increase awareness, availability) 4. Infections (awareness, eliminate Hep infection, HPV vaccination) 5. Lifestyle and environment (awareness, exposure through health and safety) Measures and economic evaluation

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6 North Carolina Comprehensive Cancer Control Action 2020 – 2025

7 A Cancer Improvement Plan for NHS Wales 2023-2026 Wales Cancer Network

8 Cancer action plan 2023 to 2026 The Scottish Government

9 National cancer control plan 2020 – 2030 The Republic of Croatia

10 2021-2030 France Ten-Year Cancer Control Strategy 2021-2025 Roadmap

11 New York State Comprehensive Cancer Control Plan 2018-2023

12 2021–2025 Utah Comprehensive Cancer Prevention and Control Plan

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