4TH INTERNATIONAL CONFERENCE ON CANCER PREVENTION 2024

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Tuesday/Wednesday, October 29/30, 2024

German Cancer Research Center (DKFZ)
Communication Center, Lecture Hall

ABSTRACT BOOK

German Cancer Research Center (DKFZ) | Im Neuenheimer Feld 280 | 69120 Heidelberg | www.dkfz.de

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Tuesday/Wednesday, October 29/30, 2024

German Cancer Research Center (DKFZ), Communication Center

WELCOME

Dear Friends & Colleagues,

We are delighted to welcome you to the 4th International Conference on Cancer Prevention. We are particularly pleased that so many participants can meet not only virtually, but also in person in Heidelberg. This inter- and multidisciplinary exchange is crucial for the development of cancer prevention – whether primary, secondary, and tertiary – across the entire spectrum, from basic research to practical implementation.

Cancer remains a major burden on society. By 2040, we expect an incidence of 30 million people per year, leading to a sharp increase in the number of patients and – fortunately – survivors. Prevention is one of the most powerful strategies to counteract this trend. It has considerable potential that has not yet been sufficiently exploited. Unfortunately, cancer prevention research is still a very small research field compared to the impact it could have. For the German Cancer Research Center and the German Cancer Aid, cancer prevention has been a high priority for many years, as there is an urgent need for comprehensive research in this area. We need to better understand how cancer develops, how the relevant processes can be detected, delayed, or even prevented, and how new research results can be implemented.

The International Conference on Cancer Prevention is a flagship event series hosted by the National Cancer Prevention Center (NCPC), a long-term strategic partnership between the German Cancer Research Center (DKFZ) and German Cancer Aid. This initiative is in line with the German National Decade against Cancer and serves as a concerted effort to highlight the importance of cancer prevention research.

This year's conference program aims to showcase the broad spectrum of cancer prevention research and to provide insight into the current state of research in various fields. With our conference, we aim to promote exchange between stakeholders while making this field of research more visible and attractive, especially for young scientists.

A central goal is to inspire and support young scientists for cancer prevention research. Therefore, the German Cancer Aid has launched the Cancer Prevention Graduate School, coordinated at the German Cancer Research Center, with 11 projects addressing the priorities “Basic Research”, “Public Health”, and “Communication”. Doctoral students receive state-of-the art interdisciplinary training and exchange ideas within a highly interconnected international environment.

We would like to thank all the speakers, program committee members, chairs, organizers, and participants for contributing to the success of this conference. We are very much looking forward to the numerous contributions and warmly welcome all scientific interactions and new collaborations.

The primary goal of cancer prevention is to fully exploit its enormous potential and make it accessible to the entire population. We must not lose sight of this goal. In this spirit, we wish you insightful lectures and discussions.

Sincerely,

Prof. Dr. Dr. h. c. Michael Baumann
Chairman and Scientific Director
German Cancer Research Center (DKFZ)

Gerd Nettekoven
Chairman
German Cancer Aid (Deutsche Krebshilfe)

CONFERENCE HOSTS

Michael Baumann
German Cancer Research Center (DKFZ), Heidelberg, DE

Gerd Nettekoven
German Cancer Aid, Bonn, DE

PROGRAM COMMITTEE, CHAIRS & PATIENT PANELISTS

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Heinrich-Heine-University Düsseldorf and DKFZ, Heidelberg, DE

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https://indico.dkfz.de/e/CCP20224

DESIGN

Dagmar Anders, DKFZ

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Federal Minister **Bettina Stark-Watzinger**,
German Federal Ministry of Education and Research, DE
Federal Minister **Karl Lauterbach,** German Federal Ministry of Health, DE

09:20 **OPENING KEYNOTE**
Chair: Ernest Hawk

Germline genetics, cancer risk, and interception strategies
Judy Garber, Dana-Farber Cancer Institute, US

10:00 Comfort Break

10:15 **BEHAVIORAL INTERVENTIONS FOR CANCER PREVENTION**
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Deconvoluting cancer precursors for primary cancer prevention
Rama Khokha, Princess Margaret Cancer Centre /UHN, CA

Towards AML Prevention: Detection and Intervention in Clonal Hematopoiesis
Lachelle Weeks, Dana-Farber Cancer Institute, US

Mapping the transition of normal tissue to lung cancer: What the cell is going on?
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WED, 30TH OCTOBER 2024

08:00 CHECK-IN & Welcome Coffee

08:30 **NETWORKING AND CAREER TALKS**

09:45 Comfort Break

10:15 **WELCOME BACK & UNDERSTANDING AND IMPROVING THE QUALITY OF LIFE OF CANCER SURVIVORS**

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Interventions for Sleep after Cancer
Joshua F. Wiley, Monash University, AU

Shifting toward precision survivorship medicine
Ines Vaz-Luis, Gustave Roussy, FR

Time to unravel the role of circadian dysregulation in fatigue after colorectal cancer
Eline van Roekel, GROW Research Institute for Oncology and Reproduction, Maastricht University, NL

Patient Panelist
Cindy Körner, NCT Patient Research Council, DE

11:45 **RAPID FIRE FLASH TALKS**

12:00 **POSTER SESSION**

12:45 Light Lunch

13:30 **CANCER SCREENING AND CHEMOPREVENTION**

Chairs: Peter Albers & Ulrike Haug

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Monique Roobol, Erasmus MC, NL

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Patient Panelist
Thomas Müldner, DKFZ Patient Advisory Council, DE

15:00 Coffee Break

15:30 **CLOSING KEYNOTE**
Chair: Philip Castle

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Cheryl Willman, Mayo Clinic Comprehensive Cancer Center, Rochester, US

16:10 **CLOSING REMARKS**

16:15 End of Conference

2. SPEAKERS' ABSTRACTS

Judy Garber

Dana-Farber Cancer Institute
Boston, United States

OPENING KEYNOTE

Germline genetics, cancer risk, and interception strategies

Dr. Garber is the Susan F. Smith Chair and Chief of the Division of Cancer Genetics and Prevention at Dana-Farber Cancer Institute and a Professor of Medicine at Harvard Medical School. She conducts research in clinical cancer genetics, with a special focus in the genetics of breast cancer. Dr. Garber is also a leader in research into the characteristics and treatment of triple negative breast cancer, the most common form in women with BRCA1 mutations and an expert in Li-Fraumeni Syndrome. Her translational research focuses on the evaluation of novel agents targeting DNA repair defects in breast cancer, including PARP inhibitors for treatment and prevention of breast cancer and other BRCA-associated cancers, and the study of other agents for reduction of breast cancer risk.

Dr. Garber is a past president of the American Association for Cancer Research (AACR). She served on the National Cancer Advisory Board of the National Cancer Institute and was elected into the American Society of Clinical Investigation, the American Association of Physicians and the National Academy of Medicine. She serves as the Scientific Director of the Breast Cancer Research Foundation and is a past chair of the Breast Cancer Research Foundation Scientific Advisory Board. She is an ASCO Statesman and a Fellow of the AACR Academy, and was its first president

Felix Naughton

University of East Anglia
Norwich, United Kingdom

Turning promise into practice: digital innovations for supporting cancer prevention behaviours

Digital interventions for changing cancer prevention behaviours have become abundant yet their impact has been modest at best and negligible at worst. In this talk I will outline my views on factors that likely limit the impact of such digital interventions and highlight several innovations that could circumvent these to enhance their impact and realise their potential.

Felix Naughton is Professor of Health Psychology within the School of Health Sciences, University of East Anglia (UEA) and a registered Health Psychologist. Felix leads a research programme focused on developing and evaluating digital interventions, primarily those targeting smoking cessation. He is particularly interested in innovative technology-mediated approaches to changing behaviour, such as Just-In-Time Adaptive Interventions (JITAIs), and learning about individual differences through N-of-1 experimental and observational studies.

Rebecca Beeken

University of Leeds
Leeds, United Kingdom

Weight management interventions for cancer prevention

There is strong evidence that obesity is associated with an increased risk of at least 13 different types of cancer. Multiple strategies exist to support individuals to manage their weight, including individual-level interventions and environmental/policy interventions. Interventions may focus on the prevention of weight gain in those not yet affected by excess weight and/or support weight loss in those already living with overweight and obesity. Individual-level weight loss interventions include surgical, pharmacological, and behavioural approaches, and there is increasing interest in targeting these interventions to those at increased risk of developing cancer, and/or offering intervention in relevant settings, such as cancer screening. There is also a recognition that more evidence is needed for the effect of these interventions on cancer risk. This talk will discuss the current evidence base, highlight methodological challenges, and suggest priorities for future research.

Dr Rebecca Beeken is an Associate Professor of Behavioural Medicine and Yorkshire Cancer Research Academic Fellow at the University of Leeds. She co-leads the Behavioural Oncology research stream within Leeds Institute of Health Sciences. Her research focuses on developing and trialling complex behavioural interventions to support physical activity, healthy eating behaviours and weight management both for the primary prevention of cancer, and to improve outcomes post-diagnosis
.

Monika Janda

University of Queensland
Woolloongabba, Australia

Targeted digital approaches to skin cancer prevention and early detection

In Australia, melanoma and other skin cancers are more common than all other cancers taken together and cost the health system more than $1.7Billion. Prevention and early detection are therefore critical to improve the outcomes for patients and system. Prevention and early detection interventions are now moving away from a one-size -fits all towards a precision approach. This includes understanding the specific genetic, behavioural and sociodemographic risk factors relevant for a person, and offering a prevention and early detection approach that is most appropriate for that person. In this presentation I will present some key examples of how a targeted approaches have been developed and are currently being tested in the Australian context, and discuss some of the benefits and difficulties with such approaches. I will also discuss how cancer prevention program implementation efforts are being supported by the EU-Horizon funded PIECES project.

Professor Monika Janda is the Director, Centre for Health Services Research, and Professor in Behavioural Science, at the Faculty of Medicine, University of Queensland. She trained as a health psychologist and is a behavioural scientist with a research background in cancer prevention, early detection and quality of life research.

Pauline Vidican

Department Prevention Cancer Environment, Léon Bérard Centre
Lyon, France

Prevention of modifiable cancer risks in informal family caregivers of cancer patients

Informal cancer caregivers can have an increased risk of cancer and the objectives of the study were to evaluate the feasibility and acceptability of a personalized primary prevention intervention (3PI) aimed at them. The study were conducted at the Léon Bérard Cancer Centre (Lyon, France), from 2022 to 2024, among informal family caregivers (first-degree relative or partner/spouse) who are adults and cancer-free. The 3PI targets tobacco, alcohol, diet, physical activity, overweight/obesity, ultraviolet exposure, and screening. It consists of an initial consultation and a 4-month follow-up consultation. In total, 117 informal cancer caregivers were included, of whom 48 attended the initial consultation (41%) and 37 the follow-up consultation (32%). All were satisfied with the entire 3PI. The PREV-CARE transferability study of the 3PI began in December 2022 in France (IGR), and in January 2024 in Italy (ISPRO) and Germany (BIPS).

With a clinical activity and also time dedicated to research, I work actively in the field of primary cancer prevention and health promotion. The challenge is to act on modifiable risk factors for cancer in target populations. We are developing various innovative approaches and devices for this purpose. In particular, I am in charge of developing a personalized primary prevention intervention for informal family caregivers of cancer patients at the Comprehensive Cancer Center Léon Bérard and of implementing it in various contexts.

Elisabete Weiderpass

International Agency for Research on Cancer
Lyon, France

Experience and perspective of the EU Cancer Mission

The EU Cancer Mission is a transformative initiative in the Horizon Europe framework, aimed at reducing the burden of cancer in Europe. It seeks to prevent over 3 million cancer cases by 2030, enhance early detection, improve quality of life for patients and survivors, ensure equitable access to care, and promote supportive policies. The mission's implementation strategies include funding cutting-edge research, fostering collaborative networks, engaging the public, integrating policy, and leveraging big data. Significant progress has been made, such as allocating over €1 billion to research, developing early detection technologies, implementing patient support programs, advancing policies, and launching public awareness campaigns. The combined efforts of EC Directorates such as DG Santé and DG RTD and also all the MS Ministries of R&I and Health within the Cancer Stakeholder Group, underscore the effectiveness of coordinated efforts and innovative approaches in combating cancer.

Dr Elisabete Weiderpass is Director of the International Agency for Research on Cancer (IARC), the WHO's specialized cancer agency, in Lyon, France. She took office in January 2019 and, in May 2023, was elected for a second 5-year term. Dr Weiderpass is an expert in cancer epidemiology and cancer prevention, with a particular interest in cancer registration, the understanding of cancers and the implementation of effective prevention strategies. She is a member of the EU Mission Board for Cancer, and scientific board member of several institutions, including Institut Gustave Roussy and INSERM.

Caitlin Weiger

Rutgers Institute for Nicotine and Tobacco Studies
New Brunswick, United States

Tobacco marketing as a commercial determinant of health: incomplete regulation of natural cigarette marketing in the U.S.

Smoking is a leading cause of cancer, with marketing playing a causal role in its establishment. Some cigarette companies, including Natural American Spirit (NAS), marketed their products using terms like “additive-free” (AF) and “natural” before receiving warnings letters that these terms made unauthorized modified risk and exposure claims. NAS was allowed to continue using “tobacco ingredients: tobacco & water” (TW), which has also been adopted by companies like L&M. We conducted an online experiment to determine if perceptions differed when exposed to AF versus TW claims on NAS and L&M packs to assess the effect of this regulatory change. Replacing AF with TW did not reduce low harm perceptions. Additional marketing regulations may be needed to keep companies from making unauthorized modified exposure claims. The regulatory authority of the US FDA, however, is balanced against the free speech rights of tobacco companies and the risk of lawsuits and is not a straightforward process.

Dr. Caitlin Weiger received her undergraduate training in psychology and her graduate training in social and behavioral sciences at the Johns Hopkins Bloomberg School of Public Health. She is currently a postdoctoral fellow at the Rutgers Institute for Nicotine and Tobacco Studies where her research focuses on tobacco policy and communication. Her work seeks to identify how to communicate the nuances of harm reduction more effectively to adults who smoke and study the effects of marketing and other communication changes on harm perceptions.

Theresa Marteau

University of Cambridge
Cambridge, United Kingdom

Why are we neglecting evidence that could change our behaviour and prevent 40% of cancers?

Changing four sets of behaviour – smoking, eating unhealthy diets, drinking alcohol and physical inactivity – could prevent about 40 % of cancers, 75 % of type 2 diabetes and heart disease. Information-based interventions aim to persuade people to change their behaviour with, at best, small effects. Interventions that change the environments that prompt and maintain these behaviours – including taxes and so-called nudges - have larger, more equitable effects. Only a minority of countries implement them Misleading ideas dominate thinking about changing behaviour including the beguiling quick fixes of information and nudges without regulation. Powerful minority interests are well-served by these ideas. Weak policy-making institutions provide insufficient checks on these, leading to ineffective policies. Protecting evidence from these forces is a priority to prevent millions of people each year from developing cancers avoidable by changing environments to change our behaviour.

Professor Dame Theresa Marteau is a psychologist and behavioural scientist at the University of Cambridge. Her research interests include: i. interventions to change behaviour (principally diet, tobacco and alcohol consumption) to improve population health equitably and sustainably, focused on targeting non-conscious processes ii. acceptability to publics and policy makers of government intervention to change behaviour She is a Commissioner for the EAT-Lancet 2.0 Commission focusing on making accessible to 10 billion people healthy diets produced within planetary boundaries.

Salvatore Vaccarella

International Agency for Research on Cancer
Lyon, France

Global cancer inequalities and inefficiencies in healthcare delivery

An overview of social inequalities in cancer between - and within - countries. Cancer is not equally distributed across countries and individuals. The scale and profile of cancer evolve over time, in parallel with the socioeconomic development of societies. While transitions towards better economic/living conditions provides many advantages, they also result in greater exposure to various cancer risk factors. However, it is always the most disadvantaged who are disproportionately hit harder. The role of the context and of the inefficiencies in delivering health-care services are crucial. Whereas disadvantaged individuals, who are most in need, cannot fully benefit from health-care services, citizens with higher access to the health system sometimes receive too much medical care. Overdiagnosis and overtreatment harm many individuals and represent a waste of resources, thereby preventing the reduction of the cancer burden and compromising the sustainability of health systems.

Salvatore Vaccarella interests focus on cancer epidemiology, with a strong interest on describing, understanding and characterizing social inequalities in cancer within the wider context of the global cancer transitions, patterns and trends of cancer. He also considers inefficiencies and potential harms in the provision of healthcare services. He is the coordinator of the Cancer Inequalities Team at the IARC.

Sudhir Srivastava

National Cancer Institute, National Institutes of Health
Bethesda, Maryland, United States

Building PreCancer Atlas toward Understanding the Natural History of Precancer

Studying the natural history of precancerous lesions and its malignant transformation will advance our understanding of carcinogenesis and will inform strategies to detect and intercept before lethal cancer develops. Morphological and histological studies, coupled with epidemiological data, have led us to develop an empirical natural history of the disease with numerous assumptions along with the progression of precancer to frankly malignant tumor. The NCI's Precancer Atlas program is shedding light on comprehensive understanding of the molecular, cellular, and tissue alterations and the interactions of the various cell types in precancer microenvironment (PMI) that drive tumor development and progression, particularly the progression from premalignant lesions to invasive cancer. The speaker will illustrate examples of spatial analysis of a variety of precancerous lesions revealing molecular and cellular changes at single cell levels which could have profound implication on improvements in risk stratification of precancerous lesions. Single-cell and spatially resolved cancer atlases, and efforts to build them in a coordinated manner, hold promise to accelerate and unify these impactful and fast-moving areas of cancer research for early detection and risk assessment.

Dr. Srivastava has established a number of transformative programs on translational research on cancer screening, early detection, risk assessment and enabling technologies including artificial intelligence with a network of leading experts in medicine, science, computational biology that has advanced scientific discoveries and revolutionized diagnostics in cancer early detection. In 2000, Dr. Srivastava developed and implemented a novel approach to collaborative clinical research on cancer biomarkers through the establishment of the Early Detection Research Network. He has published more than 321 peer-reviewed articles, including commentaries, book chapters, etc., and has receiverous international and national awards.

Rama Khokha

Princess Margaret Cancer Centre/UHN
Toronto, Canada

Deconvoluting cancer precursors for primary cancer prevention

Advances in screening and genetic testing are improving our ability to pinpoint individuals at the highest risk of developing cancer, yet, there is a discernible deficit in our ability to offer effective, non-invasive prevention options to manage those at high-risk. Transformation of cancer prevention requires that patients at high-risk have access to several options that make early intervention a reality with positive life-changing outcomes. Here at the Princess Margaret Cancer Centre, our dynamic, interdisciplinary team is focused on delivering novel strategies, that range from rare-cell detection to small-molecule drug interventions. Cancer cell precursors are the foundational targets to achieve molecular prevention, as they are infrequent in number and can be eliminated. Our program is focused on adult breast biology and mammary stem cells, the postulated cells-of-origin in breast cancer. We have produced multi-modal OMICs mammary cell resources and established a Discovery-to-Intervention pipeline to pinpoint therapeutic targets aimed at abrogating unwarranted oncogenic precursors. Specifically, we have identified a suit of new targets (epigenetic, metabolic, DDR) and are actively producing preclinical evidence to fuel primary prevention clinical trials.

Dr. Rama Khokha is a Senior Scientist and Professor. She received her PhD from Western University and von Humboldt Fellowship for postdoct training at EMBL. Her lab studies tissue homeostasis and adult stem cell niches. Her work was recognized by the Robert L Noble Prize from the Canadian Cancer Society in 2014. She is an elected Fellow of the Royal Society of Canada and currently holds a Tier 1 Canada Research Chair.

Lachelle Weeks

Dana-Farber Cancer Institute
Boston, United States

Towards AML Prevention: Detection and Intervention in Clonal Hematopoiesis

Premalignant expansions of cells with somatic mutations become widespread with age. A critical goal of cancer early detection is to identify individuals with premalignant states at greatest risk of progression. Clonal hematopoiesis (CH) is the premalignant expansion of hematopoietic stem cells with somatic mutations in leukemia-associated driver genes. CH is a precursor to blood cancers including acute myeloid leukemia (AML), myelodysplastic syndrome (MDS) and myeloproliferative neoplasms (MPNs). CH is diagnosed at increased frequency due to widespread use of clinical next generation sequencing. However, most people with CH will never develop a blood cancer. Creation of a screening and prevention program for requires the ability to identify at-risk populations appropriate for screening, effective tools to risk stratify those found to have CH, and interventions that improve overall survival by preventing transformation from CH to malignancy. We will review early efforts in these areas.

Dr. Lachelle D. Weeks is a physician-scientist at Dana-Farber Cancer Institute in the Department of Medical Oncology, an Instructor of Medicine at Harvard Medical School. Dr. Weeks is the director of the CHIP Clinic in the Dana-Farber Centers for Early Detection and Interception where she counsels patients who have clonal hematopoiesis. As an independent investigator in the Division of Population Sciences, Dr. Weeks's translational laboratory focuses on identifying risk factors for clonal hematopoiesis, understanding clinical and molecular features that predict risk of progression to overt malignancy, and designing strategies for early intervention to prevent adverse outcomes. Her work is supported by the American Society of Hematology, Robert Wood Johnson Foundation, Damon Runyon Cancer Research Foundation, Edward P. Evans Foundation for MDS, National Heart Lung and Blood Institute, and Breakthrough Cancer.

Humam Kadara

University of Texas MD Anderson Cancer Center
Houston, United States

Mapping the transition of normal tissue to lung cancer: What the cell is going on?

Earlier studies by our group and others identified molecular and immune changes in nearby normal-appearing tissue (NAT) that are shared with lung cancers suggestive of field carcinogenesis that is pertinent to malignant transition of NAT. This talk will go over our recent published work that characterized the landscape of normal and malignant lung epithelial cells in patients with early-stage lung adenocarcinoma (LUAD). We identify and characterize KRT8+ alveolar transitional cells that, unlike differentiated alveolar type II and I cells, harbor driver KRAS mutations as well as function as progenitors for LUAD. The talk will also briefly discuss some unpublished work on our efforts in multimodal single-cell and spatial omics analysis of NAT, premalignant lung lesions (PMLs) and LUADs in which we are identifying metaprograms, cellular clones and progenitors that underlie transition along the NAT – PML- LUAD pathologic continuum.

Dr. Humam Kadara is professor in the Department of Translational Molecular Pathology at The University of Texas MD Anderson Cancer Center. His laboratory made significant contributions to our understanding of the early pathogenesis of premalignant lesions and cancer. He authored and co-authored over 140 papers including in high impact journals like Nature, Nature Medicine, Cell, Cancer Cell, and Cancer Discovery.

Hermann Brenner

German Cancer Research Center (DKFZ)
Heidelberg, Germany

The Cancer Prevention Graduate School at the German National Cancer Prevention Center

The Cancer Prevention Graduate School (CPGS) was initiated, with support by German Cancer Aid (Deutsche Krebshilfe), in fall 2022 as the first graduate school for cancer prevention research in Germany. CPGS offers a comprehensive training program for excellent PhD candidates to become experts in cancer prevention research. The program provides training in key disciplines of cancer prevention research and fellows participate in regularly scheduled seminars, summer schools, retreats and research stays as visiting scientists. In this presentation, an overview will be given on the development, current status and future perspectives of the CPGS, which will be followed by *short presentations of selected dissertation projects*.

Hermann Brenner: 1985 MD, University of Tübingen, Germany; 1988 MPH in Epidemiology, University of North Carolina at Chapel Hill, USA; 1995-2000 Professor of Epidemiology, Head of Dept. of Epidemiology, University of Ulm; 2000-2005 Professor of Epidemiology, Heidelberg University; 2006 to now Head, Division of Clinical Epidemiology and Aging Research, German Cancer Research Center (DKFZ), Heidelberg; 2019 to now Chairman, Working Group Prevention, National Decade against Cancer; 2022 to now Scientific Coordinator, Cancer Prevention Graduate School, National Cancer Prevention Center, Heidelberg.

Sanne Schagen

Netherlands Cancer Institute International
Amsterdam, Netherlands

Improving care for cancer patients with cognitive problems

Cancer survivors often experience complications that limit their ability to work, reduce their participation in society, and lead to increased healthcare utilization and costs. Cognitive impairment is a common consequence of cancer and its treatments, affecting up to 75% of patients with primary or secondary brain tumors. However, it is less well known that approximately 30% of patients with cancer outside the central nervous system (CNS) also experience cognitive impairment, particularly after systemic therapy. This presentation will focus on cognitive impairment in the latter group, exploring its prevalence, nature, underlying mechanisms and available interventions. It will also offer suggestions for modernizing clinical practice to ensure appropriate and sustainable care for the growing population of cancer survivors with cognitive problems.

Sanne Schagen is a group leader and head of the Division of Psychosocial Research and Epidemiology at The Netherlands Cancer Institute, and a staff member at the University of Amsterdam. Her research centers around cognitive function in cancer patients and aims to develop clinically useful tools for defining and understanding cognitive decline and improving cognitive function. She is also embedded in the broader field of neuropsychology as the chair of the Dutch Neuropsychological Society.

Joshua Wiley

Monash University
Melbourne, Australia

Interventions for Sleep after Cancer

Poor sleep is common after cancer due to multiple factors. Despite its prevalence, sleep treatments and interventions are not routine in most cancer care. This presentation will introduce evidence-based, brief interventions to improve sleep after cancer and outline gaps and directions for future research.

Joshua Wiley is a Senior Research Fellow at Monash University; Honorary Research Fellow at the Peter MacCallum Cancer Centre; National Health and Medical Research Council Emerging Leadership Fellow.

Ines Vaz-Luis

Goustave Roussy
Villejuif, France

Shifting toward precision survivorship medicine

Survival rates for cancer patients have improved over recent decades due to advancements in early detection and treatment. However, many cancer survivors face significant physical, psychological, and social challenges post-treatment. For instance, over 50% of early-stage breast cancer survivors experience severe side effects, while more than 30% report emotional or social dysfunction and over 20% struggle to return to work. Research has aimed to stratify survivors based on their risk of treatment-related toxicities, but significant variability among individuals remains unexplained. Understanding the biological mechanisms behind this variability, particularly markers of systemic inflammation like cytokines, is crucial. Identifying actionable biomarkers can help tailor personalized care pathways from the point of diagnosis, advancing the field of "precision survivorship medicine." Additionally, many cancer survivors report unmet supportive care needs across various domains, such as information, physical health, and psychosocial support. This gap results from inconsistent care delivery and awareness of symptom management. Technology can enhance supportive care by creating accessible digital pathways that improve communication, deliver remote services, and empower patients to manage their health effectively, particularly for those in remote areas. In this talk, we will review examples of initiatives aimed at advancing precision survivorship medicine.

Dr. Ines Vaz Luis, a medical oncologist and researcher, is an international expert in quality of life after cancer (survivorship) and its assessment. At Gustave Roussy, she leads the medical-scientific program Interval, which focuses on post-cancer care with the goal of better identifying and preventing treatment-related toxicities. She is also the director of the Cancer Survivorship group within Inserm U981 and the deputy head of the interdisciplinary department for patient pathway organization (DIOPP). Nationally, she co-directs the scientific development of studies related to the CANTO cohort (CANcer TOxicities), which examines the toxicities experienced by women treated for localized breast cancer. The aim is to identify populations most likely to develop these toxicities and adapt their management accordingly.

Eline van Roekel

GROW Research Institute for Oncology and Reproduction, Maastricht University
Maastricht, Netherlands

Time to unravel the role of circadian dysregulation in fatigue after colorectal cancer: project overview and first results

Persistent fatigue is one of the most common and distressing long-term symptoms after colorectal cancer. The aim of this ongoing project is to investigate whether dysregulation of circadian rhythms is involved in the development of persistent fatigue among colorectal cancer survivors, and whether sedentary behavior and physical activity affect these rhythms. Longitudinal data are used from a prospective cohort study among stage I-III colorectal cancer survivors. First results show that a more optimal accelerometer-assessed diurnal rest-activity rhythm is longitudinally associated with less fatigue, and that less sedentary behavior and more physical activity are associated with a more optimal diurnal rest-activity rhythm up until 5 years after treatment. Future work will focus on the role of sleep and diurnal cortisol patterns. The results of this project can provide novel targets for developing tailored strategies to prevent and reduce fatigue after colorectal cancer treatment.

Eline van Roekel is an Assistant Professor at the Department of Epidemiology of Maastricht University. Her research lines are focused on unravelling the underlying biological mechanisms of persistent fatigue among colorectal cancer survivors, and how physical activity and sedentary behavior affect these mechanisms. In 2021, she obtained a personal grant of the Dutch Cancer Society focusing on circadian rhythm disturbance as underlying mechanism of fatigue after colorectal cancer. She is also involved in projects on the kynurenine pathway, inflammation and circadian eating patterns in fatigue.

Cindy Körner

Patient Research Council NCT Heidelberg, Germany

PATIENT PANELIST

Cindy Körner is a cancer researcher by training and works as scientist at the DKFZ. Her research is focused on the molecular mechanisms of breast cancer progression and therapy resistance. In 2020, Cindy was diagnosed with locally advanced breast cancer and underwent intense curative treatment at the National Center for Tumor Diseases (NCT) Heidelberg where she now engages in patient advocacy as a speaker of the local Patient Research Council. As a young cancer survivor, she supports efforts to promote research on long-term side effects of cancer therapies and on survivors' quality of life.

David Weinberg

Fox Chase Cancer Center
Philadelphia, United States

Multi cancer early detection: Ready or not?

Population level screening for some individual cancers reduces disease related incidence and mortality. However, most cancers including some that are common have no clinically useful screening test. As a result, unscreened cancers account for 60% of all cancer diagnoses and more than 70% of cancer deaths. Blood based testing (liquid biopsy) that can screen for multiple cancers simultaneously offers the promise of improved health not only because of the breadth of testing, but also (perhaps) because of greater testing efficiency and attractiveness to patients. This presentation will provide a balanced review of the current status of multi cancer early detection (MCED) testing and discuss issues which may have an impact on its more widespread use.

David Weinberg MD, MSc is Professor and Chairman of Medicine at Fox Chase Cancer Center where he holds the Audrey Weg Schaus and Geoffrey Alan Weg Chair in Medical Science. Fellowship trained in gastroenterology and cancer epidemiology, his research interests center on gastrointestinal cancer prevention and control with a particular focus on colorectal and pancreatic cancers. He has received continuous NIH funding to support his research efforts since completing his training. Since 2022, he has served as co-Editor-in-Chief of Gastroenterology.

Jack Cuzick

Queen Mary University of London
London, United Kingdom

Effect of oestradiol and testosterone on the efficacy of anastrozole for preventing breast cancer

An increased risk of breast cancer is associated with high serum concentrations of oestradiol in postmenopausal women. However, little is known about how it affects response to endocrine therapy – either for breast cancer prevention or treatment. In the randomized IBIS-II prevention trial of anastrozole in high risk postmenopausal women a 49% reduction in breast cancer was seen for anastrozole. Subsequently a case-control analysis of the effect of baseline serum oestradiol and testosterone levels on the development of breast cancer was conducted (Cuzick et al Lancet Oncology 2024). An increasing breast cancer risk with increasing oestradiol/SHBG ratio was found in the placebo group (p=0·0033), but not in the anastrozole group (p=0·60), and no benefit of anastrozole was seen in women in the lowest quartile. We also found the predictive value of certain risk factors such as body mass index were altered with preventive use of anastrozole. The side effect profile of anastrozole for profile of anastrozole for prevention will also be reported.

Interpretation: Measuring serum oestradiol concentration is inexpensive and should be integrated more routinely into risk management and adjuvant treatment decisions. Only baseline levels were studied here, but changes in level before and after treatment may also be useful markers of treatment effectiveness. Similar questions also need to be studied for tamoxifen.

Jack Cuzick,PhD and is the John Snow Professor of Epidemiology at Queen Mary, University of London and former director of the Wolfson Institute of Population Health. He has worked extensively in breast cancer prevention and HPV for cervical screening and prevention Dr. Cuzick is a Fellow of the Academy of Medical Sciences, the Royal Statistical Society, the Institute of Mathematical Statistics and an Honorary Fellow of the Royal College of Physicians, and was awarded a CBE by the Queen in 2017 and the and the AACR Cancer Prevention Prize in 2012.

Monique Roobol

Erasmus MC
Rotterdam, Netherlands

Population-based screening for PCa – the PRIASE-U initiative

The "PRostate cancer Awareness and Initiative for Screening in the European Union" (PRAISE-U) project aims to to support early detection and diagnosis of PCa through protocolized, risk-based screening programmes (https://uroweb.org/praise-u). Five national pilots have been initiated.

Monique Roobol is Professor Decision Making in Urology within the Dep. of Urology at Erasmus Medical Centre Rotterdam, NL. She is the PI of the ERSPC: www.erspc.org, co-developed the "Rotterdam PC Risk calculator" (www.prostatecancer-riskcalculator.com), and is (co)-PI of PRIAS (www.prias-project.org) GAP3 (https://gap3.movemberprojects.com/), PIONEER (https://prostate-pioneer.eu/), OPTIMA (https://www.optima-oncology.eu/) and PRAISE-U; https://uroweb.org/praise-u). Her motto is: "Bridging the gap between Epidemiology and Urology".

Alicia Morgans

Dana-Farber Cancer Institute
Boston, United States

Cancer Screening and Familial Genetic Risk: Prostate Cancer

Germline testing has increasingly been recommended by guidelines to be part of the treatment paradigm for patients with prostate cancer, even among individuals with localized disease and those without a family history if they meet certain high risk criteria. Integration of genetic testing in prostate cancer clinics has uncovered operational challenges in following the guidelines that vary by practice type and location, but has also resulted in inventive investigations that explore ways to support patients with fewer clinic-provided resrouces (Promise Prostate Registry, ProGen study, and others). This talk will explore these, as well as review recommendations for counseling and caring for family members without cancer who are increasingly in need of cancer screening programs after their relatives with prostate cancer are found to have germline mutations associated with a heritable cancer syndrome.

Alicia Morgans is an Associate Professor of Medicine at Harvard Medical School, a Genitourinary Medical Oncologist and the Medical Director of the Survivorship Program at Dana-Farber Cancer Institute. As a clinician and investigator, she has expertise in clinical trials and in combining clinical and molecular data with patient preferences in treatment decision making. Her research has been funded by grants from the Prostate Cancer Foundation, the National Comprehensive Cancer Network, and the US Department of Defense. She leads multiple therapeutic and quality of life focused clinical trials for prostate cancer patients, and has participated in studies of genetic testing, including the PROMISE Prostate Cancer Registry in the US.

Thomas Müldner

DKFZ Patient Advisory Council

PATIENT PANELIST

Thomas G. Mueldner is a divisional manager in the corporate clients segment of a major German bank. He holds a degree in law and studied at University of Heidelberg. In 2017 he was diagnosed with a locally advanced prostate cancer and was comprehensively treated in the urological clinic of the Mannheim University Teaching Hospital. Since 2023 Thomas is a member of the DKFZ Patient Advisory Council.

Cheryl Willman

Mayo Clinic Comprehensive Cancer Center
Rochester, United States

CLOSING KEYNOTE

Cancer Prevention in a Time of Transformation: From Engagement of Diverse Communities, to Genetic and AI-Driven Risk Assessment, Early Detection, Interception, and Decentralized Cancer Care and Clinical Trials

To address the cancer health disparities and needs of the highly diverse populations and communities Mayo Clinic serves across the U.S., as well as cancer patients who seek our care from across the nation and the globe, MCCCC has transformed its community engagement strategies and research programs in *Cancer Prevention, Control and Survivorship* and in *Risk Assessment, Early Detection, and Interception* to build upon Mayo Clinic strengths. These include: a comprehensive clinical precision medicine program (germline; tumor WES, WGS, transcriptome sequencing) for cancer patients and at risk individuals; the world's largest distributed federated healthcare data network with 32M patients (Mayo Clinic Platform Connect); cloud-based storage of 14M Mayo Clinic longitudinal patient records including digitized pathology and radiologic images, genomic and germline genetic analyses, and laboratory diagnostics; and use of artificial intelligence (AI) and digital and virtual tools to enable research and to transform the delivery of healthcare, cancer care, and precision community health *beyond our walls* to home and community settings.

Cheryl Willman, the Stephen and Barbara Slaggie Executive Director of MCCCC and the David A. Ahlquist Professor in Cancer Research is a distinguished physician scientist and cancer leader. She received her medical and residency training at Mayo Clinic with a NIH fellowship in immunology. She is an accomplished scientist in cancer genomics with a track record of translating discoveries to clinical trials. She is PI of one of 5 NCI-funded Participant Engagement-Cancer Genome Sequencing (PE-CGS) Centers: Engaging Indigenous American Indians (AI) in Cancer Genome Sequencing, focused on developing an AI reference genome and cataloging the spectrum of mutations in AI cancers. She has served on NCI Boards of Scientific Advisors, the NCI Frederick National, and is an NCI Cancer Equity Leader / Board Member for the NCI Center for Cancer Health Equity. She is an elected Fellow of the National Academy of Inventors.

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ABSTRACT HIGHLIGHTS

RAPID FIRE FLASH TALKS

01.....3 years results of the pilot personalized cancer prevention Interception program for individuals at high risk of cancers

L. Veron[1], P. Abdayem[1], M. Aupomerol[1], M. Bassail[1], T. Ben-Ahmed[1], C. Bladier[1], H. Caron[1], O. Caron[1], B. Claret[1], S. Cosconea[1], S. Delaloge[1], G. Esry[2], B. Fresneau[1], G. Garcia[1], A. Ilenko[1], M. Karimi[1], JB. Micol[1], T. Pudlarz[1], B. Raynard[1], A. Renneville[1]

[1] *Gustave Roussy,* [2] *Odyssea*

Personalized prevention appears as a major health improvement lever. Guidelines dedicated to individuals at high-risk (HRI) of several cancers exist but are scarcely implemented. The mixed community-hospital and physico-digital integrative pilot Interception program (IP) organises the personalised prevention and early detection pathways of HRI of several cancers using existing guidelines. Its 4 pillars are: identification of HRI in the community, multidisciplinary One Stop clinic (OSC) allowing assessment, education and participation and ending in a shared personalized prevention plan (PPP), annual digital follow-up and fast-track care if needed. So far 8 pathways have been developed for HRI of breast, lung, pancreatic cancers, myeloid neoplasia and germline mutations carriers. We analysed IP's results after 3 years of pilot program.

Up to 04/30/24, 1679 participants attended the OSC. All visits ended in a shared PPP. Prevention targets were identified in 92% of attendees. Existing screening plans were modified in 75% of cases. Awareness (perception of knowledge regarding the situation) increased by an average of 65%. At 1 year, the WCRF score increased of at least 1 point in 30%, and 95% of participants adhered to their screening program.

The IP pilot program demonstrated feasibility and early impact. It is currently being deployed in 8 French centers.

02.....Avoidable Deaths in 185 Countries for 34 Cancer Sites: The Contribution of Risk Factor Preventable and Treatable Cancers

Oliver Langselius[1], Harriet Rumgay[1], Jérôme Vignat[1], Hadrien Charvat[1], Mark Rutherford[1], Freddy Bray[1], Isabelle Soerjomataram[1]

[1] *Cancer Surveillance Branch, International Agency for Research on Cancer (IARC)*

Introduction: Cancer-specific incidence, mortality, and survival disparities exist worldwide. Avoidable deaths have recently been used to estimate disease burden and inequalities between countries.

Methods: Five-year net survival (NS) estimates were obtained from the SURVCAN-3 project and a literature review for 34 cancer sites. NS was obtained with a regression model versus HDI level for 185 countries. Age-specific survival was estimated using patient data patterns. Attributable fractions for five major risk factors were included. Risk factor preventable and treatable deaths were estimated for 2022 and scaled to IARC's GLOBOCAN incidence estimates.

Results: In total, 4.4 million (48.6%) cancer deaths are potentially risk factor preventable (3.1 million (34.1%)) and treatment improvements (1.3 million (14.5%)). A significant proportion avoidable deaths can be found across country income levels but affect low/ middle-HDI countries disproportionately. The total proportion avoidable deaths range from 28.9% in Sweden to 70.6% in Uganda.

Discussion/Conclusion: Our analysis provides a detailed map of global avoidable cancer death disparities by treatment and risk factor prevention, indicating where resources should be allocated. Prevention should be a priority, but as its impact can take decades, global efforts are also needed to address present screening and treatment inequalities.

03.....Plasma proteomic profiling integrated with genetics identify protein biomarkers for gastric cancer

Xue Li[1], Lingbin Du[1], Bin Liu[2], Yingying Mao[2], Wenhao Shi[3], Juan Zhu[1]

[1] Zhejiang Cancer Hospital; [2] Zhejiang Chinese Medical University; [3] Tsinghua University

Aims: This study aims to identify plasma proteomic biomarkers underlying the etiology of gastric cancer (GC) and their potential for early detection.

Methods: A comprehensive plasma proteomic characterization of GC was conducted through LC-MS/MS in a case-control study involving 100 GCs and 94 non-cancerous controls. Mendelian randomization analysis and machine learning methods were conducted for biomarkers validation and model construction.

Results: A total of 4652 highly reliable plasma proteins were identified in our case-control study, of which 918 proteins were significantly associated with GC. Elevated levels of 9 proteins and decreased levels of 3 proteins were associated with an increased risk of GC. APOC1, TPI1 and C9 were selected for constructing the diagnostic model. Our diagnostic model demonstrated superior performance (AUC=0.97) compared to traditional clinical risk factors (AUC=0.75). The model showed a sensitivity of 95%, which was significantly higher than that of clinical blood-based biomarkers. The findings remained consistent when analyses restricting to early GC.

Conclusions: Our study highlights the potential of plasma proteomics for accurate screening and early detection of GC. Furthermore, it provides insights into the etiology of GC.

04.....Head-to-head comparisons of lung cancer risk prediction models: a systematic review and meta-analysis

Clara Frick[1], Teresa Seum[1] , Megha Bhardwaj[1], Tim Holland-Letz[1], Ben Schöttker[1], Hermann Brenner[1]

[1] *German Cancer Research Center (DKFZ), Heidelberg, Germany*

Objective: This systematic review and meta-analysis summarizes head-to-head comparisons of the performance of risk models in predicting lung cancer (LC).

Methods: The databases PubMed and Web of Science were searched for primary studies up to April 3, 2024. Articles comparing the performance of LC risk models in an independent, external validation cohort of ever-smoking participants were included. Meta-analyses were conducted to synthesize differences in the area under the curve (AUC) of two models compared in multiple populations, weighted by sample size.

Results: In total, 14 eligible studies were included, comprising 3,913,298 ever-smokers, of whom 43,435 (1.11%) developed LC within 5 to 7 years. Among the nine models that were compared, AUC differences reached up to >0.10 between two models. LCRAT consistently had a higher AUC than any other model, with AUC differences ranging between 0.03 to 0.08. PLCOm2012 had higher AUCs compared to all models except LCRAT.

Discussion: Our review discloses major differences in predictive performance of widely used LC risk models, with the LCRAT and PLCOm2012 models consistently outperforming alternative LC risk models.

Funding: The study was conducted as part of the LUCIA consortium, funded by the Horizon Europe program (grant agreement no. 101096473).

lung cancer; risk prediction; meta-analysis; review, systematic; area under the curve

05.....Development and external validation of a tumor DNA methylation panel for stage II colon cancer recurrence risk stratification

T. Yuan[1], H. Brenner[1], D. Edelmann[1], M. Hoffmeister[1]

[1] *German Cancer Research Center (DKFZ), Heidelberg, Germany*

Background: Determining tailored surveillance and treatment strategies for stage II colon cancer (CC) after curative surgery remains challenging, and personalized approaches based on molecular markers are lacking. Aim: To identify a gene methylation panel for recurrence risk stratification among patients with stage II CC. Methods: Genome-wide tumor DNA methylation data from 562 stage II CC patients in Germany (DACHS study) were split into training (N = 395) and internal validation sets (N = 131). External validation was performed in 97 patients from a Spanish CC patient cohort. A Prognostic index (PI) was constructed based on markers selected in the Elastic Net Cox model, which was compared with clinical variables alone using time-dependent AUC and Brier scores. Results: Age, sex, tumor stage, location, and 27 methylation markers were selected. The PI outperformed the baseline model regarding AUC (e.g., 1-year AUC: internal set, PI: 0.66, baseline: 0.52; external set, PI: 0.72, baseline: 0.64). However, the PI showed no improvement in the prediction accuracy of CC recurrence. Conclusion: We identified 27 tumor DNA methylation biomarkers that improved the discriminative power in classifying recurrence risk among stage II CC patients. These markers offered no improvement in prediction accuracy for clinical applications but might be useful if combined with data from other modalities.

06.....Changes of Lifestyle and Breast Cancer Risk in Postmenopausal Women from the EPIC cohort

Fanélie Vasson[1], Komodo Matta[1], Carine Biessy[1], Bertrand Hemon[1], Vivian Viallon[1], Edoardo Botteri[2], Pietro Ferrari[1], Laure Dossus[1]

[1] Nutrition and Metabolism Branch (NME), International Agency of Research on Cancer (IARC) – World Health Organization (WHO), Lyon, France; [2] Section for Colorectal Cancer Screening and Department of Research, Cancer Registry of Norway, Oslo, Norway

Various lifestyle factors have been associated with breast cancer risk, yet the evidence is limited on the impact of changing lifestyle habits on risk among European women. This study aims to investigate the relationship between changes in the healthy lifestyle index (HLI) and breast cancer risk, among women from the EPIC cohort. Baseline and follow-up questionnaire data on alcohol consumption, smoking, BMI and physical activity were used to calculate HLI scores ranging from 0 to 16 units, with higher scores reflecting healthier behaviours. Among 125,746 eligible female participants, 2,451 incident breast cancer cases were observed over a median 4-year follow-up. Cox proportional hazards models, with age as the timescale, were used to estimate hazard ratios (HR) with 95% confidence intervals (CI) for associations between HLI changes and breast cancer risk. Additionally, changes in each HLI component were examined within a mutually adjusted model. Continuous HLI changes were not associated with breast cancer risk (HR 0.99; 95% CI 0.97-1.01). However, a one-unit increase in BMI score, indicative of weight reduction, was inversely associated with breast cancer risk (HR 0.91; 95% CI 0.86-0.97). Adopting healthier behaviours during adulthood did not have a significant impact on postmenopausal breast cancer risk, while losing weight may be beneficial, particularly after menopause.

07.....Thirteen simple lifestyle scores and risk of chronic diseases and mortality: prospective cohort study in the UK Biobank

Jie Ding[1], Hermann Brenner[1], Michael Hoffmeister[1], Ben Schöttker[1]

[1] *German Cancer Research Center (DKFZ), Heidelberg, Germany*

Lifestyle scores were developed for single non-communicable diseases (NCDs), but might also be useful for predicting other NCDs. To benchmark and extend the use of lifestyle scores, in 76,399 participants from the UK Biobank, we prospectively assessed the association of 13 lifestyle scores with incidence and mortality of major NCDs, defined as a composite of cancer, cardiovascular disease (CVD), and type 2 diabetes (T2D). Over a median follow-up of 10.5 years, 12,214 developed NCDs and 2,250 died from NCDs. Higher lifestyle scores were associated with reduced risk of NCDs (HR range 0.65 to 0.89) and NCD mortality (0.51 to 0.92) when comparing the highest to the lowest category of all 13 lifestyle scores in fully adjusted models. Among the 13 scores, the Chronic Disease Risk Index (CDRI) (HR 0.65, 95% CI 0.62 to 0.70), Healthy Lifestyle Score (HLS) (0.65, 0.61 to 0.70), and Empirical Lifestyle Pattern Score for Hyperinsulinemia (ELIH) (0.71, 0.67 to 0.75) showed the strongest associations with incident NCDs, while CDRI (0.51, 0.44 to 0.59), HLS (0.54, 0.45 to 0.63), and Health Behaviors Score (HB) (0.58, 0.50 to 0.68) showed the strongest reductions for NCD death. The consistent predictive ability for CVD, T2D, and cancer should encourage collaborative efforts among organizations related to leading NCDs to develop common lifestyle recommendations to reduce the burden of NCDs.

08.....Impaired nucleotide metabolism due to p53 deficiency leads to replication stress and chromothripsis

G. Philippos[1,2], F. Devens[1], A. Ernst[1], M. Hergt[1], B. Kerem[3], J. Korbel[4,5], O. Lazareva[4,6], J. Otoničar[1,2], G. Sigismondo[7], P. Smirnov[1,4], O. Stegle[4,6,8], W. Zaatra[3]

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Chromothripsis (CT) is a form of genome instability detected in 30 to 50% of cancer cases. It is one of the earliest events known to happen in a tumour. However, the mechanistic basis of CT is still largely unclear. Early events in cancer evolution are challenging to capture in humans, as fully developed tumours are analysed in most studies.

We performed longitudinal analyses using a unique model of spontaneous CT, namely primary fibroblasts from Li-Fraumeni syndrome patients (germline TP53 variant) to study CT without artificial induction.

Phenotypic profiling identified chromosome bridges, multipolar spindles and micronuclei already at early passages. DNA sequencing revealed a high diversity of CT events at early passages and later selection of dominant clones. We showed telomere stabilization shortly after the crisis, leading to dominant clones. "Winning subclones" showed extrachromosomal circular DNAs and gene fusions. RNA sequencing and mass-spectrometry-based proteomics identified critical pathways that play a role in CT initiation and in clonal dominance after CT. We also unveiled a potential novel mechanism of replication stress following wild type p53 loss due to nucleotide mis-regulation, which leads to DNA damage and micronuclei driving CT initiation.

Altogether, this research will lead to a better understanding of the underlying biological processes leading to CT.

09.....SOX9 Expression in Colorectal Adenomas Improves Surveillance Colonoscopy Risk Stratification in a Bowel Screening Population

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Adenomas are precursors to colorectal cancer (CRC). Current UK surveillance guidelines use polyp size, number and histology to stratify patients at risk of metachronous polyps/CRC. However, these guidelines are poor at predicting risk, often leading to under/oversurveillance. Adenomas removed from 1257 patients at index colonoscopy were retrospectively used to investigate mutational profile and protein expression trends associated with detection of metachronous polyps/ CRC. The presence or absence of metachronous polyps/CRC was recorded 0.5-6 years after index polypectomy. APC and KRAS were mutated in 87% and 34% of patients, respectively. Both significantly co-occurred with SOX9 mutations (APC 17% p=0.047 and KRAS 23% p=0.012). High cytoplasmic SOX9 expression significantly associated with detection of metachronous polyps/CRC (HR 1.543, p=0.001) and improved risk stratification when combined with current guidelines (HR 2.626, p<0.0001). High cytoplasmic SOX9 expression alone and in combination with current guidelines was an independent predictor of metachronous polyps/CRC according to various regression models. Validation in an independent test dataset confirmed that high cytoplasmic SOX9 expression significantly associated with detection of metachronous polyps/CRC (HR 1.654, p=0.012) and enhanced risk stratification when combined with current guidelines (HR 2.473, p=0.0018).

10.....The mediating role of the kynurenine pathway in associations between diet and fatigue in colorectal cancer survivors

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Our previous work revealed associations of diet with kynurenine pathway metabolites (kynurenines), and of kynurenines with fatigue in colorectal cancer (CRC) survivors. We examined if the kynurenine pathway mediates the association of diet with fatigue in CRC survivors.

Measurements at 6 weeks, 6 months, and 1 year post-treatment were performed in 208 stage I-III CRC survivors. Diet was assessed by 7-day food records. Plasma kynurenines were analyzed using LC/MS-MS. Fatigue was assessed with a validated questionnaire. We used confounder-adjusted multilevel parallel-multiple mediator models with all kynurenines included as mediators to estimate total, direct, metabolite-specific indirect, and total indirect effects through all metabolites of diet on fatigue.

Total and direct effect estimates showed that higher intakes of total carbohydrate and mono- and disaccharides, and lower intakes of plant protein, total fat, and magnesium were statistically significantly associated with more fatigue. The direct effect estimate for higher magnesium intake with less fatigue was also statistically significant. No total indirect effect estimates or mediator-specific indirect effects were statistically significant.

In this study, the kynurenine pathway did not mediate the association between diet and fatigue in the first year after CRC treatment. Larger studies are needed to repeat this finding.

CANCER PREVENTION GRADUATE SCHOOL SHORT TALKS AND POSTER

11.....A novel PROTAC-mediated degradation model of ETV6::RUNX1+ preleukemia reveals ATF4- stress response pathway inhibition

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Background: The translocation t(12;21)(p13;q22) is the most common genomic alteration of pediatric B cell precursor acute lymphoblastic leukemia (BCP-ALL), forming the chimeric transcription factor ETV6::RUNX1 (ER) which induces a preleukemic state. Understanding of ER-mediated processes may aid on childhood leukemia prevention.

Aims: Identification of novel cellular pathways altered by ER.

Methods: NALM-6 BCP-ALL cells expressing the ER fusion construct were treated with PROTAC3 for ER degradation or left undegraded. RNA sequencing (RNA-seq) and proteome analysis assessed expression changes.

Results: PROTAC3 treatment degraded ER as confirmed by Nano-Glo HiBiT Assay and immunoblot. ER expression induced 3.3-fold more significantly downregulated differentially expressed genes compared to the degraded control. Ingenuity Pathway Analysis identified ATF4 as the most inhibited upstream regulator in ER+ cells. Data revealed a downregulation of ASNS on RNA (2.54-fold) and on protein (1.16 fold) level in ER+ cells which aligns with higher L-asparaginase sensitivity of ER+ leukemia. Furthermore, the MILES Study documents a downregulation of ATF4 and multiple of its target genes in ER+ leukemia compared to other subtypes or healthy patients.

Conclusion: We identified inhibition of the ATF4-stress response pathway in ER+ preleukemia and overt BCP-ALL which confers a promising therapeutic target.

12.....Effectiveness of smoking cessation interventions during pregnancy: A Systematic Review and Meta-analysis

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Background: Pregnancy and childbirth are critical for smoking cessation, especially in diverse, socially disadvantaged families. This study reviews interventions to reduce smoking and second-hand smoke exposure during pregnancy in these groups.

Methods: Following PRISMA guidelines, a systematic review was conducted in five databases. Studies involving pregnant women, their smoking partners, and diverse demographics were included. Two reviewers independently screened and extracted data.

Results: A meta-analysis of 59 articles showed that multifaceted interventions using various formats and modern delivery methods like web and mobile apps are effective. In addition to that, successful interventions are tailored to meet the unique needs of culturally diverse families, emphasising socioeconomic inclusiveness and community involvement. Lastly, fathers' inclusion in the interventions varied from active to non-involvement.

Discussion: This review highlights the role of fathers in smoking cessation during pregnancy and the development of smoke-free environments. It outlines the vulnerabilities and barriers in creating interventions, proposing a co-designed cessation program incorporating feedback from stakeholders and target populations.

13.....Enhancing Efficacy of the German Screening Colonoscopy Program by lowering starting ages and extending screening intervals: A Modelling Study

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Introduction: In Germany, two screening colonoscopies (CS) are offered 10 or more years apart for men starting at age 50 and women at age 55. Full compliance with these offers would result in CS at ages 50 & 60 in men and 55 & 65 in women. Our aim was to explore whether and to what extent the efficacy of utilizing two CS could be enhanced by adjusting different starting ages and screening intervals to colorectal cancer (CRC).

Methods:We modelled expected numbers of CRC cases, CRC deaths, potential years of life lost (PYLL) and disability adjusted life years (DALYs) due to CRC in hypothetical cohorts of 100,000 men and women aged 45-85 using COSIMO, a validated Markov-based Multi-state Simulation Model. Model strategies included combinations of starting ages (45/50/55/60) and CS intervals (10/15/20 years).

Results: For men, CRC deaths could be slightly reduced by extending the interval to 15 years, with a second CS at 65. PYLL and DALYs were strongly reduced by decreasing starting age to 45. For women, use of two CS at ages 50 & 65 reduced all CRC burden parameters compared to the current earliest-use offer at 55 & 65 years.

Discussion: Lowering the starting ages of CS to 45 years for men and 50 years for women, and extending the screening interval to 15 years, may enable more effective use of the two CS currently offered in Germany.

14.....Prospective evaluation of 92 protein biomarkers for early detection of endometrial cancer

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Background: The human epididymis protein 4 (HE4) remains the best available endometrial cancer (EC) biomarker, however its discrimination between cases and cancer-free individuals is limited, and could be improved with its inclusion in multimarker panels.

Methods: We evaluated the discrimination capacity of 92 proteins as potential early detection biomarkers for EC in nested case-control studies in the EPIC and Janus cohorts, evaluating blood samples taken ≤2 years prior to diagnosis. Proteins were measured with the Olink Target 96 Oncology II panel assays. Areas under the ROC curves (AUCs) were calculated using logistic regression.

Results: The discrimination between cases and controls of top performing proteins was modest (EPIC: HE4, CA125, CAIX, and S100A4; Janus: HE4, CA125, FURIN, CXCL13, and IL6; AUC >= 0.65 within 0-<12 months of blood collection) and decreased as the time between blood draw and cancer diagnosis increased (AUCs all ≤ 0.69 12-24 months). The combination of these other markers with HE4 did not improve discrimination.

Conclusions: HE4 and other candidate markers had limited discrimination between EC cases and controls, especially at longer lag-time intervals. The combination of single markers with HE4 did not lead to improvements in discrimination between EC cases and controls. HE4 and the other markers do not appear to be of use for EC early detection.

15.....ESPRIT: Pilot testing of a social prescription and virtual patient information to increase tertiary prevention in oncology

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Introduction: Tertiary prevention in the sense of physical activity (PA) can improve cancer patient outcomes. However, the uptake of tertiary prevention remains low. ESPRIT will investigate the effectiveness and implementability of innovative behavioral strategies to improve the health behavior of cancer patients and their support persons.

Methods: This pilot RCT assesses the effectiveness of a social prescription (intervention A) and virtual patient information (intervention B) in improving PA among cancer patients (N=90) when compared to usual care (intervention C, control). The primary endpoint is the difference in step count assessed via accelerometer between baseline and months 12. Secondary endpoints include self-reported QoL and self-efficacy. Implementation barriers and enablers as well as cost-effectiveness will be explored. The social prescription has been developed by a multidisciplinary team using patient-reported outcome data and preprogrammed algorithms (intervention A). Virtual patient information have been recorded (intervention B).

Results: Data of baseline assessment and first follow-up will be presented.

Discussion: ESPRIT explores which strategies are effective in increasing tertiary prevention among cancer patients and support persons, and how they could be integrated into clinical practice. The findings can be used to help deliver optimal patient-centered care.

16.....Early Detection and Prevention of Gastroesophageal Adenocarcinoma: Analyzing the Microenvironment during Disease Progression

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Background: Although it is known that Barrett´s Esophagus (BE) is a major risk factor for Gastroesophageal Adenocarcinoma (GEAC), efficient early detection for BE to GEAC transition remain unclear. An environmentally driven inflammation is likely affecting cardia stem cells and should be considered as the most important risk factor. Thus understanding the whole (tumor-) microenvironment of BE and GEAC are critical to identify BE progressors.

Methods: To understand the relationship between cell compartments of the (tumor-)microenvironment in a human disease setting, we will perform multi-parameter single-cell protein analysis by mass cytometry (CyTOF) in combination with RNA sequencing of epithelial and stromal compartments after laser capture microdissection on PAXGene fixed tissue samples of 20 progressors versus non-progressors obtained from the BarrettNET registry.

Expected Results: Our hypothesis that BE arises from cardia stem cells and that the microenvironment fuels transition to malignant cells have been confirmed on human BE samples in the past, but the exact understanding of this process remains elusive. Our RNA sequencing and CyTOF based methods have the resolution to detect these and other focal events including the spatial relationship of different cell types.

Conclusion: Summarized, we aim to improve the understanding for BE to GEAC transition.

17.....Mutation analysis for hematologic and cardiologic risk management in patients with CHIP

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In the past decade, clonal hematopoiesis of indeterminate potential (CHIP) has emerged as a significant risk factor linking somatic mutations with aging, hematologic neoplasms, and cardiologic diseases. Detected in the blood, CHIP is characterized by clonally expanded (variant allele frequency, VAF ≥2%) somatic mutations in cancer-associated genes, predisposing individuals to hematologic neoplasms like MDS and AML. High inflammatory signatures in mutated clonal macrophages contribute to the pathophysiology of CHIP-related myocardial infarction and stroke. Aging is a major risk factor for CHIP, together with smoking or chronic sleep deprivation. Understanding CHIP mutational landscape and clinical implications is essential for personalized risk assessment. We aim to identify individuals at high risk for CHIP, focusing on patients with early-onset cardiovascular disease and breast cancer patients with BRCA1/2 mutations who previously received cytotoxic therapy. Screening techniques include Whole Exome Sequencing (with 400x coverage) as well as Whole Genome Sequencing. Patients identified with CHIP will receive counseling in our outpatient clinic. Furthermore, we aim to elucidate underlying mechanisms leading to CHIP by correlating the clinical course of disease with patterns of mutational and cytogenetic evolution.

18.....Analysis of nutrition and associated epidemiological risk factors in a cohort of Barrett Esophagus patients

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Gastroesophageal adenocarcinoma (GEAC) represents a rapidly escalating malignancy. Barrett's esophagus (BE), a recognized premalignant condition, is frequently diagnosed, yet a substantial cohort of BE patients remains undetected. This underscores the critical need for the identification of individuals at heightened risk and of efficacious preventative strategies.

We utilized the BarrettNET registry, a longitudinal cohort study with a decade of follow-up and comprehensive data collection, including biopsies, serological analyses, and demographic, lifestyle, and health-related information from 850 subjects. On these data we applied logistic regression to a nutrition score and its associated variables to discern patterns of disease progression versus non-progression.

Although the overall nutrition scores did not differ between groups, a granular assessment revealed a higher intake of meats and processed sausages among individuals with dysplastic changes or established GEAC. This subgroup exhibited a higher prevalence of overweight/obesity, a greater incidence of habitual smoking, and a marked reduction in physical activity compared to the BE cohort without dysplasia.

While epidemiological parameters alone do not suffice for individualized risk stratification in GEAC prevention, the insights gleaned from this analysis advocate for targeted modifications in lifestyle factors.

19.....Evaluation of Educational Interventions to Enhance Cancer Literacy: a Pilot Study (CLARO)

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Background: Modifiable lifestyle risk factors could prevent almost 40% of cancer cases. However, awareness of these risk factors is low in the general population. Thus, improving cancer literacy (CL) regarding prevention behaviors could be an essential step in reducing people's cancer risk.

Objective: This mixed-method pilot study assessed and evaluated different information materials created to heighten participants' CL. Based on the results, the materials will be adapted for the main study.

Methods: We developed information materials using various communication styles (non-narrative text, narrative text, non-narrative animation, and narrative animation) based on the Protection Motivation Theory. A total of 41 participants were randomly assigned to one of the 4 groups. A semi-structured guide was used for the qualitative part.

Results: Overall, participants agreed (40%) or fully agreed (42.5%) that they liked the information material. In qualitative interviews, participants recommended a more straightforward text layout. We received mixed feedback regarding the amount of information. We will be able to present the final results at the conference.

Discussion: Preliminary results from the pilot study indicate that the information materials developed are suitable to be tested in the main study. Different aspects of the information material, such as clarity, seem particularly important.

20.....Psychological impact of individualized risk-assessment for familial prostate cancer risk (PROFAM-PSYCH): Study Protocol

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Objective: The novel prevention center for familial prostate cancer (PCa)ProFam-Risk has been established at Düsseldorf University Hospital, enabling individualized risk-assessment and risk-adapted recommendations. The subproject ProFam-Psych investigates the psychological impact of this novel form of PCa prevention.

Method: Participants are compared to a control group (CG) of urolithiasis patients in a prospective mixed-methods observational design. Clinical assessments, mpMRI, genetic testing and counseling are offered. Psychological variables are collected at 4 time-points in the case group (CAG) and 2 time-points in the CG. A subgroup of participants will be interviewed. Primary endpoint is PCa-specific anxiety (MAX-PC), secondary endpoints include risk-perception and perceived control. Recruitment aim are n=225 (CAG) for longitudinal analysis and n=118 (CG) for baseline group comparisons based on Power analysis for rm-ANOVAs.

Results: Recruitment started Sept. 2023, 68 participants have been included(CAG=40,CG=28). PCa-specific anxiety at baseline is expected to be higher in the CAG than in the CG and a decrease in PCa-specific anxiety over time in the CAG is hypothesized.

Conclusion: This study will provide extended knowledge about the impact of risk-adapted PCa-prevention on PCa-specific anxiety, holding the potential of enhancing standard clinical care for men with familial PCa.

21.....Polygenic Risk Score for a population-based risk adapted breast cancer screening – implementation and evaluation of consequences for German women

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Background: In Germany, women aged 50-70 years are invited to mammographic screening for early breast cancer (BC) detection. For high-risk women risk-adapted screening starting at younger ages is implemented in clinical practice.

Study Aim: To assess the impact of risk-adapted screening, specifically using individual characteristics and a polygenic risk score (PRS).

Methods: We use risk factor data from 9,000 women (440 BCs) in KORA, a prospective population-based German cohort. We estimate hazard ratios for the associations of risk factors and PRS with BC risk. We calculate 10-year BC risks from the model Canrisk. We use micro-simulations to generate BC outcomes using estimates on lead time and latency under two scenarios: First, start screening when 10-year estimated risk exceeds an age-specific risk threshold and second, start screening when 10-year estimated risk at age 40 exceeds age-specific thresholds. The numbers of women needed to screen (NNS) to detect one BC case for the two approaches are compared.

Expected Results: We expect that risk-adapted mammography screening strategies can effectively identify breast cancer in high-risk women aged 40-49, while reducing screening frequency for lower-risk women aged 50-69. Incorporating PRS may further lower NNS.

Conclusion: We plan to illustrate the potential of personalized screening in improving BC early detection.

22.....Developing and assessing of a new biomarker panel for early detection of lung cancer and personalized interventions – *in vivo*

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Lung cancer is the most lethal cancer type and accounts for 13 % of cancer cases and 22 % of cancer-related deaths in Germany, noting the need of its early detection.

In this project, we aim to identify changes in plasma protein patterns of peripheral blood that predict early lung cancer in otherwise asymptomatic patients. We will use a genetically engineered mouse model, which precisely mimics development and progression of human lung cancer. This will allow us to observe tumor-induced changes in the systemic environment in relation to cancer progression. Our study includes obese and old cohorts to identify age and obesity's impact on the systemic environment in combination with cancer. Serial blood samples will undergo the highly sensitive PEA assay (Olink) and flow cytometry analysis. Our flow cytometry lymphoid panel enables visualization of lineage markers in wild-type mice as well as good separation of other populations, allowing precise characterization of the samples. The identified signatures will be compared with lung cancer patients' signatures at various stages. Protein signatures will be further analyzed to uncover shared pathomechanisms between cancer and cardiovascular pathophysiology. Currently, we are setting up the age cohort (included by the end of 2024). The results of the first two cohorts (normal & obese) are expected to be available at the conference.

BEHAVIORAL INTERVENTIONS FOR CANCER PREVENTION

23.....Maternal weight during pregnancy and risk of childhood acute lymphoblastic leukemia in offspring: A nationwide cohort study

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Background: Maternal exposures during pregnancy are critical for leukemogenesis in offspring since childhood leukemia often originates in utero. We aimed to investigate the association between the risk of childhood acute lymphoblastic leukemia (ALL) in offspring and maternal anthropometrics during pregnancy, including gestational weight gain (GWG) and maternal body mass index (BMI) in early pregnancy.

Methods: We conducted a nationwide cohort study. 2,964,813 singletons born in Sweden during 1983-2018 were included and followed from birth to ALL diagnosis, age 18, or 2018. Standardized incidence ratios (SIRs) adjusted for potential confounders were calculated to compare ALL risk in different exposed groups.

Results: 1,446 children were diagnosed with ALL during follow-up. We observed an increased risk of ALL in daughters of mothers with overweight or obesity in early pregnancy (SIR 1.4, 95% CI 1.2-1.6), compared with those of mothers with normal BMI. This association was not found in sons (SIR 1.0, 95% CI 0.9-1.1). We did not find an association between low or high GWG (both SIR 1.0, 95% CI 0.9-1.1) and risk of ALL in offspring.

Conclusion: Our findings suggest that maternal overweight or obesity is an important risk factor for childhood ALL in daughters. Further research into causes of the observed sex difference may provide a new avenue for ALL prevention or treatment.

24.....Serum lipid traits and the risk of gastrointestinal cancers: A cohort study of 430,905 participants in the UK Biobank

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Aim: To investigate the association between serum lipids and the risk of major gastrointestinal cancer (GIC, inlcuding oesophagus,stomach and colorectum cancer) in the UK Biobank, a prospective cohort study.

Methods: Serum levels of total cholesterol, high- and low-density lipoprotein cholesterol (HDL-C, LDL-C), and triglyceride were measured at study baseline. Multivariable adjusted cox models were used to estimate Hazard ratios (HR) and 95% confidence intervals (CI).

Results: A total of 430,905 eligible participants were included with 8,857 incident primary GIC cases during a median follow-up of 11.80 years. Higher level of HDL-C and triglycerides were associated with higher risk of GIC (HR: 1.08, 95% CI: 1.01-1.16, P=0.027 for HDL-C and HR: 1.03, 1.01-1.06, P=0.002 for triglycerides) while the higher serum level of cholesterol and LDL-C were associated with lower risk of GIC (HR: 0.98, 0.96-1.00, P=0.013 for cholesterol and HR: 0.95, 0.93-0.397, P=2.82x10-5 for LDL-C). Moreover, participants with both unfavorable levels of liquids and high genetic risk have the highest risk of GIC.

Conclusions: The serum level of total cholesterol, LDL-C, HDL-C and triglyceride were modestly associated with GIC risk. Future investigations are warranted to replicate our findings in other populations and elucidate the role of blood lipids in the carcinogenesis of GIC.

25.....Antidiabetic drugs and risk of colorectal cancer: A nationwide cohort study

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Background: Studies have shown inconsistent results for the association between the use of first-line antidiabetics drugs and colorectal cancer (CRC). This study aims to determine if single/combined uses of first-line antidiabetics (biguanide, insulin, and sulfonylurea) are associated with an increased risk of CRC.

Methods: This large nationwide cohort study leveraged data from several Swedish nationwide registers (follow-up: 2006-2018) to compare the risk using standardized incidence ratio (SIR).

Results: 11,345,299 individuals (including 310,076 diabetics) were included and followed for up to 12 years. Compared to those without diabetes in sporadic CRC, diabetics without antidiabetics had a 2-fold increased risk of CRC (95%CI=1.9-2.1), and this association did not significantly change among diabetics on different drug regimens (SIR for biguanide=1.8, 95%CI=1.7-1.9, insulin=1.9, 95%CI=1.7-2.1, sulfonylurea=1.8, 95%CI=1.3-2.2), all with overlapping 95% CIs even in the combination therapy. Similar pattern observed in familial CRC. In a direct comparison of insulin/sulfonylurea users (or combinations) with biguanide users, we also did not find significant difference in terms of CRC risk.

Conclusion: Although diabetes is associated with an increased risk of CRC, antidiabetic drugs do not appear to play a significant role in this association and do not differ by the medication type.

26.....Alcohol consumption, polygenic risk score and the prevalence of advanced colorectal neoplasms

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Alcohol consumption and polygenic risk are established colorectal cancer (CRC) risk factors. However, evidence on how they independently and jointly affect the risk of advanced colorectal neoplasms is limited. We evaluated these associations among 3,341 participants of screening colonoscopy using multiple logistic regression models. The polygenic risk was evaluated by a polygenic risk score (PRS) based on 140 CRC-related loci. For risk communication, we translated adjusted odds ratios (aORs) to genetic risk equivalents (GREs), quantifying the effect of alcohol consumption in terms of the difference in PRS going along with the same increased risk. Moderate and high (12-<25 and ≥25 g/d) alcohol consumption was associated with increased risk of advanced colorectal neoplasms (aOR [95% CI] 1.27 [1.03-1.57] and 1.44 [1.15-1.82]). No interaction between alcohol consumption and PRS was observed. Participants with high alcohol consumption in the highest PRS tertile had a 3.4-fold increased risk of carrying an advanced neoplasm. The aOR of high alcohol consumption translated into a GRE of 27, meaning that its impact was estimated to be equivalent to the risk caused by 27 percentiles higher PRS. Alcohol consumption and PRS independently contribute to advanced colorectal neoplasm risk. The effect of alcohol abstinence may be similar to having a substantially lower polygenic risk.

27.....Effectiveness of behavioural interventions for oral cancer prevention: an evidence and gap map

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Introduction: Oral cancer ranks as 16th most common cancer globally. There are major gaps in oral cancer prevention research, which have not been identified and reported systematically and comprehensively. We have developed an evidence and gap map (EGM) to provide a visual display of the available evidence and thus research gaps on primary and secondary interventions for oral cancer prevention. This abstract focused on behavioural interventions for smokeless tobacco (SLT) or areca nut (AN) cessation.

Methods & Results: The map is based on the comprehensive review for the IARC Handbook Volume 19 on Oral Cancer Prevention and was developed using the EPPI-Reviewer and EPPI-Mapper software. Rows of the map represent the interventions (i.e. behavioural interventions) and columns represent the outcomes (i.e. SLT/AN cessation quit rates or risk ratios). At the intersection of a row and column, the circles indicate the number of studies (size) and the study design (colour); in addition, general and specific filters were developed to provide study details. Additional analyses were conducted based on the map.

Conclusion: This map identifies research gaps in oral cancer prevention and enables easy access to available evidence by public health professionals and policymakers worldwide, especially in countries in need of such preventive efforts.

28.....Improving young people's knowledge about cancer prevention: results of a school-based intervention study

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Effective cancer prevention is most successful when educating adolescents about relevant risk factors and possibilities of prevention. This requires appropriate interventions – particularly in school setting, as this potentially compensates for social disadvantages. Thus, we developed evidence-based teaching materials, e.g., on carcinogenesis and risk factors such as human papillomavirus (HPV).

To investigate whether teachers' use of the materials can effectively improve students' knowledge, we conducted an intervention study in a pretest-posttest design with students in grades 6 to 13. Questionnaires with multiple-choice questions on the respective content of the teaching materials were answered at three times: Once before and twice (immediately after, four weeks later) after the respective lesson. A total of *N* = 85 students participated in all three survey waves for carcinogenesis and *N* = 119 for HPV.

Repeated-measures analyses of variance showed that both teaching materials significantly improved students' knowledge. Post-hoc comparisons with Bonferroni correction revealed a significant increase in knowledge from the first to the second and third measurement. The results underline the need for school-based interventions to improve young people's prevention knowledge as prerequisite for preventive behavior.

29.....Muscle-strengthening activities in the baseline examination of the German National Cohort (NAKO)

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Background: Physical activity reduces the risk of various types of cancer. The physical activity guidelines published by the World Health Organization (WHO) recommend a combination of muscle-strengthening activities (MSAs) and moderate-to-vigorous intensity aerobic PA (MVPA). However, MSAs are understudied.

Methods: We used data from the baseline examination of the German National Cohort (NAKO) to examine participation rates for MSAs and adherence to the corresponding WHO guideline (≥2 days/week, at least moderate intensity). Data were collected via the Questionnaire on Annual Physical Activity Pattern. Due to the lack of a consensus definition of MSAs, we used one conservative and one liberal operationalization.

Results: Valid data were available for 40,599 participants. Depending on the operationalization, between 17.1% and 42.7% of participants engaged in MSAs in the previous twelve months. Between 8.9% and 17.4% of participants performed MSAs in accordance with the WHO guideline. Values were considerably higher for MVPA.

Conclusions: Less than one in five participants performed MSAs at the recommended frequency and intensity, which is well below other (inter)national estimates, even though the part of the WHO guideline stating that all major muscle groups should be involved could not be evaluated. MSAs were the limiting factor in overall physical activity guideline adherence.

30.....Knowledge, Awareness and Attitude on HPV (Human Papilloma Virus) infection, Vaccine and Cervical Cancer Screening among the school Students in Rajasthan (north India)

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Cervical cancer is a major cause of cancer deaths in rural Indian women due to low awareness of HPV and screening. HPV vaccination is cost-effective, and the Indian government recently announced a mass vaccination program for girls aged 9-14. There's a strong need to raise awareness about HPV vaccination.

This study aimed to (i) assess adolescent students' awareness and knowledge about HPV infection and vaccination, and (ii) evaluate the impact of an educational intervention. Using a cross-sectional pre-test and post-test design (January-December 2023), students from classes 6-12th were selected via proportional random sampling. Baseline data were collected before a 45minute educational intervention based on the health belief model, PowerPoint presentation and Q&A session on HPV burden, risks, pathology, vaccination, screening, and related cancers. Post-intervention data were collected and analyzed using chi-square tests and logistic regression.

Among 1140 students (84% girls,16% boys), 17%of fathers and 21%of mothers were illiterate. Initially, 22%of participants knew of HPV,19% knew about the vaccine & 17%knew about HPV-related cancers. Post-intervention, significant improvements in knowledge, perception, and vaccination willingness were observed. Structured educational interventions effectively enhance HPV awareness, knowledge, vaccine acceptability among adolescents.

31.....Communication on vaccination against human papillomavirus (HPV) on Twitter

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Background: Social media play an important role in the dissemination of information. This research project aims to describe the content of information about HPV vaccination on social media in order to improve communication strategies about HPV vaccination.

Methods: We used a social media monitoring tool (Meltwater) to record German-language posts on HPV vaccination on Twitter (now X) for the year 2022. The data were analysed according to the place of publication, author, reach and topics.

Results: We recorded around 2,500 German-language posts, of which 55% indicated Germany or another German-speaking country as the author's location, while 41% didn't specify the author's location. The authors of the posts were individuals (69%) and organisations (21%). Posts written by organisations had a greater reach (12 million) than those written by individuals (3.6 million).

The major topics of the recorded posts were the importance and recommendation of HPV vaccination as an effective measure to prevent HPV-related cancers (29%), costs as barriers (17%), criticism and opposition to HPV vaccination (14%), questions and information seeking (10%) and other (30%).

Conclusion: Organisations acting in the field of HPV prevention should make greater use of social media to provide evidence-based positive information about HPV vaccination, which could increase the awareness of HPV vaccination.

32.....Implementation of the cancer prevention project “Krebs vorbeugen statt nachsehen” in Mecklenburg-Vorpommern

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The rising number of cancer cases in Mecklenburg-Western Pomerania leads to an expanding burden on local health systems. Considering that 40 to 60% of all cancers could be avoided through primary prevention measures, the CCC-MV (funded by the state Mecklenburg Vorpommern) designed a prevention program "Krebs vorbeugen statt nachsehen". Together with patient representatives, self-help groups and clinicians several modules were designed to promote health-related behavior targeting avoidance of alcohol and tobacco consumption, optimizing diet, foster exercise and stress management.

The first prevention module for pupils grade 7/8 was adapted from Cancer Centers in Hamburg and Aachen and implemented in Rostock, targeting tobacco consumption.The implementation has started in March 2024 with 350 students from Rostock. The module includes three parts: education on cancer and smoking risks, observation of a bronchoscopy, and interviewing a lung cancer patient. Concurrently, the project is being evaluated to prove its effectiveness.

The results of the survey in March indicated a positive reception among the pupils. 84.4% of participants answered “yes” or “rather yes” when asked if they would recommend the project to other students.

The “Nichtrauchen ist cool” prevention project was successfully launched at Rostock site in March 2024 and will be started in Greifswald in September 2024.

33.....Working conditions and the risk of breast cancer: a cohort study

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Background: Breast cancer is the most commonly diagnosed cancer worldwide and exposure to risk factors, including low physical activity, unhealthy diet, and overweight, plays a role in its occurrence. While the effects of lifestyle-related factors have been frequently studied, the role of occupational factors are not well known. We aimed to assess the effects of working conditions on breast cancer risk.

Methods: Data from the UK Biobank were used, a large-scale cohort study including 21820 women between 40 and 69 years old with information on working conditions, without breast cancer at baseline. Incident cancer diagnoses were verified through the linkage with cancer registries. Cox regression was used to estimate the association of working conditions with the incidence of breast cancer.

Results: 705 breast cancer cases were diagnosed during 15 years of follow-up. Preliminary analyses showed an association of night shift work with breast cancer, but not of number of working hours, heavy manual or physical work, and mainly walking or standing jobs. Analyses with more detailed measurements of night shift (length of exposure, frequency per month, cumulative number of night shifts, and length of night shift in hours) are ongoing.

Conclusion: Night shift work is associated with an increased risk of breast cancer risks. Further studies are needed to understand potential mechanisms.

34.....The associations of selenium status with cancer mortality: a systematic review and meta-analysis of observational studies

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Objective: To provide a systematic review and meta-analysis of population-based, observational studies on the association of selenium (Se) status with cancer mortality.

Methods: Relevant studies were identified through systematic searches of Medline and ISI Web of Knowledge. Hazard ratios (HRs) reported across categories of Se status were recalculated as continuous HR estimations by one standard deviation (SD) using generalized least squares for linear trend estimation and pooled in random effects meta-analysis.

Results: A total of 1946 records were identified. Of those, 46 studies remained for full-text review, and six eligible studies with 1,977 deaths due to cancer among 26,009 participants were included for meta-analysis. The pooled risk estimate showed a 17% lower cancer mortality per SD serum/plasma Se/selenoprotein P increase (HR [95% confidence interval], 0.83 [0.73-0.95]). The heterogeneity was moderate (I2, 58%). No publication bias was not observed.

Conclusion: This is the first systematic review and meta-analysis of observational studies that reported an inverse association of Se status with cancer mortality in the older general population. Well-designed large trials on Se supplementation, especially among participants with low Se status, should be conducted to confirm this relationship with cancer mortality and provide evidence for Se supplementation recommendations.

35.....The Dutch Cancer Atlas: geographical variation of cancer incidence in The Netherlands providing opportunities for prevention

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Background: Understanding geographical variation in cancer incidence is crucial for identifying causes, developing prevention strategies and promoting healthier lifestyle behaviors. This project aimed to assess and visualize the geographical variation in cancer incidence in the Netherlands in a publicly accessible interactive application.

Methods: We adopted the Australian Cancer Atlas methodology. Data was used from Netherlands Cancer Registry (patient) and Statistics Netherlands (population), 2011-2020. Per zip code area, smoothed 10-yr overall and sex-specific Standardized Incidence Ratios were calculated for 24 cancer types and all cancers.

Results: The Dutch Cancer Atlas (www.canceratlas.nl) displays estimates of cancer incidence with level of uncertainty, for each small area in the Netherlands. It provides information on cancer types, patterns and potential underlying causes. The atlas reveals cancer type specific variations in geographical distribution, e.g. lung and skin cancer, whereas breast cancer is less pronounced.

Conclusion: The Dutch Cancer Atlas shows geographical variation in cancer incidence. We reach a large audience and raise awareness amongst e.g. policy makers and health professionals, stimulating several initiatives (e.g. local prevention campaigns). We encourage research into causes of geographical variation and implementation of targeted prevention strategies.

36.....Information on Cancer Prevention: Interests, Attitudes and Preferences in the German Population. A Representative Survey

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Background:To design and implement effective cancer prevention information, understanding interests, needs and attitudes of different target groups is essential. A representative survey aims to provide this foundation.

Methods: A standardized 21-item questionnaire was used in face-to-face interviews in November 2023. The sample was expanded for certain groups and then factor-weighted to reflect the population composition.

Results: A total of 1.581 individuals aged ≥ 16 were surveyed. Only 12% assessed their cancer risk as high. 65% described their lifestyle as healthy, half of them contradictory to stated habits. 60% felt well informed about cancer prevention, 30% expressed a need for further information. Reasons for not using screening services included various reservations as well as a lack of knowledge. In terms of attitude and interest in prevention information, the population can be categorized into five segments: active and less active patients, precautionary, accessible and indifferent individuals. Interest in prevention information exists to varying degrees across groups, with a preference for personal consultation with a doctor.

Conclusions:The need for information on primary prevention appears particularly significant. Personal counselling might enhance self-efficacy and promote preventive behaviour. Communication can be tailored to the identified segments.

37.....Factors Influencing Smoking Cessation in Patients with Lung or Head & Neck Cancer: Insights from a French longitudinal study

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Background: Despite the significant health benefits of smoking cessation after a cancer diagnosis, a third of lung and head and neck (H&N) patients continue to smoke post-diagnosis. We aimed to identify barriers and facilitators influencing cessation in this specific population.

Methods: Patients newly diagnosed with H&N or lung cancer (n=503) residing in Lille, France were recruited between 2012 and 2017 and were interviewed after diagnosis, and at three, six, and 12 months. Multivariate Cox regression models estimated associations between self-reported tobacco cessation and the following: age, sex, education level, employment status, marital status, BMI, cancer stage, treatment type, age of cigarette initiation, smoking duration, nicotine and alcohol dependence, cannabis use, and psychiatric disorders.

Results: 51.8% of smokers ceased tobacco smoking during the follow-up. Being older, female, married, and living with someone were positively linked to smoking cessation. Factors negatively associated with cessation included low BMI (≤22), late-stage cancer, at-risk or harmful alcohol consumption, younger age at tobacco initiation, greater pack-years (≥ 50 pack years), mixed tobacco product use, and nicotine dependence.

Conclusions: Further analyses are underway to clarify which factor(s) are independently associated with smoking cessation in patients with lung or H&N cancer.

POLITICS OF PRIMARY CANCER PREVENTION POLICIES

39.....Advertising for alcohol on Instagram in Germany

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Background: Alcohol advertising increases the initiation of drinking, the amount of alcohol consumed and is associated with alcohol abuse. In Germany, advertising for alcohol is only banned in cinema before 6 pm.

Methods: In September 2023, December 2023 and January 2024 we collected German posts related to beer on Instagram using a social listening tool. Search terms were defined and search strategies were developed. The posts were categorised and systematically analysed.

Results: We identified 1,305 German posts about beer. Two-thirds of the posts were from commercial accounts (breweries, shops, restaurants, bars), about one-third were from influencers. The most prominent themes of the posts were taste, special offers, lottery and community. Drinking alcohol was portrayed as a desirable lifestyle choice, even for younger people. One in five posts from breweries targeted young audiences with marketing messages such as friendship or individuality, often using sports or memes to attract attention.

Conclusions: Our study shows for the first time in Germany the extent of alcohol advertising on Instagram. Young users of the platform are exposed to advertising for a harmful product. To protect adolescents and young adults from alcohol advertising, a comprehensive ban on alcohol advertising is needed.

40.....Public support for voluntary school-based vaccination against human papillomavirus (HPV) infection in Germany

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Background: School-based HPV vaccination is an effective strategy for achieving high vaccination rates. The aim of our study is to find out to what extent the German population would support such a program.

Methods: In 2022 and 2023, a telephone survey including 2,017 persons aged 14 years and older were conducted. Participants were asked about their support for voluntary HPV vaccination in schools in Germany. The data were analysed by gender, age, education level, place of residence.

Results: Overall, the majority of respondents (70%) support voluntary HPV vaccination programs in schools. Support for voluntary HPV vaccination in schools was higher among men (72%) than women (67%).

Support for voluntary HPV vaccination programmes in schools was particularly high among adolescents aged 14-17 (86%), adults aged 40-49 years (73%) and respondents with a high level of education (76%). It was low among respondents aged 70 years and over (62%) and those with a low level of education (62%). There were regional differences in support for voluntary school-based HPV vaccination, with high support in Schleswig-Holstein (89%) and low support in Mecklenburg-Western Pomerania (57%).

Conclusion: The surveys show strong public support for a voluntary HPV vaccination programme in schools. Decision-makers should therefore take this into account for the introduction of such program in Germany.

41.....Effect of programmes on inequalities in colorectal cancer screening participation across Europe

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Background: Socioeconomic position and social support can contribute to inequalities in colorectal cancer (CRC) screening participation. However, screening programmes may help alleviate these inequalities. Our goal was to assess how socioeconomic position and social support affect men's and women's participation in CRC screening, and to what extent programmes modify these inequalities.

Methods: We used logistic regression to analyse nationally representative population survey data from 29 European countries, drawing from the 2014 (N=117,531) and 2019 (N=121,563) waves of the European Health Interview Survey.

Results: Individuals with a lower socioeconomic position and fewer social support resources had a lower CRC screening uptake. The association between screening uptake and social support was stronger among men. Screening programmes contributed to mitigating these effects. In countries that rely on opportunistic screening (without programme), socioeconomic position and social support variables remained associated with screening uptake for both men and women.

Conclusions: Cancer screening programmes may contribute to reducing inequalities in screening participation. Preventive strategies should consider the influence of socioeconomic and social support determinants on screening uptake to design effective cancer screening policies.

42.....Patient Acceptability for using Point of Care tests (POCTs) to detect cancer in Primary Care

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Background: Primary care is usually the first point of contact for patients with symptoms suspicious of cancer. Reliable, rapid diagnostic cancer tests, at the 'point of care', have potential to expedite diagnosis, improve triage, avoid missed diagnoses and support timely management of patients. The study's primary aim was to explore acceptability for the use of POCTs for detecting cancer in primary care, among the United Kingdom (UK) general population. This study was part of a larger mixed-methods study.

Methods: We conducted online and telephone semi-structured interviews with 27 participants. Prior to interviews, participants viewed an educational clip on rapid tests. Acceptability related interview questions were based on a hypothetical test vignette, and were developed in accordance with the Theoretical Framework of Acceptability. Data was analysed using both inductive and deductive approaches.

Results: Preliminary results demonstrated participants found the potential use of POCTs in primary care very acceptable. Most participants believed having a rapid test for possible cancer would reduce unnecessary anxiety (for negative test) and expedite diagnosis and treatment (for positive test).

Conclusions: Initial findings indicate the use of POCTs for cancer is desirable for the UK general population and may significantly improve their diagnostic experience.

44.....CANCEPT: Cancer Primary Prevention Transdisciplinary Nutrition and Environment Research Network

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Means to accelerating the translation of actionable knowledge on cancer causes into effective prevention strategies, and improving the integration between the different components of primary prevention, are major challenges in cancer prevention. We aimed to evaluate whether the creation of a Transdisciplinary Research Network could act as an incubator and springboard for innovative primary cancer prevention grounded in cross-disciplinary research, field expertise and participatory approaches. Endorsed and funded by the French National Cancer Institute (INCa), CANCEPT aims to strengthen the continuum from understanding cancer causes through to the implementation of innovative prevention interventions from pilot to large scale. The network gathers local and national experts in cancer prevention from different sectors and a key group of internationally renowned institutions and researchers with complementary high-level expertise in cancer prevention research, with a specific focus on nutrition, lifestyle and environmental factors. Since its launching in 2022, CANCEPT has co-developed 8 interventions whose implementation is currently being tested and the first two projects are examining economic modeling. We will present the network's approach, as well as progress of the interventions jointly developed by the CANCEPT members, and discuss related barriers and opportunities.

MOLECULAR MECHANISMS IN THE TRANSITION FROM NORMALITY TO CANCER

45.....Simplified Immune Score Based on CD8+ T-Cells at the Invasive Margin Provides Comparable Prognostic Value to Immune Scores in Non-Metastatic Colorectal Cancer

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Background: Immunoscore® is a validated CRC risk stratification tool, but faces adoption hurdles due to software complexity and reimbursement. Our study simplifies immune cell scoring to CD3+ or CD8+ T-cells, aiding clinical translation in non-metastatic CRC.

Methods: Patients from southwest Germany with non-metastatic CRC were analyzed. CD3+ and CD8+ TILs were quantified in the invasive margin [IM] and tumor core [TC]. Immune score [IS] was based on TIL densities [CD3IM, CD8IM, CD3TC, CD8TC]. CART identified prognostic TILs. Two-tiered and three-tiered models were compared for survival prediction.

Results: High TIL density correlated with lower T and N stages, MSI, BRAF mutations, and right-sided tumors among 1260 patients. CART identified CD8IM as most prognostic. CD8IMHi correlated with better CSS (HR 0.58, 95% CI 0.40-0.84). The CD8IM model showed comparable performance to IS, slightly outperforming in the validation set (CPE: CD8IM 0.748, IS 0.730). Three-tiered TIL models had similar performance to IS, with CD8IM modestly outperforming the rest.

Conclusion: Focusing on CD8IM TILs offers a simplified yet effective prognostic model compared to IS in non-metastatic CRC. CD8IM could serve as a potential biomarker for adjuvant therapy benefits, advancing personalized medicine in early-stage CRC management. Further validation in larger cohorts is warranted for clinical translation.

46.....Pre-neoplastic chromosomal instability and clonal evolution in patients with Li-Fraumeni Syndrome

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Li-Fraumeni Syndrome (LFS) is an autosomal dominant cancer predisposition syndrome caused by pathogenic germline variants in the *TP53* gene. This predisposition leads to various cancers, including solid tumors and hematological malignancies. In LFS, functional inactivation of *TP53* is strongly associated with chromothripsis, a form of chromosome instability characterized by the shattering of one or few chromosomes and extensive genomic rearrangements following error-prone repair. Although such events typically hinder cell survival, some cells gain a selective advantage and expand clonally. In this study, we analyze blood from 15 LFS individuals (1,000-7,000 cells per sample) to investigate chromothripsis linked to *TP53* variants. We use high-throughput single-cell DNA, bulk DNA sequencing, and methylation analysis to identify positively selected clones. This research aims to uncover early genomic changes that might be crucial in tumor development or related to clonal hematopoiesis in LFS, potentially aiding in early cancer detection and laying the groundwork for future intervention strategies.

47.....Characterizing the effects of gut microbiome on early-onset colorectal cancer

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A global concern regarding the increasing cases of early-onset colorectal cancer (EO-CRC), defined as occurring in individuals under the age of 50, has emerged in recent years. The gut microbiome is widely recognized to play an essential role in influencing CRC pathology. However, most studies have focused on CRC occurring at a later stage (LO-CRC, individuals aged over 50), and, as a consequence, our understanding of the microbial influence on EO-CRC remains limited. To characterize the specific role of gut microbiome in EO-CRC, we analyzed fecal metagenomic data from CRC and control patients. Although no significant difference in alpha diversity was identified between EO-CRC and age-matched controls, we observed significant variations in beta diversity in EO-CRC compared to both age-matched controls and LO-CRC. Interestingly, a total of 272 species and 65 metabolic pathways were significantly different between EO-CRC and age-matched controls, acting as potential biomarkers for EO-CRC phenotype. Machine learning models using the gut microbiome were constructed to improve EO-CRC diagnosis.

48.....Sexually Transmitted Infections and Epithelial Ovarian Cancer Risk: A Meta-Analysis Predominantly Prospective Studies

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Prior studies suggest that sexually transmitted infections (STIs) like Chlamydia trachomatis (CT) and Mycoplasma genitalium (MG) may be implicated in the etiology of epithelial ovarian cancer (EOC) risk, given STI-related sequelae in the fallopian tube epithelium. EOC is a heterogeneous disease and subtype-specific associations are not well described.

We conducted a meta-analysis on the association between serologic evidence of STI history and EOC risk by histologic subtype.

Data from seven cohorts and one retrospective case-control study were analysed. All studies utilized the same laboratory methods to evaluate STI serology. Serum levels of CT marker pGP3 (considered the gold standard) was measured, along with MG, herpes simplex virus (HSV)-2, and human papilloma virus (HPV) exposure. EOC was categorized as serous or non-serous, and analysed using a random effects meta-analysis.

There was a 29% increased EOC risk with CT pGP3 seropositivity, relative to those seronegative, which was more pronounced in non-serous EOC (relative risk (RR)=1.52, 95% confidence interval (CI)=1.17-1.98)), as compared to serous (RR=1.17 (0.94-1.63)). No significant associations were observed for the other STIs.

These findings underscore potential differences in association between CT and EOC risk by subtype. Further exploration on the underlying pathways linking STIs to ovarian carcinogenesis is needed.

49.....Identification of biomarkers and microbiome-related interactions in colorectal cancer – a multi-omics approach

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Current research emphasizes the significant impact of the gut microbiota on human physiology and health, particularly in the context of CRC. However, studies on CRC have predominantly focused on single omics datasets. To deepen our understanding of complex biological mechanisms, it is essential to investigate the interactions among various omics layers, an area that remains largely unexplored. Here, we conducted a comprehensive multi-omics characterization of 77 CRC patients (Sategs I-IV) from the ColoCare Study, including shotgun metagenomics and full-length ITS sequencing, as well as untargeted metabolomics, lipidomics, and cytokine profiling from serum samples. Our findings showed no significant differences in alpha and beta diversity between cancer stages. However, several bacteria and fungal species were found significantly altered in later CRC stages. The metabolomic profiles of CRC patients across the four distinct cancer stages are well-distinguished by partial least squares discriminant analysis. Several metabolite and lipid modules significantly altered in advanced CRC were correlated with gut microbiome changes. Overall, our multi-omics approach provided putative diagnostic features distinguishing CRC stages, as well as specific molecular signatures associated with the late stages of CRC.

UNDERSTANDING AND IMPROVING THE QUALITY OF LIFE OF CANCER SURVIVORS

51.....Assessment of Long-term Survival in Childhood Cancer Patients in Eastern China

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Objective: We aimed to systematically assess and validate whether period analysis is superior to traditional cohort analysis in long-term survival of childhood cancer patients using cancer registry data from Taizhou, eastern China.

Methods: Data were obtained from all childhood cancers under 15 years of age diagnosed in nine cancer registries in Taizhou during 2004-2009. Traditional cohort and period analyses were used to estimate 5-year relative survivals (RS), respectively, and compared with observed actual survivals. Further analyses were stratified by sex, regional distribution, age at diagnosis, and cancer site. The precision and robustness of analyses were assessed by deviation value (DV) and standard error (SE).

Results: The observed actual survival of childhood cancer patients from 2009-2013 was 57.4%, with the 5-year RS estimated through cohort analysis and period analysis at 46.9% (DV: -10.5%, SE: 7.0) and 57.0% (DV: -0.4%, SE: 2.7), respectively. Further stratification by gender, region, age at diagnosis, and cancer site revealed that period analysis outperformed cohort analysis in terms of precision and robustness.

Conclusion: This study validated that period analysis provides a more accurate 5-year RS overall and stratified in children under 15 years of age compared to cohort analysis.

Keywords: Childhood cancers; Long-term survival; Period analysis; Cancer registry

52.....Towards a better screening and understanding of cancer-related fatigue: first results of the MERLIN study

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Background: Cancer-related fatigue (CRF) is one of the most common sequelae of cancer, yet it is often overlooked and undertreated. Existing guidelines recommend systematic screening for CRF, but specific recommendations on optimal timing, frequency and appropriate screening items are lacking. Therefore, the MERLIN study evaluates how such an effective screening should be designed.

Methods: MERLIN is a longitudinal observational study enrolling cancer patients at the beginning of therapy. Patients answer five screening items on CRF at close intervals. Validated fatigue instruments (EORTC QLQ-FA12, Cella criteria) and influencing factors such as age, gender or type of therapy are assessed. Fatigue during the first 12 weeks of cancer treatment is examined and the adequacy of different screening items is described.

Results: Preliminary analyses are based on the first 300 patients who completed the first 12 weeks of assessments. Screening items appear to identify fatigued and non-fatigued patients differently, with variable overlap between the screening tools. Data on the course of CRF suggest a fluctuating symptom burden early in cancer treatment.

Conclusions: Existing screening items seem to discriminate between different aspects of fatigue and lead to different categorizations of (non-)fatigued patients. A single screening time point at the beginning of treatment may not be sufficient.

53.....How Sedentary Behavior and Standing Time associated with Rest-Activity Rhythms in Colorectal Cancer Survivors

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Introduction: Disrupted diurnal rest-activity rhythms (RAR) have been associated with increased fatigue and decreased quality of life among survivors of colorectal cancer (CRC). To identify targets for improving RAR, we investigated longitudinal associations of sedentary behavior and standing with RAR parameters up to 5 years after CRC treatment.

Methods: Five repeated measurements were performed among 340 survivors of stage I-III CRC after treatment. Accelerometers, worn 24h/day for 7 days, were used to determine sedentary behavior and standing during waking, as well as RAR parameters including mesor, amplitude, circadian quotient (CQ), dichotomy index (DI), and 24h-autocorrelation (R24). Associations were analyzed using confounder-adjusted linear mixed models.

Results: More sedentary time was significantly associated with lower values of the mesor (β: -0.29; 95% CI: -0.34, -0.25), amplitude (-0.37; -0.42, -0.33), CQ (-0.37; -0.41, -0.33), DI (-0.43; -0.49, -0.36), and R24 (-0.07; -0.12, -0.02). Higher standing time was associated with an increase in mesor (0.41; 0.36, 0.47), amplitude (0.40; 0.34, 0.46), CQ (0.38; 0.32, 0.45), and DI (0.60; 0.50, 0.69), but not with R24 (-0.01; -0.01, 0.00).

Conclusion: In the years after CRC treatment, more sedentary time and less standing were longitudinally associated with lower values for RAR parameters, indicating a more disrupted RAR.

54.....The fatiguing search for online information on cancer-related fatigue: A rating on German healthcare institution websites

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Background: Cancer patients and survivors are not sufficiently informed about cancer-related fatigue (CRF). By providing reliable information, healthcare institutions could help to empower them. Information available via the websites of German healthcare institutions was portrayed.

Methods: Websites of systematically compiled certified cancer centers (n=130), non-certified hospitals (n=69), and other healthcare institutions treating cancer patients (n=84) were included. The rating tool was developed based on website quality criteria. Descriptive analyses, Kruskal-Wallis tests and post-hoc tests comparing rating sum scores between institution groups were performed.

Results: An introduction of the term CRF was offered on 21.9%, detailed information were provided on 27.9% of the websites. Information material was linked on 9.2%, treatment offers were provided on 21.6% of the websites. Comprehensive cancer centers scored significantly higher than the other institutions ($p < .001$).

Discussion: Most websites did not provide information or references to treatment offers. This goes against patients' present need for information. **Conclusion**: It is recommended that healthcare institutions improve their websites. Patients should at least find an introduction of CRF and be referred for comprehensive information to external webpages or information booklets with high-quality information.

55.....Lifestyle Behaviors before and after Colorectal Cancer Treatment and their Impact on Fatigue during and up to 12 Months after rehabilitation

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Background: As colorectal cancer (CRC) survivorship increases, so does the challenge of managing cancer-related fatigue, a prevalent condition that severely impacts survivors' ability to work and overall quality of life.

Methods: Data was derived from MIRANDA, a multicenter cohort study that enrolls adult CRC patients during a 3-week in-patient rehab within a year after primary CRC treatment. Up to date, n=353 participants provided information on lifestyle factors at the rehabilitation start (baseline) and every three months for the first year. The predictors were the HEALTHY lifestyle score and its components (diet, alcohol consumption, physical activity, BMI, and smoking status) calculated at three time points: before surgery, after surgery, and 12 months following rehabilitation. The outcome was fatigue, assessed using the Functional Assessment of Chronic Illness Therapy – Fatigue (FACIT-F-FS) scale.

Results: Participants with a higher HEALTHY lifestyle score after CRC surgery had statistically significantly lower fatigue levels. The components that contributed most to this finding were smoking and physical activity. Participants who engaged in exercise post-surgery or did not smoke before their cancer diagnosis experienced lower fatigue levels during rehabilitation.

Conclusions: Lifestyle modifications are instrumental in preventing or reducing fatigue among CRC patients.

56.....Associations of sleep characteristics with health-related quality of life in colorectal cancer patients: The ColoCare Study

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Sleep disturbance is highly prevalent among colorectal cancer (CRC) patients; however, little is known about the impact of sleep quality and chronotype on health-related quality of life (HRQoL) in CRC survivors. We included 405 CRC patients from the ColoCare Study in Heidelberg, Germany. Chronotype was assessed using the reduced Morningness–Eveningness Questionnaire, sleep latency and duration by the Pittsburgh Sleep Quality Index and HRQoL using the EORTC-QLQ-C30 questionnaire. Multivariate linear regression models examined associations between sleep, chronotype, and HRQoL pre-surgery and 6 months thereafter. Prior to surgery short sleep latency (<15 minutes) was associated with improved global health, cognitive functioning and less insomnia ($p<0.05$, all parameters), while there were no significant associations for chronotype and sleep duration. At 6 months, morning chronotype was associated with improvement of several functional scales and short sleep latency was associated with improved global health, functional scales and reduced symptom scales ($p<0.05$, all parameters). Longer sleep duration (>7 hours) was associated with improved global health, functional scales and reduced symptom scales at both time points ($p<0.05$, all parameters). To conclude, morning chronotype, short sleep latency and long sleep duration are associated with improved HRQoL in CRC survivors.

57.....Long-term associations of rest-activity rhythms with fatigue, insomnia, and quality of life in colorectal cancer survivors

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Fatigue and insomnia are common symptoms after colorectal cancer (CRC), negatively influencing health-related quality of life (HRQoL). Daily timing and patterns of physical activity and rest (diurnal rest-activity rhythms, RAR) could play a role in alleviating symptoms and improving HRQoL. We investigated longitudinal associations of RAR parameters with fatigue, insomnia, and HRQoL in CRC survivors.

In a cohort study of 289 survivors of stage I-III CRC, 5 repeated measurements were performed post-treatment. Parameters of RAR, including mesor, amplitude, acrophase, circadian quotient, dichotomy index, and 24-h autocorrelation coefficient, were operationalized using 7-day accelerometer data. Outcomes were measured by validated questionnaires. Confounder-adjusted linear mixed models were used to analyze associations of RAR parameters with outcomes from 6 weeks until 5 years post-treatment.

A higher mesor, amplitude, circadian quotient, dichotomy index, and 24-h autocorrelation were significantly associated with less fatigue and better HRQoL over time. A higher amplitude and circadian quotient were associated with lower insomnia. In the first 5 years after CRC treatment, adhering to a generally more active and consistent RAR, with a pronounced peak activity and marked difference between daytime and nighttime activity, was associated with lower fatigue and insomnia, and a better HRQoL.

58.....Validation of automatic body composition analysis in colorectal cancer patients using diagnostic abdominal CT images

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Automated body composition analysis may be useful in oncology practice to estimate prognosis and guide treatment choices. We validated an automatic method of segmenting CT images from colorectal cancer (CRC) patients, by comparing with manual segmentation.

Diagnostic abdominal L3 CT images of CRC patients (n=292) were analysed to measure cross-sectional areas and tissue densities of muscle and intra-muscular, visceral, and subcutaneous fat. Trained analysts manually segmented CT images using SliceOmatic. Automatic segmentation was performed using AutoMATiCA, an open-source tool. To assess AutoMATiCA's performance, we calculated the Dice similarity coefficient (DSC), intra-class correlation coefficients (ICC), and Bland-Altman plots with limits of agreement. Additionally, the kappa statistic was used to assess agreement between sarcopenia classifications based on the two methods.

The agreement of AutoMATiCA with manual segmentation was excellent (median DSC: 0.900-0.991; ICCs>0.95) for all segmented areas. No systematic deviations were observed in Bland-Altman plots, with overall narrow limits of agreement. There was a strong agreement (kappa = 0.96 [95% CI 0.85, 1.00]) between sarcopenia classification from the manual and automatic segmentation. AutoMATiCA accurately segments abdominal CT images from CRC patients and is an efficient automated tool for body composition analysis.

59.....Employment and quality of working life in patients with metastatic breast cancer

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Purpose: With survival rates for metastatic breast cancer (MBC) improving, research focusing on the work situation of these patients also becomes more important. The aim of the current study was to examine determinants of employment status and quality of working life (QWL) in patients with MBC.

Methods: Patients with MBC (*N* = 357) reported on their working situation and, if applicable, on QWL (*N* = 61) as part of the multinational PREFERABLE-EFFECT exercise trial.

Results: At baseline, 160 (44.8 %) participants were employed, of which 49 (30.6 %) reported having reduced their amount of work in the last three months. The most common reasons for reducing work were fatigue, cognitive issues and inability to comply with the demands imposed by work. Participants wished for more flexible working hours and less pressure to be as productive as prior to their disease. The odds of participants being employed decreased with age, pain level and line of treatment. QWL was negatively associated with fatigue and more often performing mentally strenuous tasks at work.

Conclusions: Symptom management, especially for pain and fatigue, could be important for patients with MBC ability to work. To keep patients with MBC in the workforce and to improve their QWL, employers may need to offer more flexible work arrangements and adapt their expectations based on their employees' situation and abilities.

CANCER SCREENING AND CHEMOPREVENTION

61.....Combined family history of colorectal cancer and colorectal polyp as a basis for a risk-adapted colorectal cancer prevention

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We studied colorectal cancer (CRC) risk with combined family history of CRC and polyp, considering number of first-degree relatives (FDRs) and second-degree relatives (SDRs) with CRC and polyp, youngest tumor diagnosis age, and polyp diagnosis frequency, using Swedish family-cancer data (1964-2018).

We followed 10,678,084 individuals for up to 54 years. Compared to those without family history (N=142,234), CRC risk was 2.2 times higher in those with 1 FDR with one-time polyp diagnosis and another FDR with CRC (95%CI=2.1-2.3, N=1,660; early-onset CRC, SIR=2.9, 2.5-3.4, N=152). Risk significantly increased in individuals with 1 FDR with ≥2 polyp diagnoses and another FDR with CRC (lifetime SIR=2.9, 2.7-3.1; early-onset SIR=5.0, 3.9-6.3). Similar risk was observed for those with ≥2 FDRs with one-time polyp diagnosis and another FDR with CRC (lifetime SIR=2.9, 2.4-3.5; early-onset SIR=6.2, 3.6-10.0). Individuals with ≥2 FDRs with ≥2 polyp diagnoses and another FDR with CRC had 4.6-fold lifetime risk (3.9-5.3) and 12.6-fold early-onset risk (8.5-18.1).

Our study highlights increased CRC risk, particularly early-onset CRC, in individuals with combined family history of polyp and CRC in FDRs, escalating with more polyp diagnoses in relatives, younger tumor diagnosis age, and history of polyp and CRC in multiple relatives.

62.....Colorectal cancer screening based on fecal immunochemical test and risk assessment: a population-based study including two million participants in China

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Background: The fecal immunochemical test (FIT) has been widely used in colorectal cancer (CRC) screening, yet the practical performance of fecal immunochemical test (FIT) combined with questionnaire-based risk assessment (QRA) remains undetermined.

Methods: This study was based on a population-based CRC screening in China, with 2,120,340 participants aged 50-74 years completing both FIT and QRA. Those with positive FIT or high-risk scores were recommended for colonoscopy. The colonoscopy compliance, detection rate, and colonoscopy workload according to FIT and QRA results was reported.

Results: The compliance rate of colonoscopy in the subgroup of FIT (+) and QRA (+) was 41.4%, higher than the rates in FIT (+) and QRA (-), as well as FIT (-) and QRA (+), which were 38.7% and 16.4%, respectively. The corresponding detection rates of advanced neoplasia were 18.2%, 13.2%, and 9.3%, respectively. Moreover, the required numbers of colonoscopies to detect one advanced neoplasia in the three subgroups were 5.5, 7.6, and 10.8, respectively.

Conclusion: The combination of FIT and QRA holds potential to optimize the efficiency of colonoscopy screening.

64.....Discovery and validation of novel biomarkers for colorectal neoplasia detection via plasma metabolomics

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Background: Metabolic disturbance plays a critical role in the development of colorectal cancer (CRC), yet the identification of metabolites that are useful for early detection of CRC and its precursor lesions remains elusive.

Methods: Untargeted metabolomic profiling was conducted in a two-stage case-control study, including 219 CRC cases, 164 colorectal adenoma (CRA) cases and 219 normal controls (NC) as a training set, and 91 CRC, 115 CRA and 109 NC as a validation set.

Results: Among 891 named metabolites, 239 were significantly altered in CRC vs. NC,26 in CRA vs. NC, and 88 in CRC vs. CRA within the training set. A panel of 10 metabolites, including 6 lipid species, 1 benzenoid, 1 organoheterocyclic compound, 1 organic acid derivative, and 1 organic oxygen compound, showed the optimal performance to discriminate CRC from NC (AUC = 0.810) in the validation. These metabolites also had a good discriminatory ability for early-stage CRC (0-II) (AUC = 0.797). Moreover, we identified another panel of 7 metabolites (including 5 lipid species) that showed the optimal performance to discriminate CRA from NC, with an AUC of 0.894 in the validation.

Conclusions: Our findings provide novel evidence supporting specific plasma metabolites, particularly those involved in lipid metabolism, as promising biomarkers for CRC early detection.

65.....4-IN-THE-LUNG-RUN – a multicentre European lung cancer screening trial: rational, study design, first results from Heidelberg

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Several trials have shown effective lung cancer mortality reduction through low-dose CT (LDCT) lung cancer screening. However, the most optimal strategy to determine screening interval is still to be determined. To this effect, a large-scale multi-centered implementation trial across 5 European countries was set up to determine the most optimal and personalized LDCT lung cancer screening program. To this effect, 24.000 former or current smokers will be recruited, aged 55-79 years. Participants will be randomized into annual or biannual screening. At the Heidelberg center, several recruitment methods have resulted in 1708 out of 3000 planned baseline-screened participants, with further 759 scheduled participants until summer 2024. Between 35-45% of interested citizens did not fulfil the eligibility criteria, predominantly because of insufficient smoking history (88%). Out of 1708 baseline screens, 79% were categorized as negative, 4% as suspicious positive and 16% as indeterminate with a 3-months repeat scan planned. Of the 87 screened positives, most are still under clinical work-up, 15 are false-positive and 17 are true-positive (12 men, 5 women). The true-positives presented primarily with stage I/II lung cancers (83%), were adenocarcinoma (44%) and classified as C34.1. As anticipated, a higher percentage of early stage tumours presented after LDCT baseline screening.

66.....Enhancing Lung Cancer Screening Efficacy: Socio-Demographic Insights

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Lung cancer remains a health challenge in Europe, where postal invitations are a prevalent method for reaching potential screening participants. This study focuses on Mannheim, chosen for its diverse population and the availability of detailed region-wise data on social status, as part of two screening programs,"LUSI" and "4ITLR."Our analysis highlights significant disparities in the delivery of invitations, particularly in socio-economically deprived areas, which also report higher cancer incidences and lower reach.To address these inequities, we propose specific outreach strategies: enhanced tracking and community engagement in areas with high non-delivery rates to ensure invitations reach their intended recipients; increased health awareness and accessible screening for individuals who receive but don't respond to invitations; and strengthened follow-up protocols for attendees to maintain engagement. Additionally, the study explores the use of social network invitations among participants to assess their effectiveness compared to postal methods. This approach integrates the Theory of Planned Behavior, examining behavioral influences such as attitudes toward health and perceived screening barriers. By tailoring strategies to the unique needs of Mannheim's demographic groups and specific regions, these initiatives aim to improve participation rates, and address disparities in screening.

69.....Lung cancer and recognition as an occupational disease in a cohort of employees with a history of asbestos exposure

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Background: The German Social Accident Insurance (DGUV) offers lung cancer screening by means of annual low-dose CT for persons with a 10-year history of occupational asbestos exposure (OAE) and onset before 1985, age ≥55 years and a smoking history of ≥30 pack years (PY). The objective of this analysis is to determine whether cases of lung cancer that are recognised as an occupational disease (OD) no. 4104 may be identified in advance.

Methods: All cases from the cohort with notification of a suspected OD no. 4104 were analysed using routine data (years 2014 to 2022) from the DGUV. Age, smoking history, and duration of OAE were investigated as determinants of the recognition of lung cancer as an OD.

Results: In 609 persons an OD no. 4104 was notified. Lung cancer was confirmed in 377 cases, 189 of which were recognised as OD no. 4104. Cases with recognised OD no. 4104 were older (mean 71.7 vs. 68.7 years), had a comparable smoking history (mean 46.1 vs. 45.6 pack years), were more often ex-smokers (55.6% vs. 37.2%) and had a longer OAE (mean 23.1 vs. 19.8 years). Hardly any lung cancers were detected at the lower age limit of 55 years, but 8.4% vs. 10.4% occurred at the lower tobacco consumption limit of 30 PY.

Discussion: Based on available routine data, ex-ante identification of cases with lung cancer OD no. 4104 does not seem possible. Individual case review is therefore essential.

70.....PRSONAL – Population-based Randomized Study Of a Novel breast cancer risk ALgorithm and stratified screening

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Purpose: To measure short-term safety and efficacy of personalized vs. standard biennial mammography screening among 50-67-year aged women.

Method: RCT of 962 consenting women aged 50-67 years attending regular screening mammography. At recruitment, women fill in questionnaires on personal risk factor information, quality of life, anxiety and breast cancer worry. Height, weight and BIRADS density are also measured. Women in the intervention group have blood sampled for measuring polygenic risk score.

Women in the control group continue with standard biennial mammography, while women in the intervention arm will be categorized based on their absolute 10-year breast cancer risk using the BOADICEA model. Risk categorization will be communicated on-line together with a suggested future screening program for each group: low risk (mammography every 4th year), intermediate risk (mammography every 2nd year), elevated risk (mammography every year), and high risk (MR mammography every year).

Outcomes: Primary outcome is the acceptance of prolonged screening interval among low-risk women in the intervention group. Secondary outcomes consist of anxiety, breast cancer worry and quality of life. Tertiary outcomes include health care staff time spent on consultations after communication and suggested screening program.

Status: Recruitment began Feb. 1st 2024 and by May 7th 400 women had been randomized.

71.....An interrupted time-series analysis of colorectal cancer incidence in the pandemic periods

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Purpose: In this study, we assessed the impact of the COVID-19 pandemic on colorectal cancer (CRC) incidence in Bavaria in the pandemic and post-pandemic period in middle-aged men and women.

Methods: We modelled the monthly age-standardised incidence rates (ASIR) in the pre-pandemic (01/2011 to 02/2020) and pandemic (03/2020 to 12/2021) period and predicted ASIR for the post-pandemic period (01/2022 to 12/2022) using an interrupted time-series analysis, stratified by sex, age and cancer stage. We measured the gap between estimated and observed ASIR for the pandemic period.

Results: Data of 55,643 malignant cases of CRC in Bavaria between 2011 and 2021 were analysed. For early stage CRC in the pandemic period, a gap of -17.8% [95% CI -22.8%; -12.2%] occurred, which decreased to -12.9% [95% CI -20.6%; -5.3%] in 2022. Advanced stage CRC showed a reduction of -7.7% [95% CI -16.0%; 2.4%], subsequently declining to -5.7% [95% CI -14.4%; 3.0%]. Stratified by sex and age, we observed a gap of -6.0%; [95% CI -13.2%; 2.6%] for women aged 50 – 69 years, almost dissipating to -1.9% [95% CI -11.9%; 8.2%] in 2022. The reduction found for men in this age group reached -13.2%; [95% CI -18.3%; -7.3%], hardly changing to -12.7% [95% CI -20.5%; -4.9%] in 2022.

Conclusion: For men aged 50 – 69 years, CRC ASIR hardly recovered in the post-pandemic period. Preventive efforts may focus on this population group.

72.....Summary of algorithm and pilot implementation for PRAISE-U

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Intro: In 2023, the PRostate cancer Awareness and Initiative for Screening in the European Union (PRAISE-U) project was launched, investigating the feasibility of prostate cancer (PCa) screening within Europe (EU) (https://uroweb.org/praise-u).

Methods: Based on country-specific requirements we developed 5 risk-based screening algorithms.

Results: 5 sites will invite men aged 50-69 years: 8,000 in Ireland (IRE), 12,000 (GAL) and 5,620 (MAN) in Spain, 10,000 in Lithuania (LIT) and 30,000 in Poland (POL) (fig 1.). Invitation letters are sent in POL, IRE and MAN, while e-mail and/or SMS are used in LIT and GAL. A PSA home test is used in IRE, in the other sites testing is done in the lab or at GP. In MAN, no DRE is performed prior to MRI, risk stratification will be based on PSA-D. Other sites will use the ERSPC Rotterdam RC (www.prostatecancer-riskcalculator.com). LIT, GAL, and IRE use mpMRI and 2 pilots (POL and MAN) will use bpMRI before biopsy (PBx). GAL, MAN and IRE will do cognitive PBx , the other sites will use software fusion PBx. The PBx are transrectal (MAN, POL), transperineal (GAL) or both (LIT, IRE). The primary endpoint is detection of clinically significant PCa (ISUP≥2), while compliance is also one of the spearheads in the analyses.

Conclusion: PRAISE-U will provide in-depth knowledge essential for successful implementation of population based PCa screening within the EU.

74.....Prospective interventional study on Tobacco Awareness, Cessation and Oral Screening (TACOS) for factory workers in BSL Limited, Bhilwara (Rajasthan, India)

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India has a high incidence of tobacco use and related cancers. Early detection of pre-cancerous and cancerous oral lesions is crucial to reduce morbidity and mortality. Oral health screening is challenging in India and LMICs. Mobile phone-based screening by community health workers (CHWs) is valuable. This study was conducted at a BSL factory in Rajasthan with 3,400 workers. A mobile phone app was used to capture oral cavity images.

Aims:(i) To assess oral health and identify precancerous or early cancerous lesions using mHealth technology(ii)To evaluate the impact of tobacco cessation activities.

Methods: Awareness activities on tobacco hazards & early cancer signs were conducted. 5 factory workers were trained on-site to examine oral cavities and take pictures, stored in cloud space. An expert team assessed these images. Periodic clinical evaluations by ocologist were arranged.

Results: Over 6 months, 239 tobacco users were screened. Oral lesions were found in 122(51.2%). Only 50 attended a free clinical evaluation camp. Eight had suspected lesions requiring biopsy; only two agreed, with negative histopathology results for cancer. The remaining six refused due to fear. Tobacco cessation sessions were conducted. The project is ongoing.

Conclusions: mHealth-based oral health screening is useful at community level. CHWs can effectively perform large-scale screening in high-risk populations.

75.....DNA methylation-based biological aging trajectories in incident cancer

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Background: Previous studies have shown that three DNA methylation (DNAm) based algorithms of aging, PhenoAge, GrimAge, GrimAge2, and mortality risk score (MRscore), to be strong predictors of mortality and aging related outcomes. We aimed to investigate if and to what extent these algorithms predict cancer.

Methods: In a population-based longitudinal cohort (n = 894) from Germany, DNA methylation in whole blood was measured using the EPIC. PhenoAge, GrimAge, GrimAge2, and MRscore, were calculated. Hazard ratios were calculated to assess associations of the four DNAm algorithms with total cancer risk.

Results: A total of 174 malignant tumors were observed during 17 years of follow-up and 48 diagnosed before baseline. Whether diagnosed before baseline or during the follow-up, cancer caused significant older of biological age. Twice measurements at baseline and the 8-year follow-up both have good predictive value for cancer risk, with the second measurement showing better predictive effectiveness. A faster average rate of changing in the interval indicated a higher cancer risk. Cancer also caused to persistent acceleration of biologically aging.

Conclusion: The DNAm algorithm have potential to contribute to pan-cancer risk prediction. For individuals with family history of cancer, the monitoring intervals should be shortened to facilitate early detection and treatment of cancer.

76.....Assessing surveillance bias in cancer using epidemiological signatures

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Introduction: Surveillance bias occurs when variations in cancer incidence are the result of changes in screening or diagnostic practices rather than increases in the true occurrence of cancer. This bias can result in the wrong assessment of the true burden of cancer and can be apprehended using epidemiological signatures.

Methods: We assessed surveillance bias using epidemiological signatures of melanoma and lung cancer in Switzerland, using data from 1981 to 2020 retrieved from the National Institute for Cancer Epidemiology and Registration. These signatures consist of age-standardized incidence and mortality trends.

Results: Melanoma exhibits a signature indicating surveillance bias: increasing incidence (likely attributable to a high proportion of overdiagnosed cases due to frequent skin examinations), which was not followed by an increasing mortality. Lung cancer exhibits a signature less influenced by surveillance bias, with changes in incidence and mortality reflecting changes in the prevalence of risk factors rather than screening or diagnostic practices.

Conclusions: Accounting for surveillance bias is particularly important for assessing the true burden of cancer and for accurately communicating cancer information to the population and decision-makers. Epidemiological signatures help in the assessment of this bias, easing the understanding of cancer surveillance data.

77.....Identification of extracellular vesicle-derived protein biomarkers for the diagnosis and prognosis of colorectal cancer

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Throughout the last decade, proteins derived by extracellular vesicles (EVs) have been identified as a potential non-invasive diagnostic marker for cancer.

We aimed to identify EV-derived protein biomarkers for predicting survival in colorectal cancer (CRC) patients. Differential protein expression of isolated EVs from 7 normal and 6 primary CRC tissues has been evaluated using Mass Spectrometry and was confirmed in serum-derived EVs from 13 CRC patients. Validation was conducted on serum EVs from 582 primary and liver-metastasized CRC patients from the ColoCare Study and the Biobanks at the Surgery Department (Heidelberg and Dresden University Hospitals). The expression of the differential candidate proteins was evaluated by ELISA. Log Rank tests were applied for survival analyses.

Intersectional analysis with serum-based EVs revealed differential expression of three candidate proteins: FBLN1 was significantly higher expressed in tumor compared to normal tissue, whereas SERPING1 and SERPINA4 expression was significantly lower (fold change>2, $p<0.05$, all parameters). While higher levels of FBLN1 in serum EVs were associated with worse survival, higher expression of SERPING1 and SERPINA4 was associated with improved survival ($p<0.05$).

Our findings suggest that EV-derived proteins FBLN1, SERPING1 and SERPINA4 may serve as candidate diagnostic and prognostic biomarkers for CRC.

78.....Modeling the Long-Term Benefits and Cost-Effectiveness of Nationwide Colorectal Cancer Screening Programs in China from 2020 to 2060

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Background: Evidence on long-term benefits and cost-effectiveness of colorectal cancer (CRC) screening strategies in China is limited. This modelling study evaluates various CRC screening strategies in China from 2020-2060.

Methods: Using a microsimulation model with Chinese data, we evaluated: no screening, colonoscopy every 10 years, biennial fecal immunochemical testing (FIT), and a roll-out FIT strategy for ages 40–74, with 5%-100% coverage rates. Single-cohort analysis estimated relative cost-effectiveness. Multiple-cohort analysis projected nationwide long-term benefits and cost-effectiveness from 2020-2060.

Findings: All strategies reduced CRC burden vs no screening in single-cohort analysis, with colonoscopy outperforming FIT-based strategies. Nationwide from 2020-2060 at 5% coverage, colonoscopy, biennial FIT and roll-out FIT averted 1.2, 0.4, and 0.4 million incident CRCs and 0.3, 0.2, and 0.1 million deaths vs no screening. At full coverage, colonoscopy achieved largest reductions but required most resources. Biennial FIT and roll-out FIT were slightly less effective but significantly reduced colonoscopy needs and overall cost.

Interpretation: Nationwide screening would effectively reduce CRC burden in China. Biennial FIT and roll-out FIT could prevent cases and deaths with considerably fewer resources than colonoscopy screening. Efforts should increase screening coverage.

79.....Risk of Metachronous Advanced Neoplasia After Colonoscopy in Patients with Different Index Findings

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Introduction: Patients undergoing colonoscopy are at risk of developing metachronous advanced neoplasia (AN). We explored risk factors of metachronous AN and refines risk stratification based on different index findings.

Methods: This retrospective cohort study included patients undergoing multiple colonoscopies in China in 2012-2023. Cox regression estimated the risk of metachronous AN. Cumulative hazard was determined using Kaplan-Meier estimation.

Results: A total of 3,595 patients were included. In the index nonadvanced adenoma (NAA) group, covariate-adjusted Cox regression showed proximal adenomas, adenomas ≥6 mm, and ≥3 adenomas were associated with increased risk of metachronous AN. In the group with non-significant findings, age ≥50 years, family history of colorectal cancer, and male sex were risk factors. Survival analysis revealed that patients with these risk factors reached reference risk for developing metachronous AN much earlier. For instance, the risk of developing metachronous AN among NAA patients without risk factors was low and stable after at least 5 years, but similar risk was reached after 2 years for NAA patients with one risk factor and after 1 year for NAA patients with ≥2 risk factors.

Discussion: The identified risk factors could contribute to personal risk stratification for patients at high risk of developing metachronous AN.

80.....Cross-cohort analysis reveals core gut microbial species and well-validated microbial scores for colorectal cancer

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Background: Microbiome-wide association studies showed links between colorectal cancer (CRC) and gut microbiota. We aimed to determine CRC-related gut microbial species based on cross-regional, cross-population, and cross-cohort metagenomic datasets, and elucidate its application value in CRC risk assessment.

Methods: We conducted a meta-analysis of in-house and publicly available metagenomics datasets to identify gut microbial species associated with CRC across different cohorts. Based on differential species sets, we constructed the microbial risk score (MRS) using α-diversity of the sub-community and weighted/unweighted additive methods. Cohort-to-cohort training and validation were performed to demonstrate the transferability.

Results: We found that MRS constructed by α-diversity of core species performed better than those constructed using additive methods. Six species, including Parvimonas micra, Clostridium symbiosum, Peptostreptococcus stomatis, Bacteroides fragilis, Gemella morbillorum, and Fusobacterium nucleatum, were included in MRSα constructed by half or more of the cohorts. The AUC of MRS constructed reached 0.65 or higher across eight cohorts, with the highest reaching 0.821.

Conclusions: We identified six CRC-related species across regions, populations, and cohorts. MRSα was highlighted for its performance, simplicity of calculation and high interpretability.

82.....Participation and Yield in Multiple Rounds of Fecal Immunochemical Test (FIT) based Colorectal Cancer Screening: A Systematic Review and Meta-Analysis

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Introduction: We aimed to assess the trends in participation and colorectal cancer detection (CRC) under different screening intervals in multi-round CRC screening based on fecal immunochemical test (FIT).

Methods: PubMed, Embase and Cochrane were retrieved up to April 16, 2024 and we synthesized participation and CRC detection rates for each screening round, along with 95% confidence intervals.

Results: 19 studies involving 2,296,071 individuals were included. As screening rounds increased, participation exhibited a gradual consistent increase, reaching 78.45% and 74.97% for annual and biennial screening. For annual screening, the cumulative detection rates for 3 rounds were 1.84% (95% CI: 0.98–3.49%), 2.64% (95% CI: 1.37–5.08%), and 2.49% (95% CI: 2.27–2.71%), respectively. For biennial screening, the cumulative detection rates for 4 rounds were 2.46% (95% CI: 1.75–3.18%), 3.72% (95% CI: 2.66–4.78%), 4.28% (95% CI: 3.41–5.14%), and 5.10% (95% CI: 3.28–7.29%). Notably, the per-round detection rate of colorectal neoplasms declined yet.

Conclusion: In population-based CRC screening, the participation exhibited a slow upward trend for both screening strategies, but incremental benefits in CRC detection gradually diminished. Tailored strategies, such as extending intervals for individuals with multiple negative FIT results, might optimize effectiveness and cost-efficiency in CRC screening.

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