Director's Report

Dr Elisabete Weiderpass, Director

Scientific Council, 61st Session (remote)
12-14 February 2025

International Agency for Research on Cancer
World Health Organization

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Introduction: a few updates

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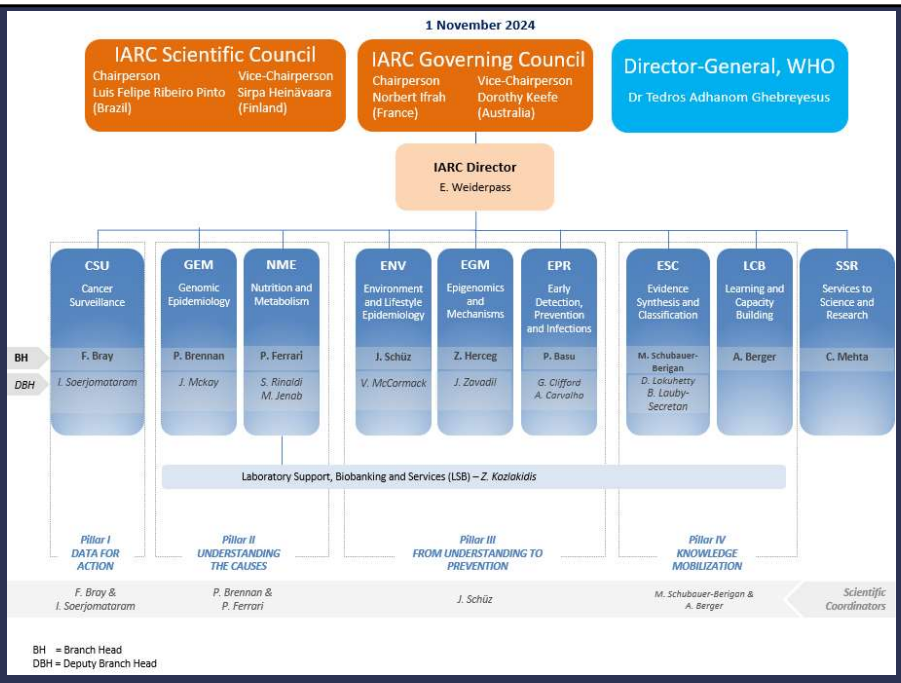
Organigram as of 1 November 2024



The slide shows IARC organigram as of 1 November 2024. Charu Mehta was appointed Director of Administration and Finance (DAF) in October 2024.

The four pillars reflect IARC's fundamental activities:

Pillar 1: data for action

Pillar 2: understanding the causes

Pillar 3: from understanding to prevention

Pillar 4: knowledge mobilization

IARC at the World Health Assembly

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IARC was represented at the Seventy-seventh World Health Assembly, which took place in Geneva, Switzerland, from 27 May to 1 June 2024.

Several IARC scientists, including IARC Director Dr Elisabete Weiderpass, presented the Agency's work during different side events to the World Health Assembly, and IARC personnel met with colleagues and other parties interested in cancer prevention at the IARC stand on Monday 27 May.

IARC at the World Cancer Congress

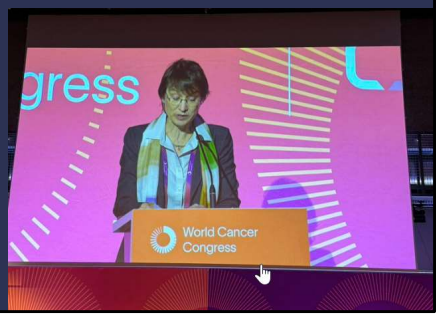
Extensive social media activities (34 posts) highlighting IARC's presence & research at WCC

Press conference with IARC Scientists at UICC

Media coverage

Web page dedicated to event

World Cancer Congress
Geneva, Switzerland
17–19 Sept 2024



IARC was well represented at the World Cancer Congress, which took place on 17–19 September 2024 in Geneva, Switzerland. More than a dozen IARC scientists presented their research on a range of topics in the field of cancer prevention.

In addition to a scientific session sponsored by IARC entitled "Cancer prevention that works: reducing cancer burden faster through multisectoral collaborations" on 18 September, IARC researchers led and participated in sessions on issues such as building resilient cancer systems, early diagnosis, cancer control in low- and middle-income countries, multi-cancer blood tests, and the cost of cancer.

International Agency for Research on Cancer

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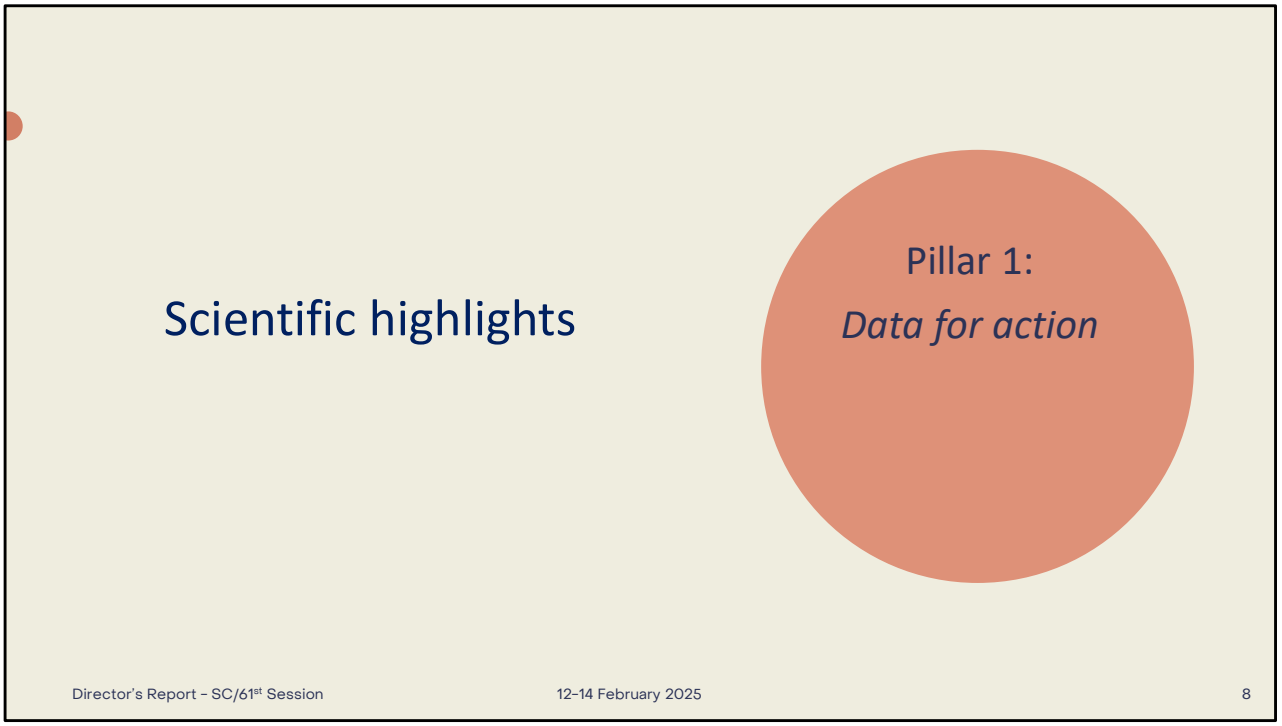
1. Scientific highlights

Director's Report



The following slides present some scientific highlights for **Pillar 1**, which includes the **Cancer Surveillance (CSU) Branch**.

Global Initiative for Cancer Registry Development (GICR) - translating knowledge to action: the GICR*Net*

The GICR*Net*: a cohort of regional leaders delivering change in cancer registration as teachers, technical experts and mentors

Two GICR*Net* workshops were held in October 2024 to support co-developing educational material for technical assistance in relation to:

Cancer registry software, CanReg5

Childhood cancer, ChildGICR

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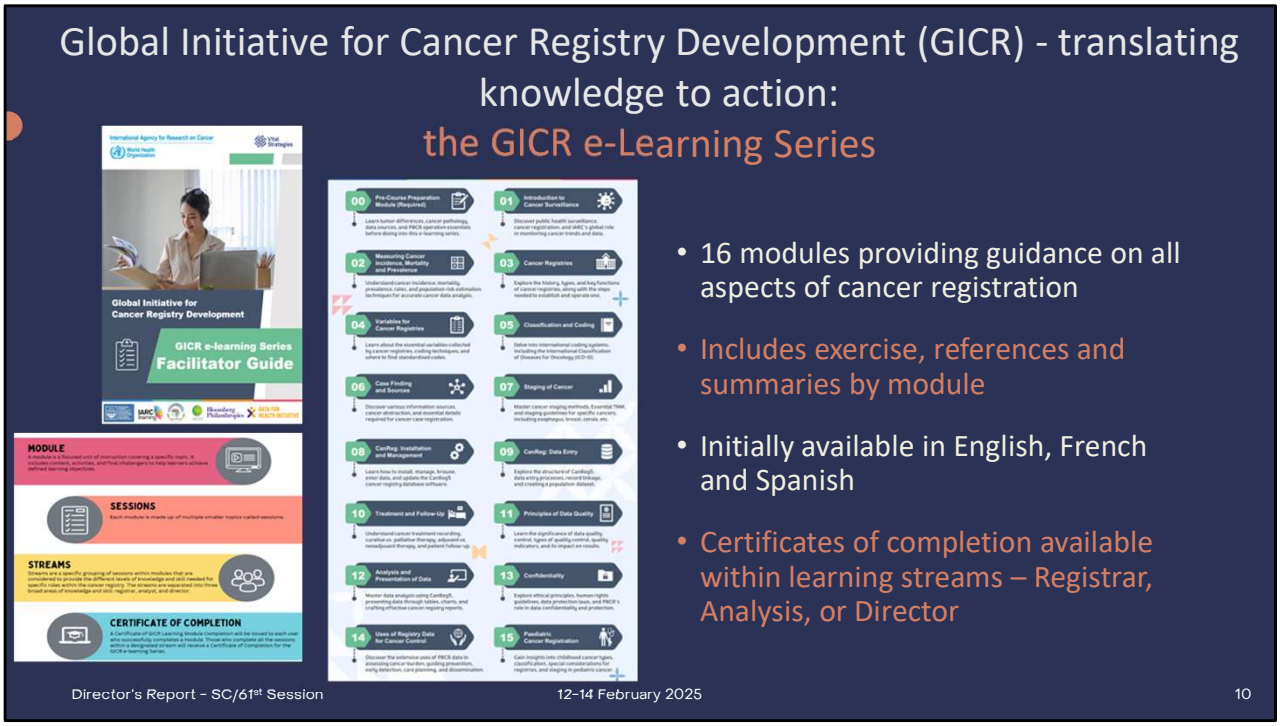
CSU

IARC has been working with cancer registries worldwide for close to three-quarters of a century, providing standards for the collection and reporting of cancer incidence and survival internationally. In countries undergoing social and economic transition, the IARC-led Global Initiative for Cancer Registry Development (GICR) established six IARC Regional Hubs to serve as a first point of contact for countries seeking assistance in cancer registration and following the addition of 13 IARC-GICR Collaborating Centres has delivered technical assistance, education and capacity building to complement the normative guidance from WHO in national cancer control programmes.

To provide further support, the GICRNet was created to launch a network of regional trainers selected from the IARC Hub regions that were tasked with co-producing educational material on selected topics and disseminating these through interactions with registry staff, such as courses and directed support. A critical aspect is continued engagement with trainers regularly so that there is a true network that can be called for assistance.

Two GICRNet workshops were held in November of last year focusing on developing a network of trainers worldwide. The workshops are held as a modified version of train-the-trainer, where instead of one expert training others, participants collectively develop the needed educational resources to train others in their respective regions.

The first workshop was held in collaboration with Bloomberg Philanthropies and Vital Strategies, and targeted for trainers with specific expertise in CanReg5, IARC's open-source software used by registries for collection, validation, analysis and dissemination of cancer data. Thirty-five new trainers were added to the GICRNet for CanReg5.



CSU

The GICR e-Learning Series, launched on World Cancer Day on 4 February, comprises 16 comprehensive training modules providing foundational knowledge and skills development in the principles and practices of cancer registration. It is aimed at anyone who is considering starting or has started a cancer registry career, from those who are newly hired to staff members wishing to refresh their knowledge – registrars, analysts, data managers, and directors.

The GICR e-Learning Series provides guidance on all aspects of cancer registry practices – an introduction to cancer surveillance, registry operations, data analysis and dissemination for cancer control impact. Each module is aligned with the international standards of cancer registration that are recommended by the International Association of Cancer Registries (IACR). Modules also correspond to training material used by the GICR.

To provide recognition for those that acquire the necessary knowledge in cancer

registration through the completion of all the modules and successfully pass a test, the designation as a Certified Global Tumor Registrar will be given together with a certificate.

The GICRNet Regional Trainers are asked to provide additional learning support as facilitators for users of the Series. Learners may wish to ask for assistance in understanding certain concepts or discuss how they can be applied in their region. To help effectively assist learners, GICRNet trainers are encouraged to become familiar with modules relevant to their expertise area.

Facilitator Guide Purpose

This guide is designed for GICR partners, particularly GICRNet Regional trainers, who are asked to support cancer registries within their regions. It is designed specifically for those designated by IARC to act as a facilitator in GICR e-Learning Series. The goal is to familiarize facilitators with standardized teaching materials and resources aimed at enhancing support for cancer registries within regions, equipping them with the tools and knowledge to effectively lead sessions and support participants in achieving their learning objectives.

45th IACR Scientific Conference, Beijing, China

- Co-hosted by the National Cancer Center and Cancer Hospital, Chinese Academy of Medical Sciences in November 2024
- Over 500 participants from China and around the world met in Beijing to attend workshops and a scientific meeting
- Keynote and scientific talks from 25 countries

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CSU

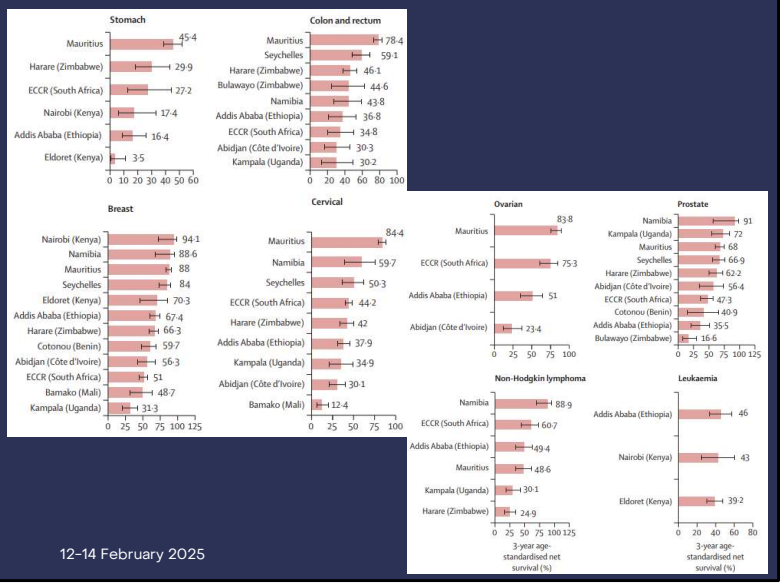
The International Association of Cancer Registries (IACR) and IARC have been linked from the early days of cancer registration and in official relations for 50 years, since 1974. The Branch provides the permanent Executive Secretary to the IACR, the professional umbrella organisation for all population-based cancer registries worldwide. As well as facilitating the use of international standards and tools for cancer registration, the Secretariat at IARC arranges the annual IACR scientific conference for its members.

In November last year, the IACR Scientific Conference was held in Beijing, China and co-hosted by the National Cancer Center and Cancer Hospital, Chinese Academy of Medical Sciences. Over 500 participants from China and around the world met in Beijing to attend workshops, keynote and hear scientific talks from 25 countries.

A highlight was to hear of the expansive programme of cancer registry development alongside national cancer control from Prof He, Director of the National Cancer Center as well as Dr Wei, who directs the National Cancer Registry Office. The participants learned that the National Central Cancer Registry now has over 2800 cancer registries covering close to 99% of the districts and countries of China, an extraordinary achievement. As ever, it was is as much as a social as a scientific meeting, and we would like to sincerely thank our Chinese hosts for their extraordinary commitment and generous support to the IACR community in hosting the 45th meeting of the Association.

High Quality Cancer Survival Estimates in Sub-Saharan Africa

- Collaboration with the AFrican Cancer Registry Network (AFCRN) – 1st analyses of cancer specific survival in 11 countries
- Survivals were low, for half of the cancer types, less than 50% of patients survived 3 years post diagnosis, e.g.
  - Cervical cancer: 52.3%
  - Liver cancer: 18.1%, or
  - Lung cancer 32.4%



Joko-Fru et al, *Lancet GH* 2024

CSU

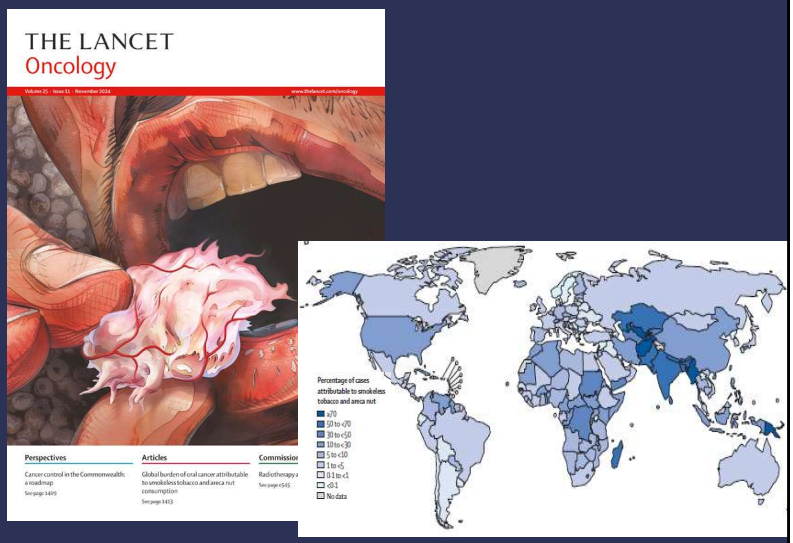
Even today, limited information is available as to how advances in early detection and screening have translated to population-level cancer survival benefits for countries in sub-Saharan Africa. This is an in-depth analysis of cancer survival in sub-Saharan Africa using data from 13 population-based cancer registries to evaluate survival outcomes for 18 cancers in sub-Saharan Africa, focusing on disparities in survival. The study is performed alongside capacity supports for registries and countries to allow regular, future, collection and data analysis in their own setting.

Key findings of the study showed that survival for preventable cancers like cervical and lung cancer remains alarmingly low, with fewer than half of the patients surviving three years for many cancer types. Survival varied by gender and cancer type but not consistently by country-level Human Development Index. They emphasize the urgent need to enhance **cancer prevention**, diagnosis, and care in the region, providing crucial data for policy and advocacy efforts.

Global burden of oral cancer in 2022 attributable to smokeless tobacco and areca nut consumption

- Collaboration with the IARC Cancer Prevention Handbook, WHO, and academic experts
- **One in three** oral cancer cases (120 200 cases in 2022) were linked to smokeless tobacco or areca nut consumption
- **90.2% of cases** occurring in low- and middle-income countries.

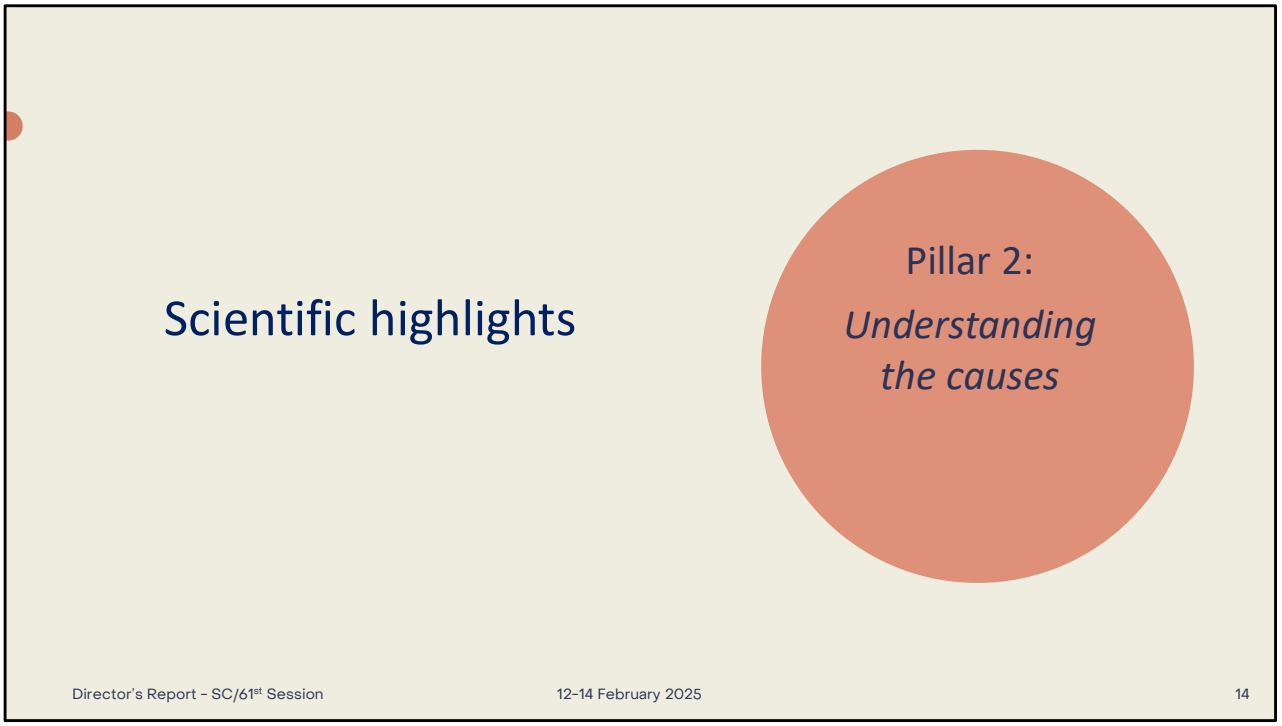
Rumgay et al, *Lancet Oncology* 2024



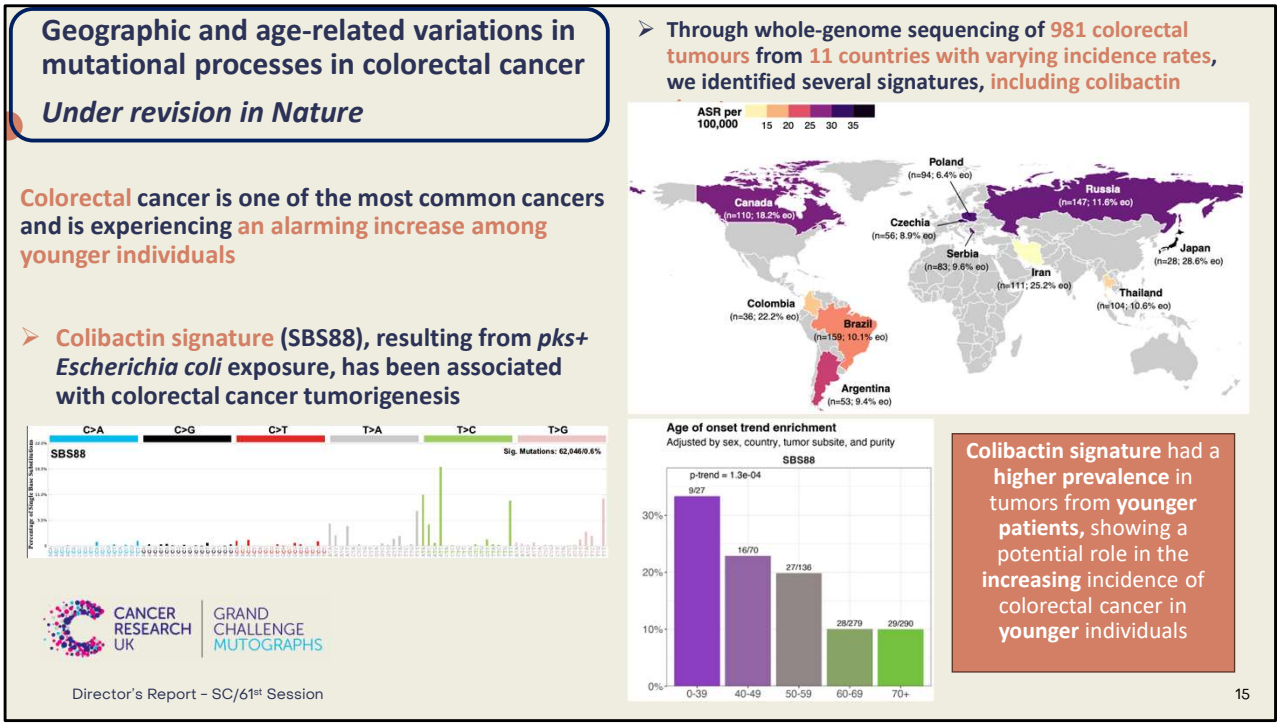
CSU

Consuming smokeless tobacco or products containing areca nut is linked to numerous diseases including oral cancer. Previous studies have estimated the impact of consuming smokeless tobacco and areca nut on deaths but not on the impact on new cancer diagnoses which is important to monitor prevention actions. There were also lacking estimates on impact of the different types of smokeless tobacco products and areca nut consumptions. In this work IARC and collaborators provided a more complete picture of the burden of these risk factors on health care and the potential impact of primary prevention.

This work highlights the significant burden of oral cancer attributable to smokeless tobacco and areca nut consumption, accounting for nearly one in three cases globally. The analysis also showed that 90% of these cases occur in low- and middle-income countries. Specific products were responsible for up to 84% of cases in high-burden countries like India and Bangladesh. Importantly, while smokeless tobacco control progress has stalled, areca nut lacks global regulatory frameworks. The findings underscore the urgent need to strengthen control measures for both products and develop global policies for areca nut prevention.



The following slides present some scientific highlights for **Pillar 2 – understanding the causes**, that includes the **Genomic Epidemiology (GEM) Branch**, the **Nutrition and Metabolism (NME) Branch**, and the **Laboratory support, Biobanking and services (LSB)**.



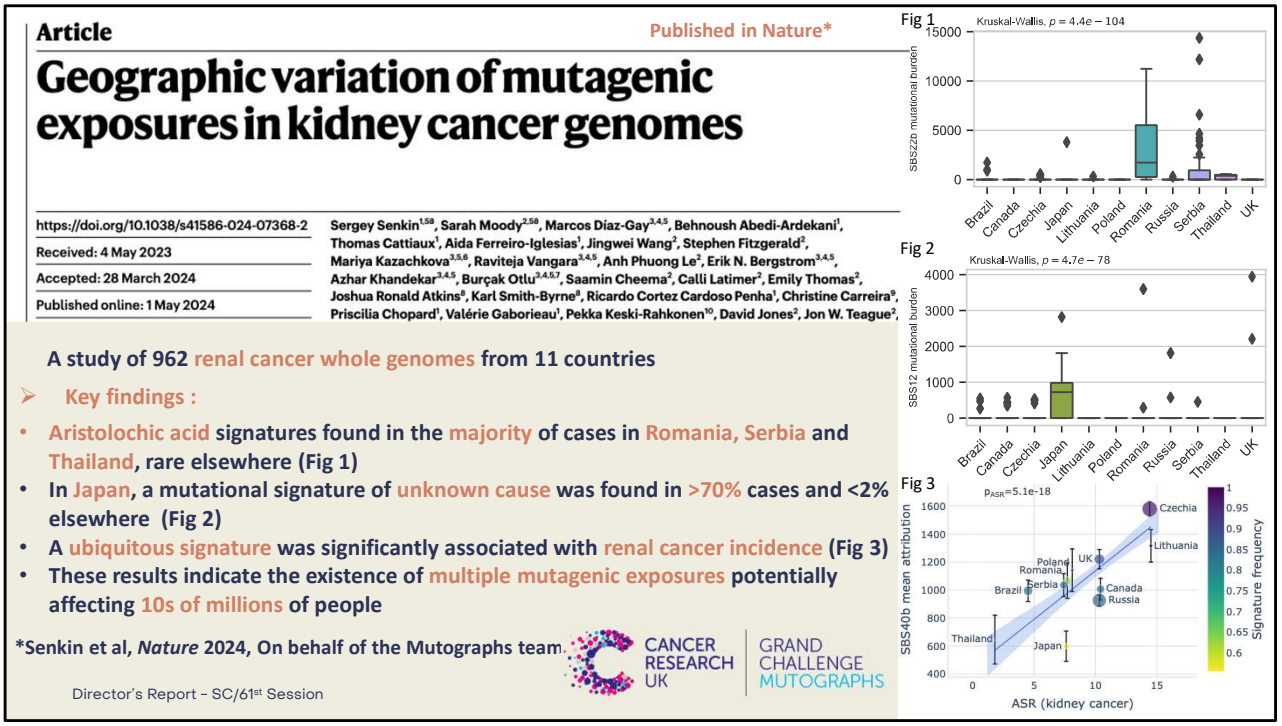
GEM

Mutographs is a Cancer Grand Challenges project that aims to understand the causes of five different cancer types across five continents by generating mutational signature profiles.

Through whole-genome sequencing of 981 colorectal tumours from 11 countries with varying incidence rates, GEM identified several signatures, including colibactin signature. Colibactin signature (SBS88), resulting from *pks+ Escherichia coli* exposure, has been associated with colorectal cancer tumorigenesis.

Colibactin signature had a higher prevalence in tumors from younger patients, showing a potential role in the increasing incidence of colorectal cancer in younger individuals.

This study is under revision in Nature.



GEM

The renal cancer Mutographs **study has been published in Nature**.

A study of 962 renal cancer whole genomes from 11 countries has revealed three main findings:

- A DNA signature for Aristolochic acid was present in most cases from Romania, Serbia and Thailand, and largely absent elsewhere, implying widespread exposure in the region.
- In Japan, a mutational signature of unknown cause was found in more than 70% cases and absent elsewhere.
- A third mutational signature was found to predominantly occur in high incidence countries of Czech Republic and Lithuania.

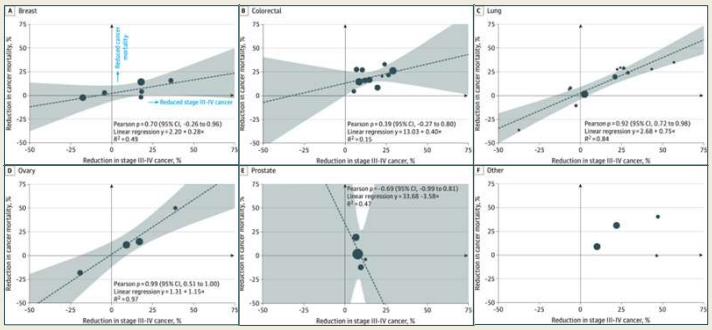
These results indicate that exposure to both known or unknown potent mutagens are widespread, affecting many millions of people, and can be detected by sequencing renal tissue.

Cancer screening trials for novel blood tests: can stage endpoints be good proxies for mortality?

JAMA | Original Investigation

Cancer Stage Compared With Mortality as End Points in Randomized Clinical Trials of Cancer Screening
A Systematic Review and Meta-Analysis

Xiaoshuang Feng, PhD; Hana Zahed, PhD; Justina Onwuka, PhD; Matthew E. J. Callister, PhD; Mattias Johansson, PhD; Ruth Etzioni, PhD; Hilary A. Robbins, PhD, MHS, MSPH



In randomized trials of multi-cancer screening tests, a test's ability to reduce late-stage cancers **may not directly inform its ability to reduce cancer mortality**, due to variation by cancer type.

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Feng,* Zahed,* Onwuka,* Callister, Johansson, Etzioni, and Robbins, *JAMA* 2024

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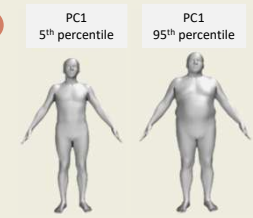
GEM

A new study led by GEM and published in the Journal of the American Medical Association assesses whether the incidence of late-stage cancer could be a suitable alternative end-point in randomized clinical trials of cancer screening, in place of cancer-specific mortality, the gold-standard end-point.

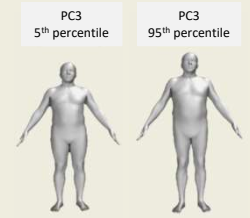
Based on 41 randomized clinical trials evaluating the effectiveness of screening tests, the findings suggest that the rate of late-stage cancers may be a suitable alternative metric to cancer deaths for some types of cancer but not for others.

GEM found that reductions in the rate of late-stage diagnoses for lung and ovarian cancers led to similar reductions in cancer deaths. For breast cancer, the reduction in deaths was smaller than the reduction in the incidence of late-stage cancers, and for colorectal and prostate cancers, the relationship between the two metrics was weak.

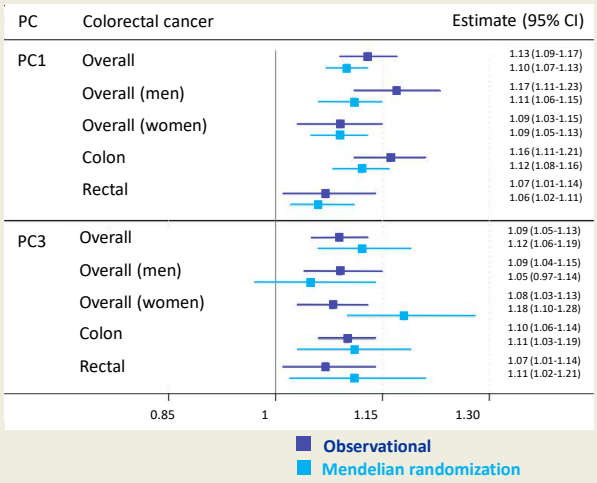
Body shape phenotypes and colorectal cancer risk



PC1: Generally obese phenotype



PC3: Tall, centrally obese phenotype



Peruchet-Noray L et al. *Science Advances* 2024

Two body shape types reflecting general adiposity (PC1) and central adiposity (PC3) were positively associated with colorectal cancer risk in:

- **Observational** study (UKB)
- **Mendelian randomization** analyses

Associations of **generally obese (PC1)** and a **centrally obese (PC3) body shape** and colorectal cancer risk were mainly driven by genetic variants enriched in the **brain** and **adipose tissue**, respectively

NME

Body shape phenotypes reflecting adiposity subtypes were derived with principal components analysis using body mass index, height, weight, waist-to-hip ratio, and waist and hip circumference.

A generally obese (PC1) and a tall, centrally obese (PC3) body shape, as you can see on the left-hand side of the slide, were positively associated with CRC risk in observational analyses in UK Biobank.

In a genome-wide association study in UK Biobank, over 3,000 genetic variants were related to these body shapes. A Mendelian randomization analysis confirmed positive associations of PC1 and PC3 with colorectal cancer risk in an genetic consortium including over 52,000 colorectal cancer cases.

Brain tissue–specific genetic instruments, mapped to PC1 through enrichment analysis, was the main driver of the relationship between PC1 and CRC, while the relationship between PC3 and CRC was predominantly driven by adipose tissue–specific genetic instruments. This study suggests distinct putative causal pathways between adiposity subtypes and CRC.

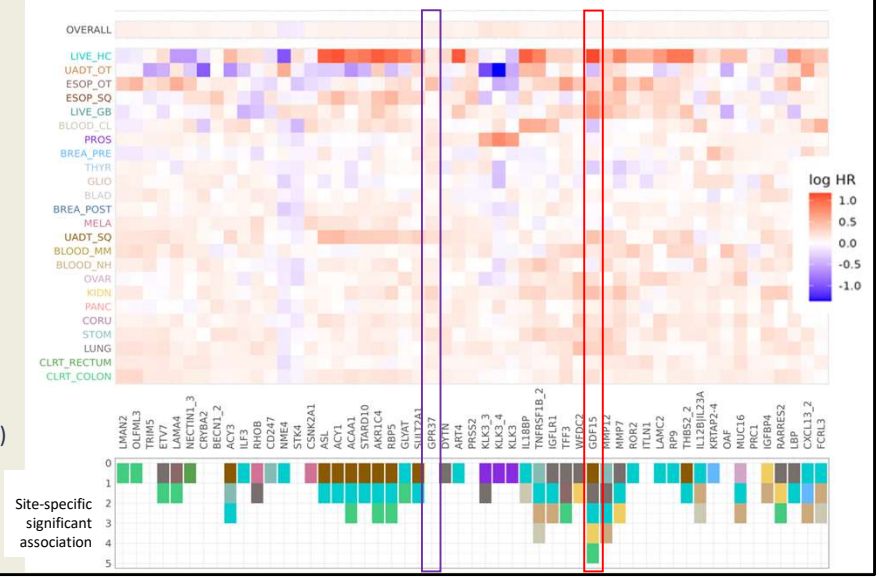
Proteomics and pan-cancer risk in EPIC

- **7k proteins (SomaScan)** measured in 10k EPIC participants (blood)
- 53 proteins associated with **overall cancer**
- 1,640 proteins associated with ≥ 1 cancer site
- FDR-corrected results

Biostatistics and Data Integration (BDI) Team, *in preparation*

Director's Report - SC/61st Session

Site-specific associations for the 53 proteins associated with overall cancer



NME

A large set of proteomics data was recently measured in16 thousands samples in EPIC using the SomaLogic assay.

The NME branch led a study relating 7k protein concentrations to the risk of 24 distinct cancer sites, as well to the risk of cancer overall.

More than 16 hundreds proteins were found to be associated with at least one cancer site.

Also, a total of 53 proteins were associated with overall cancer. Specifically, we observed:

- Proteins that were associated in several site-specific analyses, like GDF15, circled in red.
- Proteins whose association did not reach statistical significance in any of the site-specific analyses, but that showed a consistent association across the 24 cancer sites, like GPR37, circled in blue.

These results illustrate the unique and novel value of the EPIC proteomics data, which will likely lead to the identification of biological pathways involved in the carcinogenesis across several cancer sites.
Several site-specific analyses on the role of proteomics data are currently ongoing in EPIC, as well as analyses on mortality, CVD and T2D.

Hepatic Steatosis, Liver Cancer and Mortality

- **M**etabolic dysfunction–**Associated S**teatotic **L**iver **D**isease (MASLD) is characterized by fat accumulation in the liver
- **MASLD** is closely linked to obesity, unhealthy lifestyle habits and the Metabolic Syndrome
- Associations with risk of hepatocellular carcinoma and mortality were investigated **in EPIC**

T1: Hepatocellular carcinoma (HCC) hazard ratios (95% CI) for MASLD

MASLD Index[1]		
HCC Risk	**No MASLD**	**MASLD**
Crude Model [1]	1.00	**5.65** (3.11, 10.28)
Multivariable Model [2]	1.00	**6.66** (3.17, 13.98)

1. Crude model conditioned on matching factors (centre, age, sex, time of the day and fasting status at blood collection, menopausal status and hormone replacement therapy)
2. Multivariable model adjusted for smoking, physical activity, lifetime alcohol pattern, education level and alcohol intake at recruitment.

T2: Mortality Hazard ratios (95% CI) for MASLD

MASLD Index[1]		
Mortality Risk [2]	**No MASLD**	**MASLD**
All-cause	1.00	**1.40** (1.26, 1.56)
Cancer mortality	1.00	**1.27** (1.08, 1.51)
CVD mortality	1.00	**1.60** (1.20, 2.11)

1. MASLD estimated by application of the fatty liver index and based on EASL criteria. **2.** Model stratified by centre, sex, and age; adjusted for smoking, physical activity, lifetime alcohol pattern, education level, HbA1c, fasting status and Mediterranean diet score.

Mayen AL et al. *BMC Med* 2024

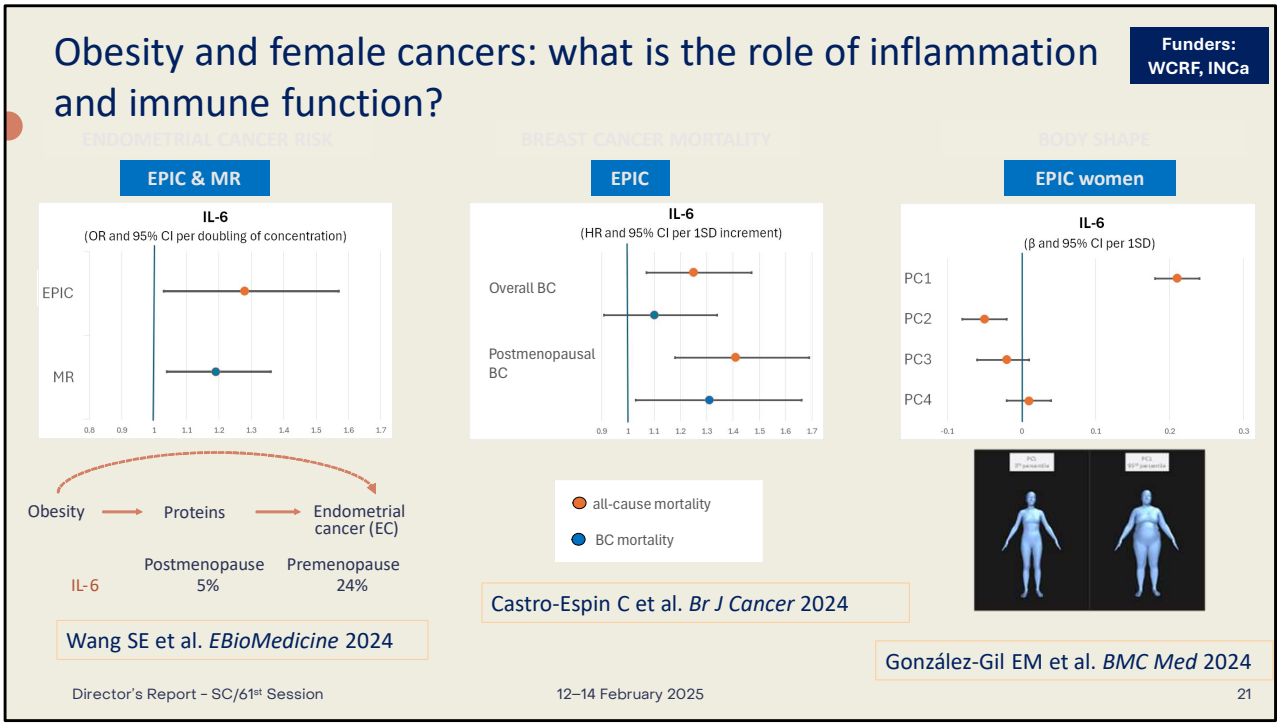
NME

Hepatic steatosis, or fat accumulation in the liver, is linked to unhealthy diets and lifestyles, contributing to metabolic dysfunction. The extent of its association with risk of mortality or liver cancer development is unclear. In a study within the EPIC cohort, metabolic dysfunction-associated steatotic liver disease (MASLD) was estimated via the Fatty Liver Index and following criteria established by the European Association for the Study of the Liver.

In Table 1, on the left, findings published in BMC Medicine, display strong associations between MASLD and the risk of hepatocellular carcinoma using data from a case-control study nested within EPIC.

Table 2, on the right, shows that MASLD is strongly associated with increased risks of all-cause, cancer, and cardiovascular mortality.

These studies provide additional evidence on the importance of improving individuals' metabolic health for preventing hepatocellular carcinoma, as well as all-cause and cause-specific mortality



NME

Inflammation and immune function are suspected to play a major role in cancer development and progression, and may offer an important biological pathway in the relationship between excess adiposity and some female cancers.

We conducted a series of studies nested within EPIC and other cohorts to investigate this interplay. In a first study on about 600 case-control pairs from EPIC, on the left-hand side of slide, InterLeukin-6 was associated with a 18% increased risk of endometrial cancer and this association was confirmed in Mendelian Randomization analyses. IL-6 mediated 24% of the association between obesity and endometrial cancer before menopause and 5% after menopause. In a second study, we observed that pre-diagnostic IL-6 levels were associated with a higher all-cause and breast cancer specific mortality among breast cancer patients after adjusting for tumour characteristics and lifestyle factors, including body-mass-index.

In a third study, to the right hand-side of the slide, principal components reflecting body shapes were differentially associated to IL-6. These results suggest that inflammatory process related to cancer outcomes could be specific to the distribution of adiposity in human bodies.

Ultra-processed foods and risk of cancer

- Ultra-processed foods (UPF) associated with the risk of head & neck cancer and oesophageal adenocarcinoma
- Does adiposity (Waist Hip Ratio) mediate the relationship between UPF and these cancers?

	N	Mediation by Waist-Hip ratio	HR	(95% CI)	P-value
Head and neck cancer	910	Total effect	1.23	(1.12, 1.33)	<0.001
		Direct effect, HR	1.22	(1.11, 1.32)	<0.001
		Proportion mediated	5 %	(2.70, 10.3)	-
Oesophageal Adeno Carcinoma	215	Total effect	1.20	(1.02, 1.36)	0.03
		Direct effect, HR	1.17	(0.99, 1.33)	0.06
		Proportion mediated	15 %	(7.63, 72.3)	-

Table 1. UPF (per 10% g/d increase) and the risk of **head & neck cancer** and **oesophageal adenocarcinoma** and proportion mediated by WHR.

Morales-Berstein et al. *EJN* 2024

- WHR accounts for <15% of the UPF and these cancers
- Other mechanisms may be involved, e.g. food additives, contaminants present in UPF

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NME

The consumption of Ultra Processed Food (UPF) has been associated with several cancer sites, including head & neck cancer and oesophageal adenocarcinoma.

In an EPIC study led by scientists in the NME branch, we investigated whether the associations between consumption of UPF and the risk of head and neck cancer and oesophageal adenocarcinoma was mediated by adiposity, specifically participants' waist-to-hip ratio measured at baseline. As one can see, the results in the Table show that mediation analyses suggested that Waist Hip ratio explained a modest proportion of the relationship between UPF and the risk of Head and Neck and Oesophageal carcinoma.

This study indicated that other mechanisms, in addition to the obesogenic effects of UPF, are expected to be involved in these relationship, including food additives and contaminants present in UPF. Associations between UPF and these cancers might be partially driven also by residual confounding from smoking habits and socio-economic position.

Considering the digital aspects of biobanking and medical research

- Biobanks concentrate significant volumes of physical samples and of associated data.
- There is limited understanding of current regulatory frameworks in low- and middle-income countries (LMICs) in relation to healthcare data of biobanks.
- There is limited understanding on how digital technologies impact LMICs medical research and medical services.
- A series of publications and a book were produced in 2024, often with the collaboration of BCNet members from LMICs.


A Review of Regulatory Frameworks for Biobanking in Southeast Asia

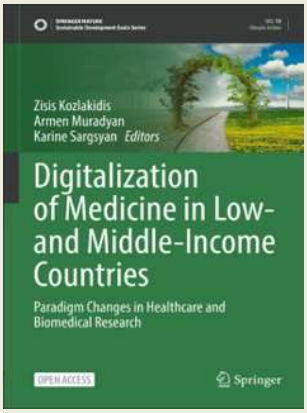
Plebeian B. Medina,[1] Subasri Armon,[2] Mohammad Firdaus Bin Abdul Aziz,[3] Io Hong Cheong,[4] Marian P. de Leon,[5] Sonia Drobysz,[6] Muhd Haziq Fikry Bin Haji Abdul Momin,[7] Debra Leiolani Garcia,[8] Diah Iskandriati,[9] Zisis Kozlakidis,[10] Lin Cui,[11] Seanghorn Mao,[12] Mary Elizabeth Miranda,[13] Khin Mar Mya,[14] Lingeswran Nallenthiran,[15] Marie Christine Obusan,[16] Kongchay Phimmakong,[17] Phyu Sabai,[18] Channada Saejung,[19] Hans Prakash Sathasivam,[20] Faizatul Lela Binti Jafar,[20] Rodel Jonathan S. Vitor, ,[21] Ailyn M. Yabes,[22] Alan B. Calaor,[23] Viji Vijayan,[24] and Raymond T. P. Lin[25]

The Information and Communication Technology Maturity Assessment at Primary Health Care Services Across 9 Provinces in Indonesia: Evaluation Study

Dewi Nur Aisyah[1,2,3], PhD; Agus Heri Setiawan[2], MSc; Alfiano Fawwaz Lokopessy[2], BSc; Nadia Faradiba[2], BDent; Setiaji Setiaji[2], MSc; Logan Manikam[1,3], PhD; Zisis Kozlakidis[4], PhD

Developing a New, Digitally Integrated Research Infrastructure: Results of the Macau Biobank Survey

Io Hong Cheong,[1,2] Debra Leiolani Garcia,[3] Zisis Kozlakidis,[4] Yunchang Shao,[5] Hui Wang[1]



- An open access book, by Springer in the SDG series.
- Includes 80+ authors from 19 LMICs.

LSB

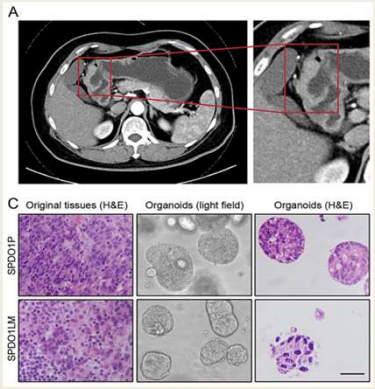
- Biobanks concentrate significant volumes of physical samples and of associated data. Increasingly the data volumes surpass those of physical samples.
- There is limited understanding of current regulatory frameworks in LMICs in relation to healthcare data for research and data kept in biobanks.
- There is limited understanding on how digital technologies impact the LMICs medical research, biobanking and the wider medical services ecosystem.
- A series of publications and a book were produced in 2024, often with the collaboration of BCNet members from LMICs, summarising the current understanding of the digital aspects of biobanking and medical research.

Next generation biobanking: cancer organoids

- Organoid technology has developed rapidly in the last few years.
- Organoids are a 3D cellular model in vitro, which can simulate the characteristics of parental organs in terms of tissue structure, cell function, and genomic profile.
- Organoids have been widely used in biomedical research, especially in cancer research.
- However, there are challenges when it comes to biobanking organoids, such that they retain the characteristics of the original tissue in the long-term. Several collaborations are ongoing to address these biobanking challenges.

Yang, R., Kwan, […], Kozlakidis, Z. and Yu, Y., 2024. Drug-induced senescence by aurora kinase inhibitors attenuates innate immune response of macrophages on gastric cancer organoids. *Cancer Letters*, *598*, p.217106.

Yang, R., Qi, Y., […], Kozlakidis, Z. and Yu, Y., 2024. Paired organoids from primary gastric cancer and lymphatic metastasis are useful for personalized medicine. *Journal of Translational Medicine*, 22(1), p.754.



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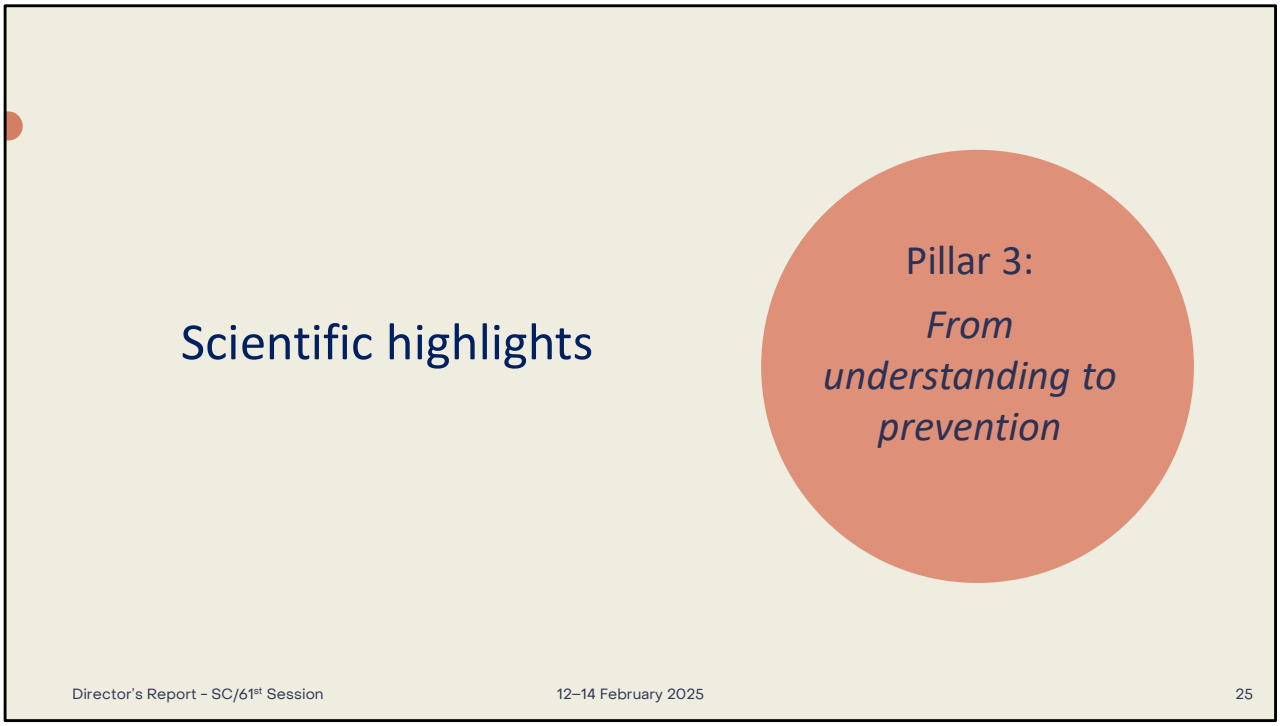
LSB

Organoid technology has developed rapidly in the last few years. Organoids are a 3D cellular model in vitro, which can simulate the characteristics of parental organs in terms of tissue structure, cell function, and genomic profile.

Organoids have been widely used in biomedical research, especially in cancer research. However, there are challenges when it comes to biobanking organoids, such that they retain the characteristics of the original tissue in the long-term. Several collaborations are ongoing to address these biobanking challenges. The current publications focused on gastric cancer, as it is a difficult cancer to study and treat and presents numerous challenges in relation to reliable organoid generation.



The following slides present some scientific highlights for **Pillar 3 – from understanding to prevention**, that includes the **Environment and Lifestyle Epidemiology (ENV) Branch**, the **Epigenomics and Mechanisms (EGM) Branch**, and the **Early Detection, Prevention and Infections (EPR) Branch**.

Cancer Care Terminology in African Languages

- Unique survey led by an IARC postdoctoral fellow Dr Simba from Zimbabwe
- 107 responses, 32 countries, 44 African languages
- "Cancer" translations classified as:
  - phonetic or borrowed terms (32%)
    - e.g. 'saratani' from Arabic
  - unknown term (28%)
  - neutral connotation (22%)
  - negative connotations (18%)
  - – e.g. of fear, tragedy, incurability, and fatality.

- "Radiotherapy" had the highest percentage of negative connotations (22%]), e.g. describing treatment as burning with fire, heat, or electricity.
- Highlights attention needed to guide and develop cancer communication free from fear, stigma or blame.

Simba et al. *JAMA Network Open* 2024

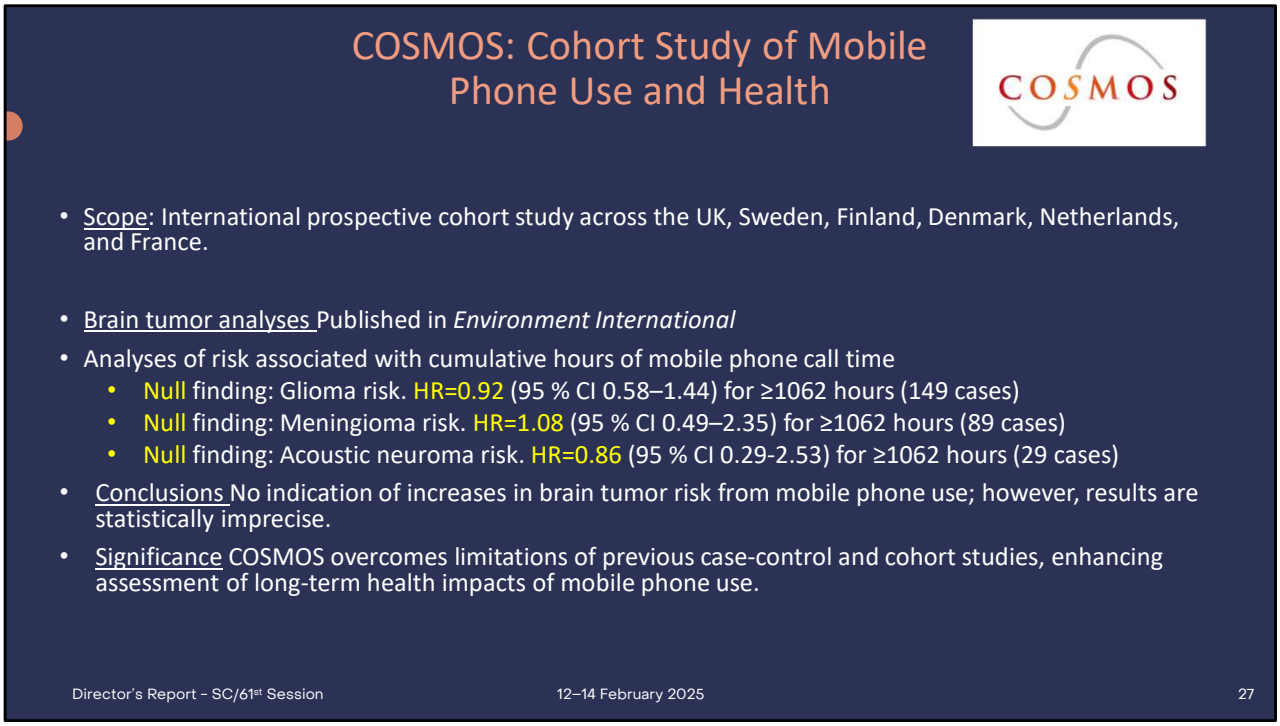
ENV Branch

The Environment and Lifestyle Epidemiology (ENV) Branch conducts a wide range of fieldwork epidemiology studies in low- and middle-income countries, including in African countries.

Coupled with this, they have a strong capacity building element. The present work exemplifies a unique undertaking of one of these African postdocs, Dr Hannah Simba, who herself came to IARC via the IARC Fellowship program.

Clinicians has expressed to ENV scientists concerning the challenges of communicating a cancer diagnosis and treatment to patients, so ENV conducted a survey to obtain a comprehensive overview of this topic. 32 countries were included. Many languages used English or Arabic term for cancer.

When advising cancer patients on their therapeutic course, "radiotherapy" was the most challenging modality to communicate. Words such as GRILLLING, ROASTING, BURNING WITH FIRE or ELECTRICITY were used, instilling fear. The work highlights attention to a neglected area in patient communication as we expand cancer therapeutic access across the region.



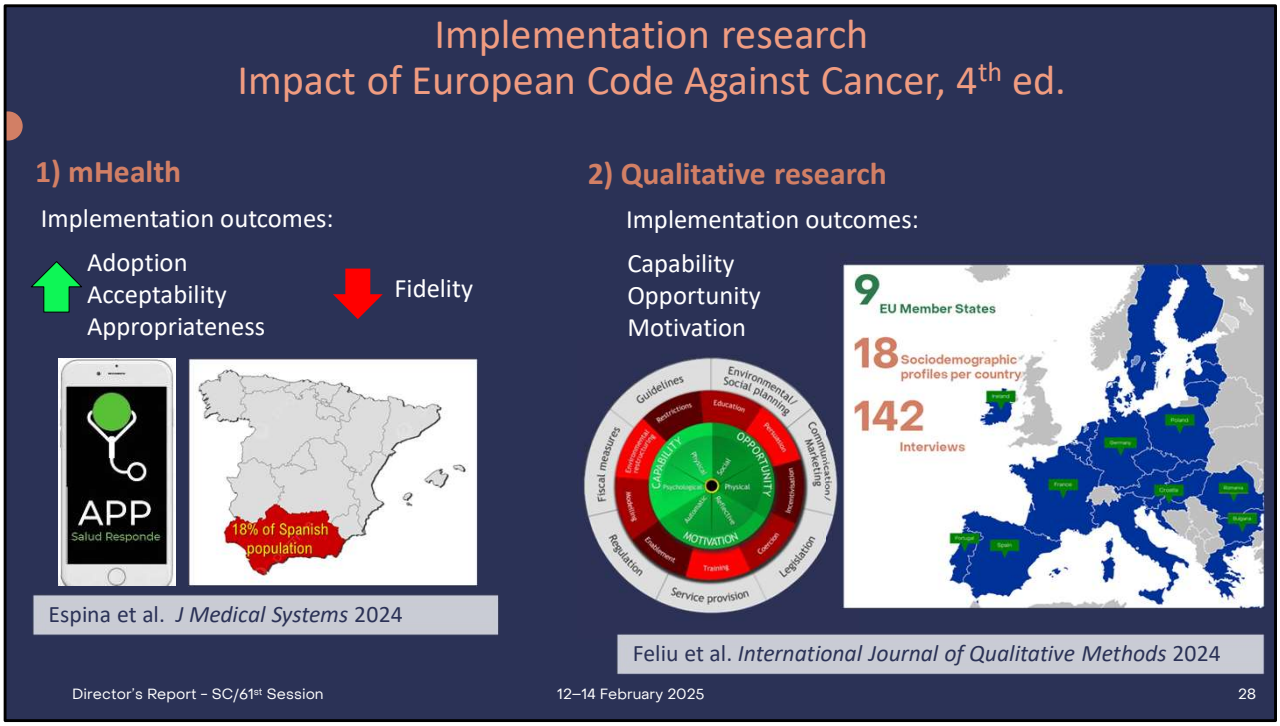
ENV Branch

Cosmos is the international prospective cohort study of mobile phone use and health, with subcohorts in the

The brain tumour analyses have recently been published in *Environment International*. These analyses were conducted on about 270 thousand participants which had accrued 1.8 million person-years of observation.

ENV did not find associations between mobile phone usage and occurrence of glioma, meningioma or acoustic neuroma.
There was no indication of increased risk with mobile phone usage, but the results are statistically imprecise.

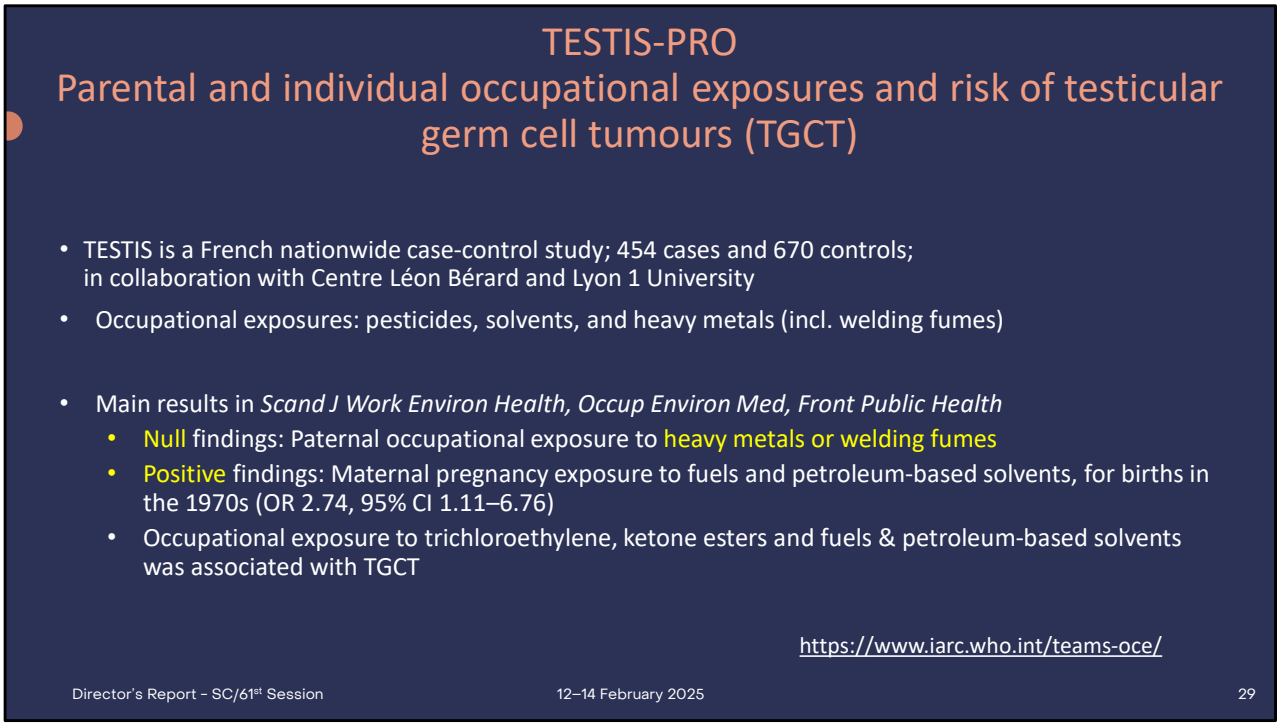
The Cosmos study addresses limitations of previous



ENV Branch

2 implementation research studies on the impact of the 4th edition of the European Code Against Cancer:

- The first is a mobile Health or mHealth feasibility study carried out in Spain:
    - It is a population-based intervention study to investigate the impact of periodic broad dissemination of cancer prevention messages from the European Code through an APP of the Ministry of Health that reaches 67% of the population of Andalusia, the largest community of Spain.
    - It was designed under the Conceptual Framework for Implementation Outcomes, and the outcomes measured were adoption, fidelity, appropriateness and acceptability of the intervention, where all outcomes were high except fidelity, probably partly due to the disruptions that the study suffered by the Covid-19 pandemic
- The second is a qualitative research study across the EU to investigate the perceptions towards the adoption of European Code in the general population
    - It is a multi-country study to explore perceived capability, opportunity, and motivation of the general population to adopt the cancer prevention recommendations of the European Code, and to identify the barriers and facilitators for the adoption
    - It is framed under the COM-B model of behaviour that is widely used to identify what needs to change for a behaviour change intervention to be effective
    - The protocol has been published, and the thematic content analysis is currently been finalized to present the outcomes of capability, opportunity and motivation.



ENV Branch

TESTIS Pro is an extension of the TESTIS project - a French nationwide case-control study including 454 cases and 670 controls. This study was conducted in close collaboration with Centre Léon Bérard and Lyon 1 University as well as clinicians and exposure assessment scientists.

The main occupational exposures of interest were pesticides, solvents, and heavy metals including welding fumes.

At present we have published 6 papers from this project funded by Fondation de France.

The main results so far are:

- Paternal occupational exposure to heavy metals or welding fumes was not associated with TGCT development in their sons
- Maternal exposure to fuels and petroleum-based solvents during the pregnancy in sons born in the 1970s (OR 2.74, 95% CI 1.11–6.76) increased the risk of TGCT, i.e. in sub analysis by birth year
- Occupational exposure to trichloroethylene, ketone esters and fuels & petroleum-based solvents was associated with TGCT

Preliminary results in preparation or recently submitted include:

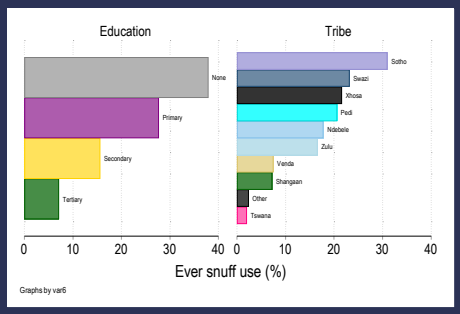
- Paternal occupational exposure to herbicides at birth was associated with risk of TGCT in their sons

- Exposure to high levels of pesticides was significantly associated to TGCT
- Occupational exposure to lead, iron, cadmium, chromium, nickel and welding fumes was associated with TGCT. Metals and solvents are highly correlated, so it is not possible to fully distinguish their effects in observational studies. The full references and papers are available from the Occupational Cancer Epidemiology team (OCE) webpage (https://www.iarc.who.int/teams-oce/).

Smokeless Tobacco in South African Women

Nasal use of smokeless tobacco (snuff) is practiced by some Black South African women but has been rarely studied in relation to cancer risk.

- Case-control studies designed within the Johannesburg Cancer Study
- Snuff use exceeded 30% in some tribes and displayed strong social gradients.
- **Increased cancer risks** were found for:
  - Cervical Cancer
  - Vulval Cancer in current non-smoking snuff users



Motlhale et al. *Int J Cancer* 2025

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ENV Branch

Nasal use of smokeless tobacco (snuff) is practiced by some Black South African women but has been rarely studied in relation to cancer risk. The exposure habits in these women are of interest, as use often starts in middle age or later. ENV conducted case-control studies designed within the Johannesburg Cancer Study. The prevalence of ever snuff use exceeded 30% in some tribes and displayed strong social gradients.

Increased cancer risks were found for:

- Cervical Cancer
- Cancer of the eye
- Vulval Cancer in current non-smoking snuff users

Further studies of snuff use in South African women are needed, especially associated with suggested genital exposure routes.

Childhood Cancer in sub-Saharan Africa: Studying the epigenome of paediatric Leukaemia and Burkitt Lymphoma

Cohorts of Biological samples

Dried Blood Spots Blood

APPROACHES

- Collaborations with hospitals in different sub-Saharan African countries (Burkina Faso, Kenya, Tanzania, Malawi) for biological samples collection
- DNA methylome profiling, multi-infections analyses, metabolomics, targeted mass spectrometry (i.e. mycotoxins)

OUTCOMES

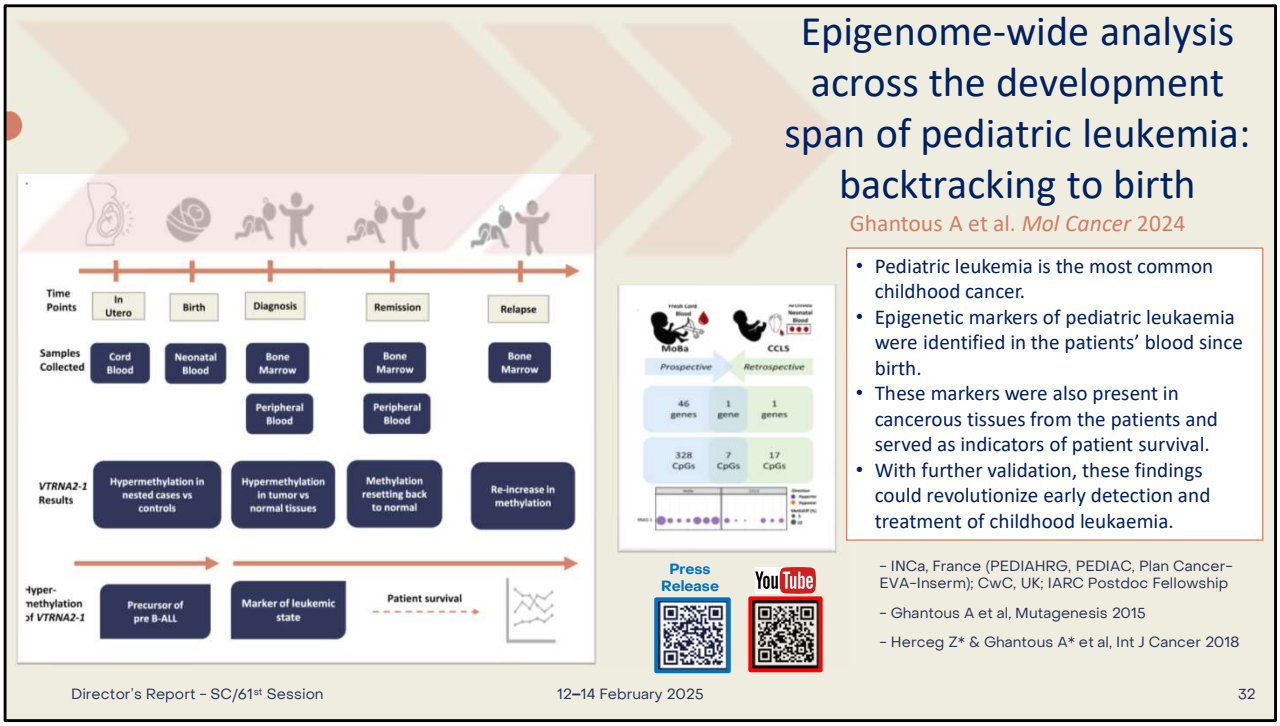
- Identification of risk factors specific to sub-Saharan Africa
- Mechanisms of carcinogenesis
- High resolution omics datasets from less represented regions
- Biomarkers of exposures, cancer risk and outcomes
- Basis for prevention studies and actions

Odongo et al. *PNAS* 2024
Mouchtaris-Michailidis et al. *Crit Rev Food Sci Nutr* 2024

EGM Branch

Endemic Burkitt lymphoma and Leukaemia are the most prevalent childhood cancers in sub-Saharan Africa. However, their specific risk factors and molecular profiles are less studied in comparison to paediatric cancers from other regions in the world.

Therefore, EGM in partnership with ENV and researchers from Ghent University (Belgium) and Princess Maxima Centre (Netherlands) established collaborations with local partners from different countries of sub-Saharan Africa to collect biological samples from children at early life or at diagnosis. Those samples will be subjected to multi-omics, multi-infections and metabolomics analyses, which will allow to further identify risk factors, understand the mechanisms of development of these cancers and identify biomarkers of exposures, cancer risks and outcomes. Altogether this will set the basis for prevention studies and actions.



EGM Branch

Scientists from EGM and partner institutions have identified molecular markers in blood samples from newborn babies that may indicate a greater risk of developing leukaemia, the most common cancer type that affects children. These markers were also present in cancerous tissues from patients with leukaemia, and they served as indicators of patient survival. The findings were published in the journal *Molecular Cancer*.

The scientists searched for epigenome (DNA methylation) markers in surrogate (blood) and cancerous tissues across the development span of paediatric leukaemia, including at birth, diagnosis, remission, and recurrence. This study uncovered epigenetic precursors of leukaemia that could be detected at birth, before children develop the disease. In the absence of changes in the DNA code, the methylation levels of specific areas of DNA were differently modified in the blood of children who went on to develop paediatric leukaemia compared with those who did not. These epigenetic marks remained detectable in cancerous tissues collected at diagnosis, and hypermethylation was associated with significantly worse patient survival. The findings were reproducible with different technologies, in three continents, and in two ethnicities.

These results provide a proof of concept for the detection at birth of epigenetic alterations that predispose to paediatric leukaemia and affect the course of the disease in patients. Unlike genetic defects, epigenetic modifications are potentially reversible, and they can offer actionable targets for personalized therapy. These findings also hold promise for early detection of paediatric leukaemia, especially given that blood-based biomarkers are easy to measure and amenable to population screening.

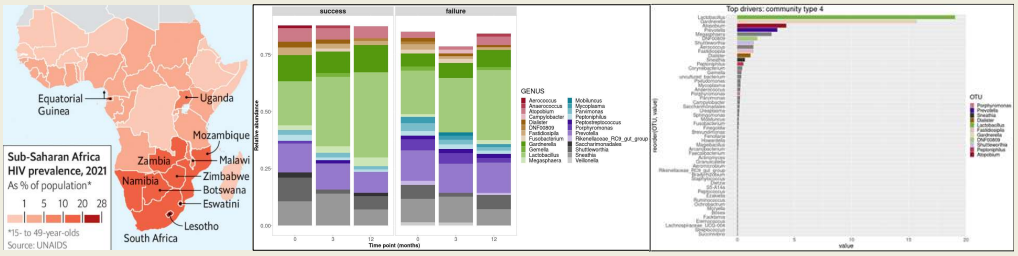
Vaginal microbiome composition in HIV-positive women undergoing treatment of cervical transformation zone in a screen and treat programme in Zambia

Background. The success rate of treatments for premalignant cervical lesions has been reported to be significantly lower in women living with HIV (WLHV) compared to HIV-negative women, irrespective of the treatment method used (Basu et al, *Nature Medicine* 2024).

Objective. The present proof-of-principle study aimed to assess the vaginal microbiome composition in WLHV undergoing treatment of cervical transformation zone in Zambia and correlate it with treatment outcome.

Design. Vaginal microbiome composition was evaluated in 46 WLHV selected for either ablative or excisional treatment of cervix just before treatment and three- and twelve-months posttreatment.

Results. In the group of women who experienced treatment success, an increasing abundance of *Lactobacillus* over time was observed, accompanied by a decreasing abundance of pathogenic bacteria. This trend was further confirmed when stratifying by HPV status and through clustering analysis (e.g., Cluster 4, which had a treatment success rate of 80%).

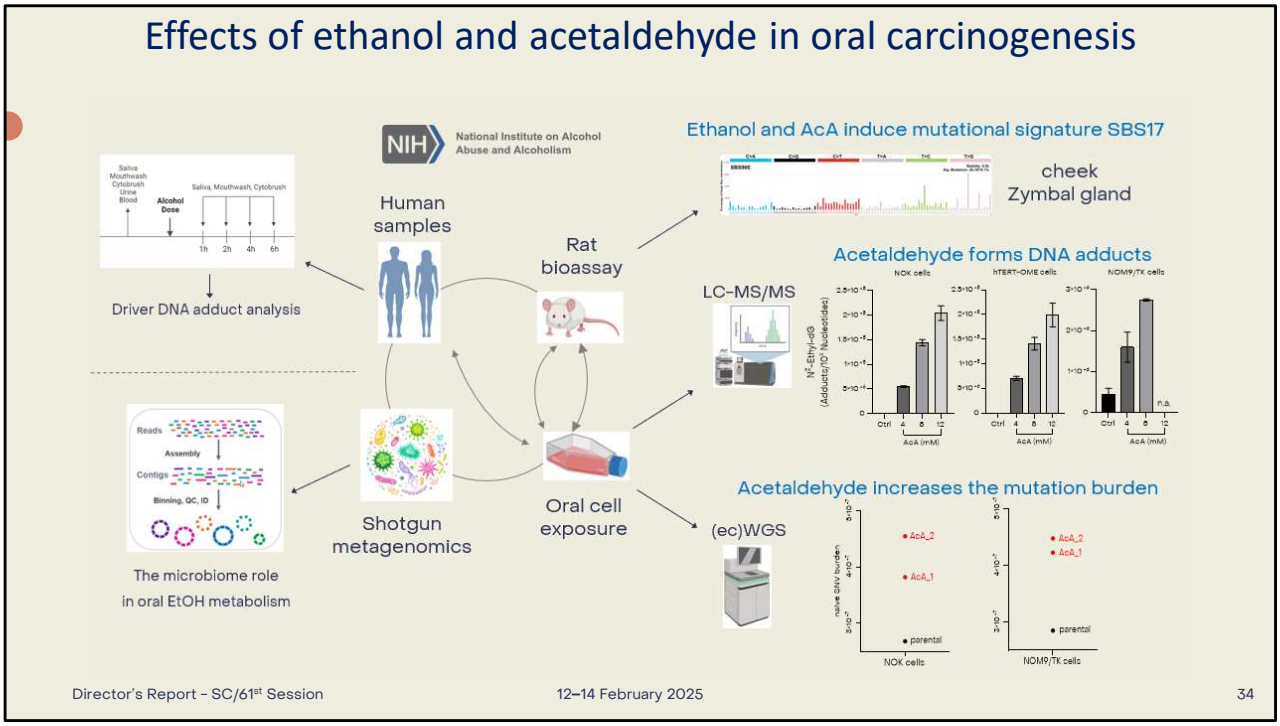


These findings suggest that a **specific microbiome profile** dominated by *Lactobacillus* may be considered as a **potential predictive biomarker** of a positive response to cervical lesion treatments.

Director's Report - SC/61st Session 12–14 February 2025 Pinder et al. *AIDS*, under review 33

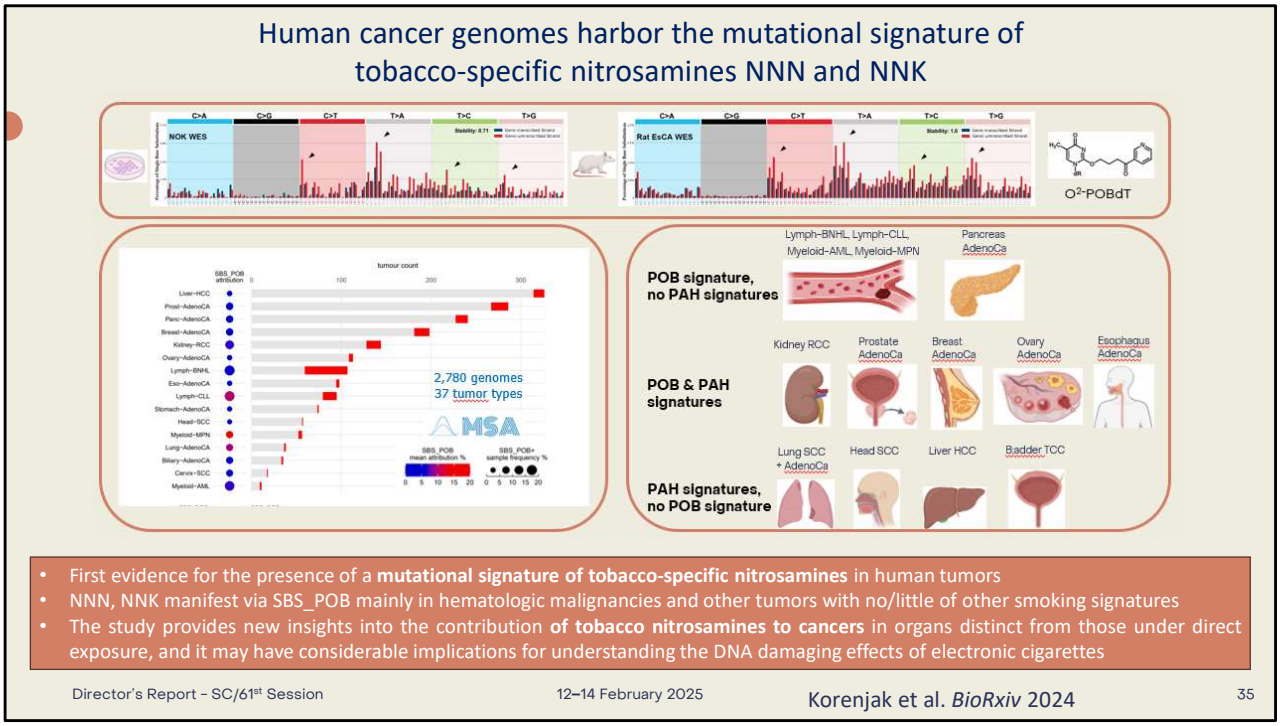
EGM Branch

A 2024 Nature Medicine article by Basu et al. (EPR Branch) reported lower treatment success rates for cervical lesions in women living with HIV (WLHV) compared to HIV-negative women. As shown in this slide, analysis of the vaginal microbiome revealed that successful treatment correlated with an increase in Lactobacillus and a decrease in pathogenic bacteria over time. These findings suggest that Lactobacillus-dominant profiles could serve as predictive biomarkers for favourable cervical lesion treatment outcomes in HIV-positive patients.



EGM Branch

EGM and partners conduct an NIH/NIAAA-funded study on the role of ethanol and acetaldehyde in oral carcinogenesis. A broad, multisystem approach looks at the DNA damage in vivo and in vitro. The new mechanistic results obtained by IARC EGM show that mutational signature SBS17 forms in ethanol and acetaldehyde exposed rat tumors of the head area; and 2) acetaldehyde treatment induces DNA adducts and, 3) importantly, increases the genome-wide mutation burden in human non-cancer oral cells, suggesting specific modes of action for the carcinogenicity of ethanol or acetaldehyde.



EGM Branch

The causal roles of most of the specific chemical components present in tobacco in human cancer development are not clear. Therefore, the EGM Branch characterized the mutational signatures and underlying DNA damage of tobacco-specific nitrosamines in experimental models. The identified signature was then computationally screen for in almost 3000 cancer genomes from 37 tumor types. This provided the first evidence for the presence of a mutational signature of tobacco-specific nitrosamines, the POB signature, in tobacco-associated human cancers. The signature is predominantly found in certain hematological malignancies and other cancer types with no or little contribution of other smoking signatures.

Moreover, the study provides new insights into the contribution of tobacco nitrosamines to cancers in organs distinct from those under direct exposure, and it may have considerable implications for understanding the DNA damaging effects of electronic cigarettes, which also contain nicotine-derived nitrosamines.

Efficacy of single dose of HPV vaccine 15 years post-vaccination: outcomes from a cohort study in India

- A cohort of females vaccinated at 10-18 years of age in 2009–2010 is being followed up for immunogenicity, efficacy against persistent infection and CIN 2/3 end points over last 15 years
- The cohort includes recipients of a single dose (N=4949); 2-doses (*N=4980*) & 3-doses (*N=4348*) of Gardasil
- An unvaccinated age-matched cohort was recruited post-hoc (*N=5172*)
- **Median follow up of 12 years** demonstrate proportion of single dose recipients getting persistent HPV 16/18 infection is extremely low (0.1%; 95% CI: 0.0-0.3)
- Vaccine efficacy against persistent HPV 16/18 infection was **92.0% (95% CI: 87-95)- same as 2 or 3 doses**
- No case of HPV 16/18 related CIN 2/3 was detected in vaccinated women against 8 cases in the unvaccinated

Study Group	Women assessed (N)	Persistent HPV 16/18 infection N (%; 95% CI)	Persistent HPV 31/33/45 infection N (%; 95% CI)
Unvaccinated	1,273	35 (2.7; 1.9-3.8)	17 (1.3; 0.8-2.1)
All vaccinated	9,708	12 (0.1; 0.1-0.2)	54 (0.6; 0.4-0.7)
1-dose	3,022	4 (0.1; 0.0-0.3)	17 (0.6; 0.3-0.9)
3-dose	2,172	2 (0.1; 0.0-0.3)	16 (0.7; 0.4-1.2)
2-dose (D 1 & 180+)	2,311	2 (0.1; 0.0-0.3)	18 (0.8; 0.5-1.2)

Malvi et al. *Natl Cancer Inst Monogr.* 2024.

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EPR Branch

Scientists from EPR and partner institutions have demonstrated that the protection offered by a single dose of quadrivalent vaccine against persistent infection with human papillomavirus (HPV) types 16 and 18 – the HPV types responsible for nearly 80% of cervical cancers in low- and middle-income countries – is as high as that offered by two doses or three doses of the vaccine even **15 years** after the first dose of the vaccine was administered. The new report is part of a special issue of the *Journal of the National Cancer Institute Monographs*, published to coincide with the 36th International Papillomavirus Conference (IPVC), which took place in Edinburgh, United Kingdom, on 12–15 November 2024.

The research team is conducting **long-term follow-up** of a cohort of about 17 000 female participants in India who received three or two doses or a single dose of the quadrivalent HPV vaccine at age 10–18 years in 2009–2010. The vaccine efficacy of a single dose against persistent infection with HPV16 and 18 was found to be 92.0%, which was not significantly different from the efficacy of two doses or three doses of the vaccine. No high-grade cervical precancer associated with HPV16 and 18 was detected among vaccinated participants.

This study demonstrates the high efficacy of a single dose, as well as how vaccination will reduce HPV positivity rates and requirements for colposcopy within cervical screening programmes in real-life settings. The durable protection offered by a single dose 15 years after vaccination and the cost savings associated with lower HPV positivity rates and lower requirements for colposcopy and treatment as the vaccinated women undergo screening will support the decision of the 58 countries that already use a single dose in their HPV vaccination programmes and encourage other countries to do so.

METHIS: modelling cervical cancer elimination

Predictive models fitted with HPV prevalence and vaccination coverage data to inform local cervical cancer elimination policies worldwide.

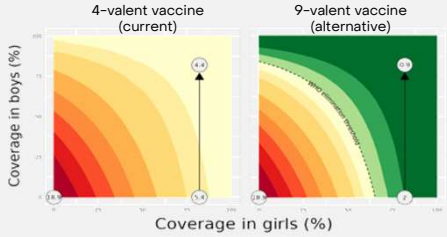
Rwanda

Observed impact on cervical cancer in the survey cohorts
(lifetime risk, cases per 100,000 women born)

Without vaccination	With vaccination
2663 (1989-3462)	1660 (1239-2161)

Sayinzoga et al., *Lancet Glob Health*, 2023

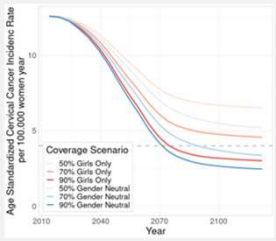
Predicted long-term impact under current or alternative coverages
(age-standardized incidence, cases per 100,000 women-years)

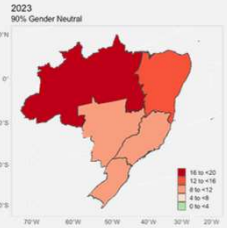


Man et al., *J Natl Cancer Inst Monogr. 2024*

Brazil

The results below have been used to inform National Immunization Technical Advisory Group of Brazil. They show that cervical cancer elimination can be obtained by switching to single-dose vaccination schedule and resource reallocation





The 4-Valent vaccine type currently used in Rwanda would not allow for cervical cancer elimination, even with high coverage gender-neutral vaccination, however a shift to 9-Valent vaccine with a high coverage would entail elimination.

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EPR Branch

Rwanda was the first African country to implement national human papillomavirus (HPV) vaccination (against types HPV6, 11, 16, and 18). In 2011, a school-based catch-up programme was initiated to vaccinate girls aged younger than 15 years, but it also reached older girls in schools. The study aimed to estimate the effect of HPV vaccination on HPV prevalence in Rwanda and on future cervical cancer incidence, based on empirical data collected in a series of cross-sectional surveys in the general population.

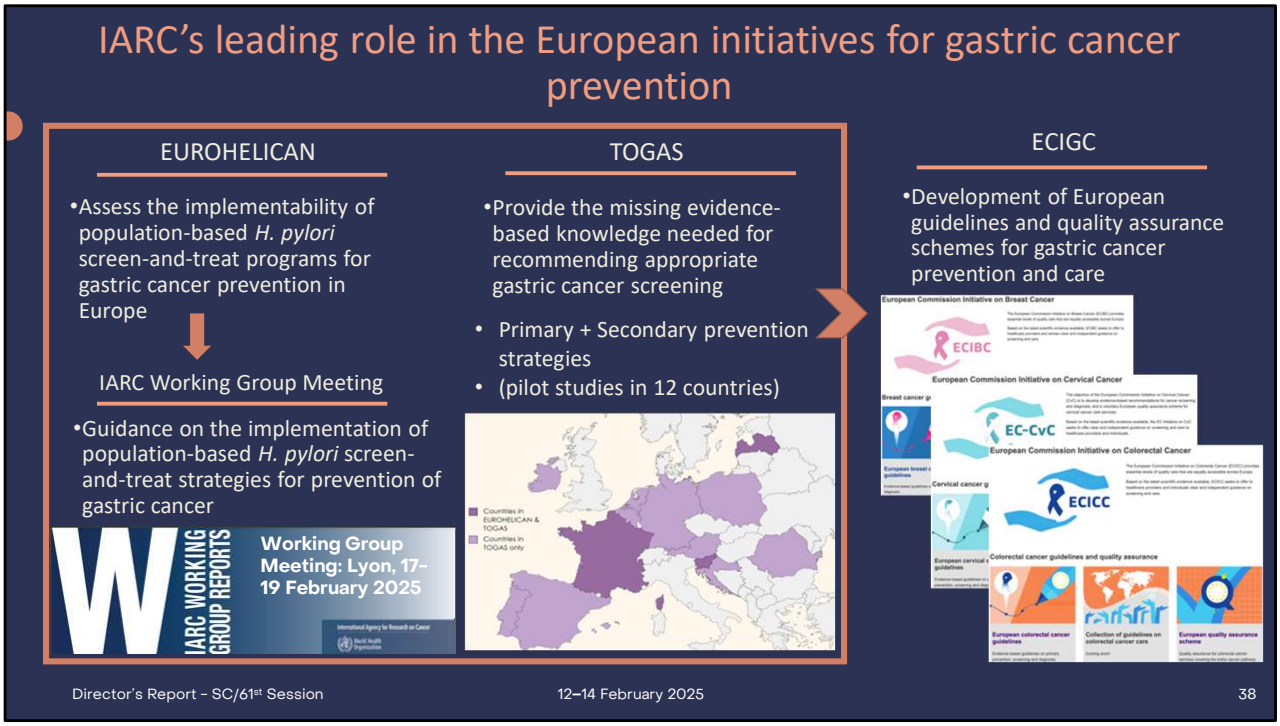
Cross-sectional surveys were done between July, 2013, and April, 2014 (baseline), and between March, 2019, and December, 2020 (repeat), in sexually active women aged 17–29 years at health centres in the Nyarugenge District of Kigali, Rwanda. HPV prevalence was assessed in cervical cell samples. Adjusted overall, total, and indirect (herd immunity) vaccine effectiveness was computed as the

In Rwanda, the prevalence of vaccine-targeted HPV types has been significantly decreased by the HPV vaccine programme, most notably in women who were attending school during the catch-up programme in 2011. HPV vaccine coverage and population-level impact is expected to increase in future cohorts who are eligible for routine HPV vaccination at age 12 years.

Based on our findings, Rwandan public health authorities can reinforce their political and financial commitment towards cervical cancer elimination, improve vaccination coverage, and design adapted cervical cancer screening strategies. Public health authorities in other countries in sub-

Saharan Africa and elsewhere can learn from the Rwandan example, both in terms of implementing HPV vaccination and of monitoring its impact on HPV prevalence and cervical cancer burden.

The researchers found that improving the coverage of the current vaccination programme by reallocating resources could help to attain cervical cancer elimination in India and across all states of Brazil, but not in Rwanda unless the nonavalent vaccine is introduced.



EPR Branch

- IARC plays a leading role in the European initiatives for gastric cancer prevention.
- EUROHELICAN assesses the implementation aspects of the population-based H. pylori screen-and-treat programs for gastric cancer prevention in Europe. As part of the EUROHELICAN project, IARC has convened a Working Group of 32 experts from 21 countries to provide practical guidance on the implementation of the strategy.
- TOGAS, the largest project with 21 consortium members, will complement the EUROHELICAN project by providing, for the first time, essential information on both primary and secondary preventive strategies for gastric cancer in Europe.
- This knowledge and experience will be integrated into the new European Commission Initiative on Gastric Cancer which aims to develop the European guidelines and quality assurance schemes for gastric cancer prevention and care in Europe.

Detection of Molecular markers in breast cancer: Immunohistochemistry (IHC) versus their respective mRNA detection on core biopsy and Fine needle aspiration (FNA)-cell blocks

- **Objective:** to compare detection of ER/PR/HER2/Ki67 by IHC on core biopsy (reference test) to *a) their detection on core biopsy using STRAT4™ (Cepheid) & b) their detection on cell blocks made from FNA samples using STRAT4™*
- **Biopsy confirmed invasive breast cancers (N=104) were included**
- IHC for ER/PR/HER2/Ki67 was reported on core biopsy (reference test)
- STRAT4 analysis was done for four markers on tissue block & cell block (prepared from fine needle aspirate)

Test 1	Test 2 (IHC reported on core biopsy; ref test)						Agreement
STRAT4 on cell blocks	IHC on core biopsy	No. assessed	Test 1+ Test 2+	Test 1+ Test 2-	Test 1- Test 2+	Test 2- Test 2-	
		(n)	(n)	(n)	(n)	(n)	(%)
ER	ER	102	44	2	4	52	**94.1**
PR	PR	102	36	8	2	56	**90.2**
HER2	HER2	101	47	9	9	36	**82.2**
Ki-67	Ki-67	101	65	13	15	8	**72.3**

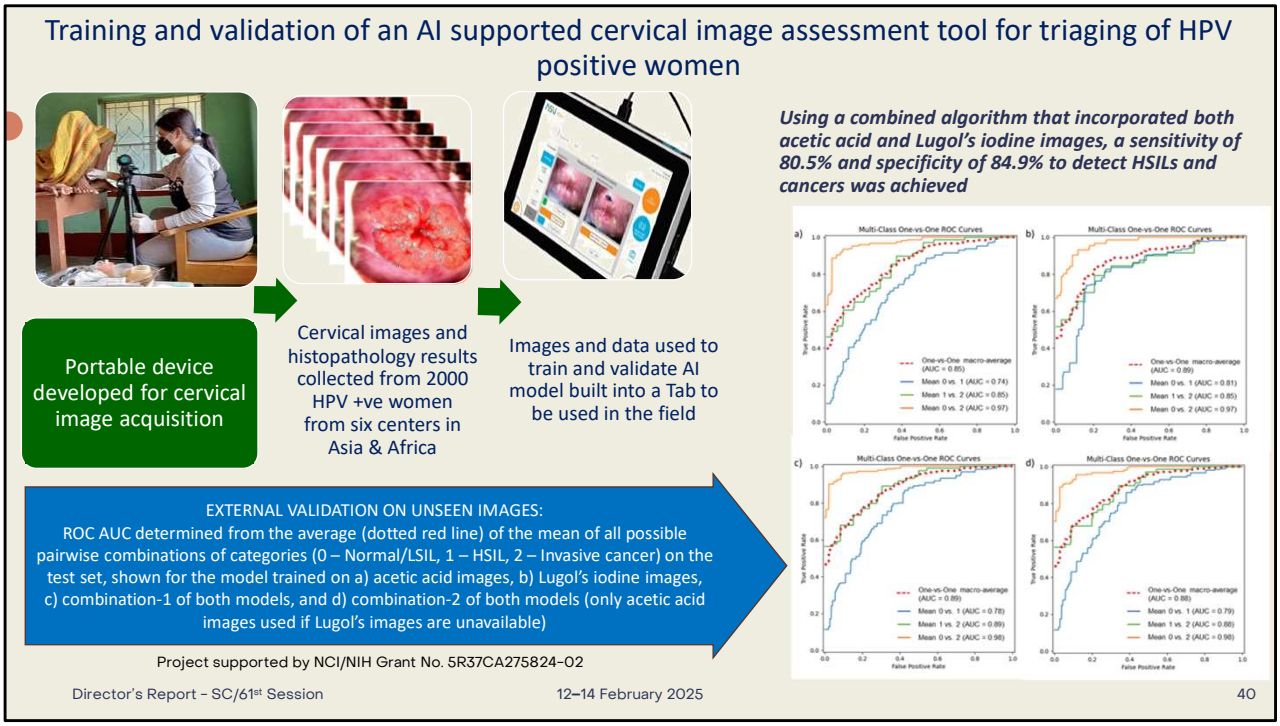
Conclusion: ***STRAT4 can be a simple and objective alternative to IHC with rapid turnover; need for training is minimal and test platform is widely available in LMICs; In settings with challenges in implementing core biopsy, FNA along with STRAT4 on cell blocks may be considered.***

Presentation: *World Cancer Congress 2024*, September 2024, Geneva

EPR Branch

In low- and middle-income countries (LMICs), access to immunohistochemistry (IHC) diagnostics for accurate breast cancer classification—which is critical for determining appropriate treatment and improving survival rates—is limited and often prohibitively expensive. This study, initiated in India and now being expanded to Uganda, aims to address these challenges by offering rapid and cost-effective breast cancer classification using a molecular assay (STRAT4).

The data presented in the table are derived from the project conducted in India. The project in Uganda has recently started.

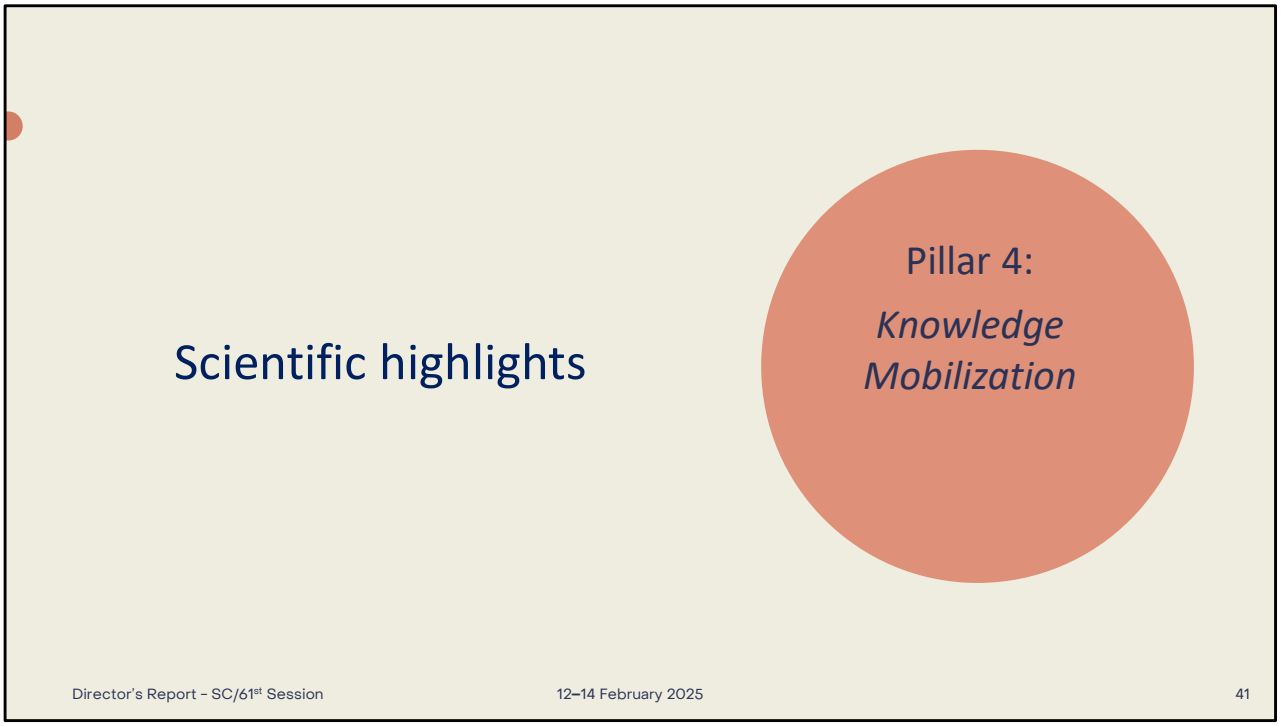


EPR Branch

Scientists from EPR, in collaboration with engineers from NSV Incorporated (USA), have developed a revolutionary new artificial intelligence (AI) tool that can accurately detect cervical precancers and cancers in images of the cervix taken during appointments for cervical cancer screening. This innovative system will contribute to greater equity in global health because it has been designed specifically for use in low-resource settings, in contrast to many other AI and digital health solutions.

To train and validate the system's algorithm, IARC researchers used cervical images collected from nearly 1800 women who screened positive for human papillomavirus (HPV) and had a histopathology diagnosis, including some women living with HIV. The system was then evaluated independently using a different set of images that had not been seen by the algorithm during its training or internal validation. The system performed better than both Pap smear cytology and visual inspection with acetic acid (VIA), the tests currently recommended by the World Health Organization (WHO) to triage women who screen positive for HPV.

The IARC-developed system also offers significant advantages for use in low- and middle-income settings because it does not require an Internet connection to interpret the images, and it is battery-powered.



The following slides present some scientific highlights for **Pillar 4 – knowledge mobilization**, that includes the **Evidence Synthesis and Classification (ESC) Branch** and the **Learning and Capacity Building (LCB) Branch**.

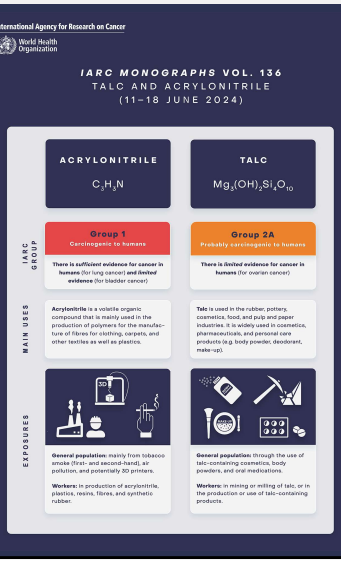
IARC Monographs Programme (IMO)

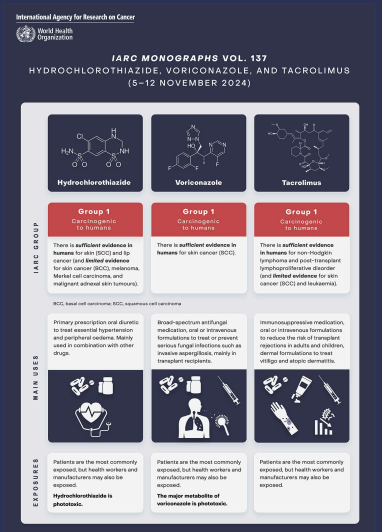
Aim: identify preventable causes of human cancer through systematic review and expert evidence evaluation

Accomplishments in 2024

- Held *Monographs* meetings 136 and 137
  - New or updated classifications for **5 agents**:
  - ✓ **Group 1**: Acrylonitrile, Hydrochlorothiazide, Tacrolimus, Voriconazole
  - ✓ **Group 2A**: Talc
- Convened Advisory Group on Priorities for 2025–2029
  - ✓ More than 220 publicly nominated agents prioritized for evaluation

High priority, ready now: n=94
High priority, ready later: n=32
Medium priority: n=17
No priority: n=82





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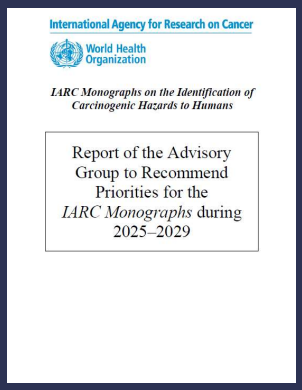
ESC Branch – Monographs Programme

IARC Monographs Programme (IMO)

Scientific accomplishments in 2024

- Published **three articles in *Lancet Oncology***
- Published **two *Monographs* volumes**
  - ✓ v.133: Anthracene, 2-bromopropane, butyl methacrylate, dimethyl hydrogen phosphite
  - ✓ v.134: Aspartame, methyleugenol, isoeugenol
- Published Advisory Group report on Priorities
- Released new IARC Scientific Publication as Volume V in *Statistical Methods in Cancer Research* series



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ESC Branch – Monographs Programme

2024 Highlights of the IARC Handbooks Programme

- **Handbook Vol. 20A " Reduction or Cessation of Alcoholic Beverage Consumption": May 2023**
  - Gapstur et al. (2023) "The IARC Perspective on Alcohol Reduction or Cessation and Cancer Risk". NEJM
  - Q&A and Infographics posted on the Handbooks and IARC websites
  - Full Volume published online and in print
- **Handbook Vol. 20B "Alcohol Policies": October 2024**
  - Collaboration with and partially funded by WHO EURO
  - Special Report submitted to NEJM (December 2024)
- **Handbook Vol. 21 "Lung Cancer Screening": April 2026**
  - Partially funded by UICC
  - Meeting has been announced on IARC and Handbooks websites
- **WCRF project – Early life adiposity and breast cancer incidence**
  - Integration of mechanistic evidence in the overall evaluation by the WCRF CUP global panel (Nov. 2024)
- **Population Attributable Fraction (PAF)**
  - Estimation of the global burden of oral cancer in 2022 attributable to smokeless tobacco and areca nut use (IARC group 1 carcinogens); in collaboration with the Cancer Surveillance Branch
- **Evidence Gap Map (EGM) project**
  - Evidence and gap map (EGM) on oral cancer prevention, based on the systematic reviews from HB 19; in collaboration with the University of New Castle (UK) and the University of Campinas (Brazil)
- Four book reviews of Handbook Vol. 19, published in medical journals in Brazil, India, Poland, Saudi Arabia

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ESC Branch – Handbooks Programme

WHO Classification of Tumours Programme

WCT 5th edition

1. Head and Neck Tumours Parts A and B. WHO Classification of Tumours, 5th Edition, Volume 9. 2024. ISBN-13: 978-92-832-4514-8.
2. Haematolymphoid Tumours Parts A and B. WHO Classification of Tumours, 5th Edition, Volume 11. 2024. ISBN-13: 978-92-832-4520-9.

Published studies 2024

1. *WHO Classification of Tumours: moving towards the sixth edition*. Histopathology. 2024 Sep 18. doi: 10.1111/his.15325. PMID: 39293942.
2. *Moving Forward on Tumour Pathology Research Reporting: A Guide for Pathologists From the World Health Organization Classification of Tumours Living Evidence Gap Map by Tumour Type Group*. Mod Pathol. 2024 Jul;37(7):100515. doi: 10.1016/j.modpat.2024.100515. PMID: 38763419.
3. *A New Hierarchy of Research Evidence for Tumour Pathology: A Delphi Study to Define Levels of Evidence in Tumour Pathology*. Mod Pathol. 2024 Jan;37(1):100357. doi: 10.1016/j.modpat.2023.100357. PMID: 37866639.
4. *Exploratory evidence maps for the WHO Classification of Tumours 5th edition for lung and thymus tumours*. Virchows Arch. 2024 Nov;485(5):869-878. doi: 10.1007/s00428-024-03886-6. PMID: 39448408.

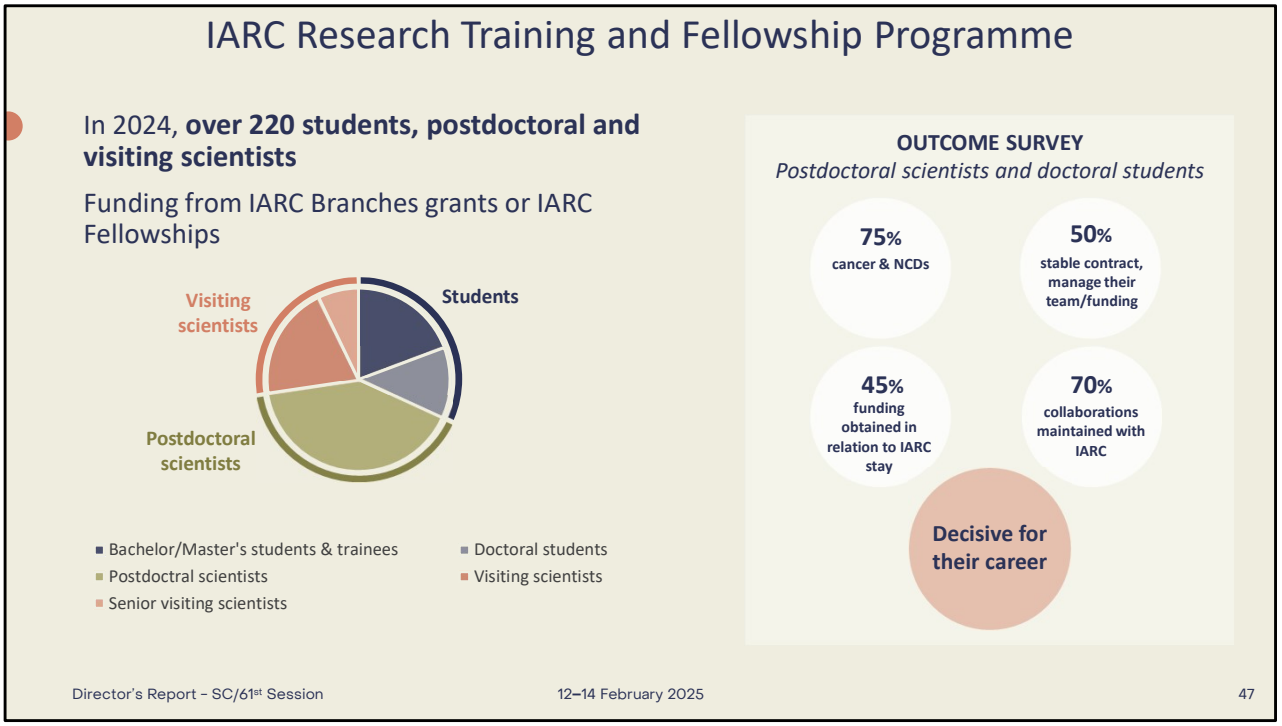
ESC Branch WHO Classification of Tumours (WCT Programme)

WHO Classification of Tumours Programme

Published studies 2024

1. ***Mapping the cited evidence of ductal carcinoma in situ from the 5th edition of the World Health Organization classification of tumours of the breast*. Histopathology. 2024 Sep;85(3):510-520. doi: 10.1111/his.15279. Epub 2024 Jul 18. PMID: 39030792.**
2. ***The World Health Organization Reporting System for Pancreaticobiliary Cytopathology: Overview and Summary*. Cancer Cytopathol. 2024 Jul;132(7):396-418. doi: 10.1002/cncy.22806. PMID: 38709670.**
3. ***A Preliminary Investigation into Search and Matching for Tumor Discrimination in World Health Organization Breast Taxonomy Using Deep Networks*. Mod Pathol. 2024 Feb;37(2):100381. doi: 10.1016/j.modpat.2023.100381. PMID: 37939901.**

ESC Branch WHO Classification of Tumours (WCT Programme)



LCB Branch

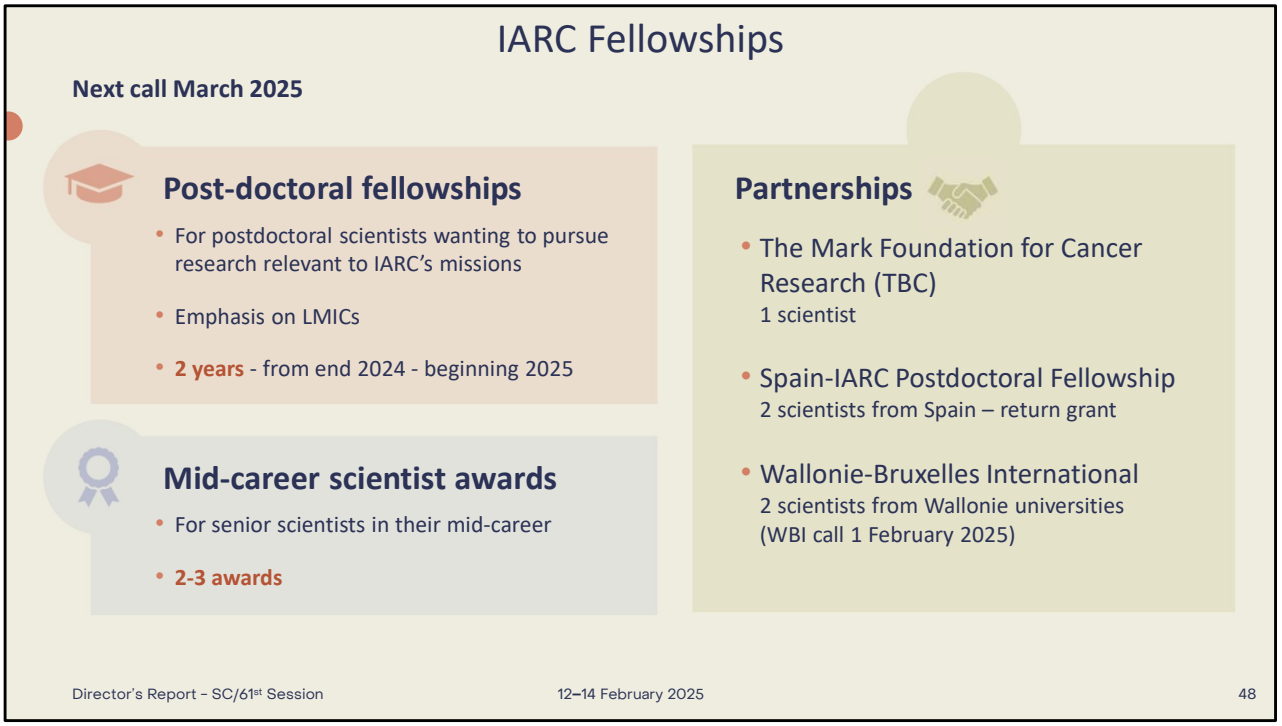
The Research Training and Fellowship Programme offers researchers at different levels of their career opportunities to get trained at IARC through their participation in collaborative research projects.

Those Early Career and Visiting Scientists (ECVS) are supported either by project funds from IARC Groups or by IARC Fellowships.

Over 220 ECVSs were hosted at IARC in 2024, among which over 90 postdoctoral scientists. This is an increase compared to previous years and is certainly related to the success of scientific branches to increasingly attract external funding.

We periodically carry out outcomes surveys to document the impact of the programme and to identify areas of improvements. The latest survey was conducted early 2024 targeting over 140 doctoral students and postdoctoral scientists who benefited from the Programme between 2019 to early 2024.

Results are consistent with data collected in the 5 previous survey carried out since 2012: the IARC Research Training and Fellowship Programme is a fantastic opportunity for early career scientists to assemble complementary skills in preparation for a high-level scientific career.



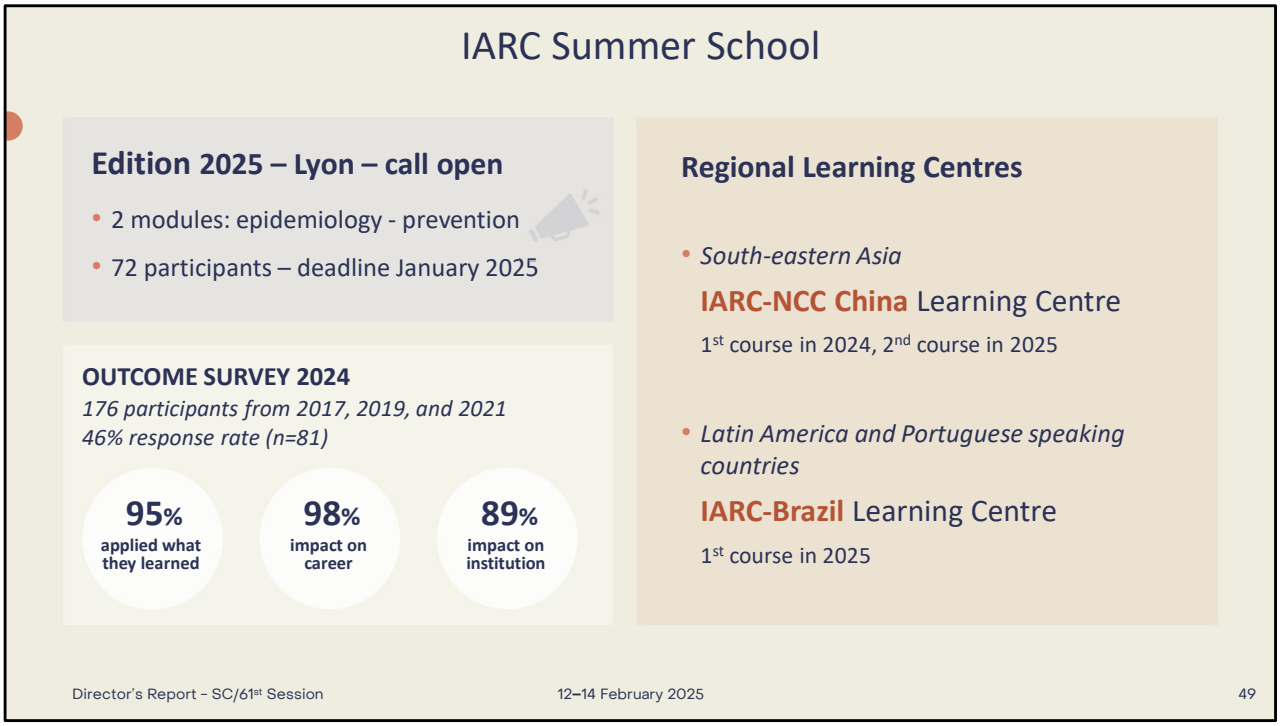
LCB Branch

The next call for IARC Fellowships has been postponed to March 2025, as its scope may vary according to the outcome of a grant application to EU.

We are currently working with the Mark Foundation for Cancer Research to renew its commitment to the programme, with one fellowship supported.

A new partnership with the Instituto de Salud Carlos III in Spain will allow us to include in the call 2 dedicated fellowships targeting early career scientists from Spain, with a 2 year return grant in the country.

Finally, Wallonie-Bruxelles International will allocate, through their current call, 2 postdoctoral fellowships of 2 years each at IARC. These will target students/scientists from Wallonie's universities (Belgium or of different nationality).



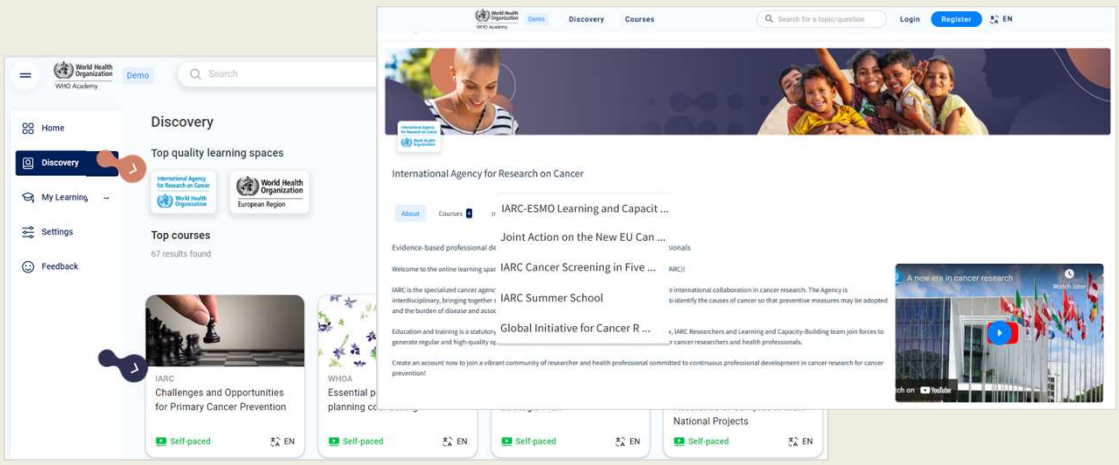
LCB Branch

The Summer School, held biennially, currently consists of two modules:

- Introduction to cancer epidemiology: This module focuses on the practical application of epidemiological principles to cancer control, the search for cancer causes, and the evaluation of control programmes.
- Implementing cancer prevention and early detection: This module covers cancer control strategies, risk factors, prevention approaches, and the principles of screening programmes.

The call for the 2025 edition was open until January.

The IARC Learning Space on the WHO Academy Learning Experience System



https://web-staging.lxp.academy.who.int/partners/IARC

LCB Branch

The IARC Learning and Capacity Building Branch and the WHO Academy team in charge of developing the Academy's Learning Experience Platform (LXP) have been collaborating closely since October 2023. IARC has provided extensive inputs on functionalities that are instrumental to the implementation of IARC courses. The WHO Academy team has successfully implemented most of these functionalities in the LXP.

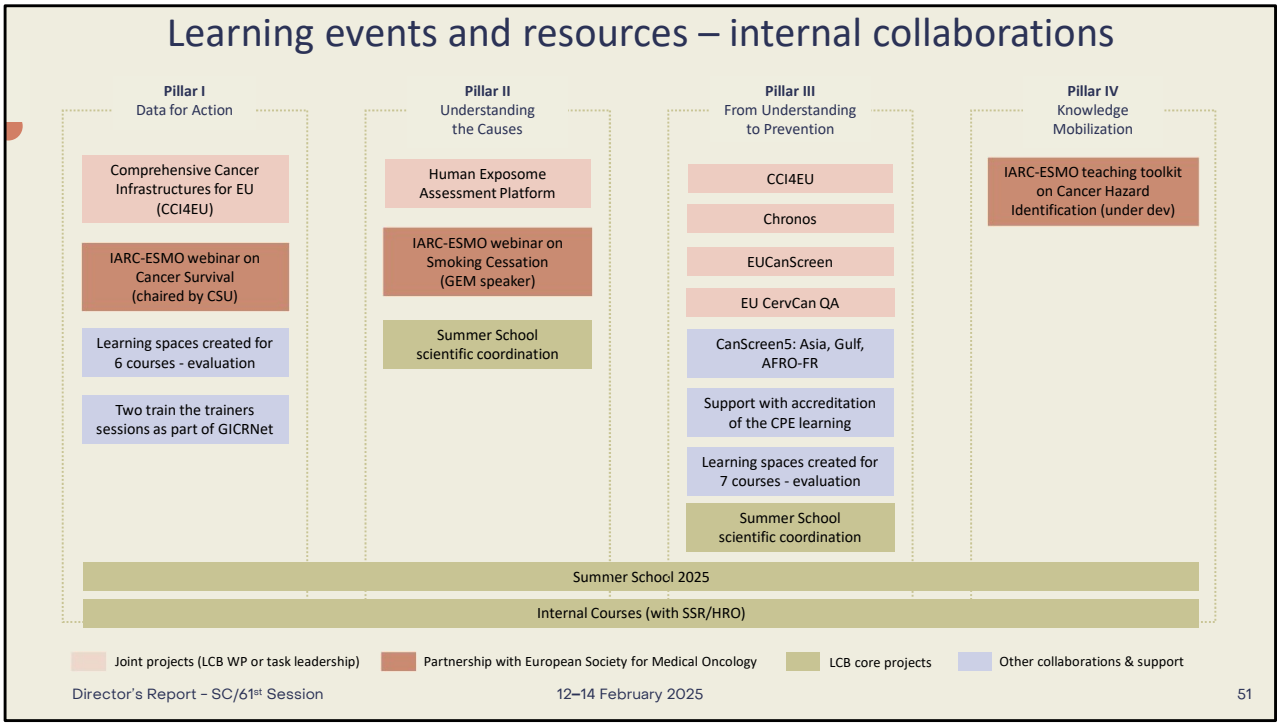
A dedicate learning space was designed for IARC to be able to autonomously create and manage its own courses. From the user's perspective, the IARC learning space is clearly visible and accessible from the LXP "course discovery" page. Users can easily identify the IARC courses in the list of all courses displayed.

CLICK

The IARC Learning Space includes Initiatives, which allow us to compile on a single page the resources that have been developed in the frame of a specific project, and to give the necessary acknowledgement and visibility to project's contributor(s).

(Note: to be updated around beg-January for actual presentation)

As of today, IARC has migrated 22 courses from its former platform to the WHO Academy's learning experience system. The migration of the IARC Learning users is planned for the beginning of 2025.



<u>LCB Branch</u>

LCB was involved in most learning activities led by scientific Branches in different ways: advice or support on learning needs assessment, instructional design, organization, development of online evaluation surveys and/or through the development of online spaces on the learning infrastructure.

LCB has also contributed to Branches' initiatives where there is a training component embedded within a broader project and has collaborated with scientific Branches for the development of proposals and running of projects.

Examples of such joint projects include the following:

- The Human Exposome Assessment Platform (HEAP). LCB and NME/LSB Branches are leading the Education and Dissemination work package.
- Comprehensive Cancer Infrastructures for Europe (CCI4EU). Together with the EPR and CSU Branches, LCB is co-leading IARC's contribution, namely: define maturity criteria for comprehensive cancer infrastructures, specifically as far as screening and population-based cancer registration are concerned; carry out tailored interventions in selected countries; develop an online resource centre gathering

capacity building interventions. LCB is specifically leading the last activity.

- The HPV Vaccine Effectiveness Coordination Center (CHRONOS). This five-year project funded by Bill & Melinda Gates Foundation that started in October 2023, under the coordination of the IARC EPR Branch. LCB is leading the development and implementation of the training strategy of the project.

The following slides report some highlights from the meeting of the **66th Session of the Governing Council** held in Lyon on 15-16 May 2024.

Meeting of the 66th Session of the
IARC Governing Council
IARC, France, 15-16 May 2024

International Agency for Research on Cancer

World Health Organization

Admission of two new Participating States
The Kingdom of Saudi Arabia (28th) and Egypt (29th)

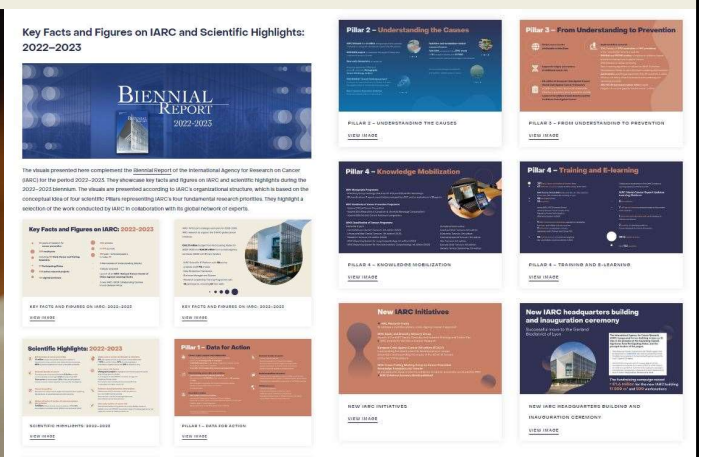
16 May 2024, IARC

IARC welcomed the Kingdom of Saudi Arabia (KSA) and Egypt as its 28th and 29th Participating State respectively, highlighting KSA and Egypt's dedication to advancing cancer research and prevention efforts.

Biennial Report and Director's Report

The Governing Council,

- EXPRESSED its satisfaction with the work accomplished; and
- COMMENDED the Director and her staff on the **Biennial Report 2022–2023** and on the **Director's Report.**



Request for use of funds from the Governing Council Special Fund – Temporary increase in the level of the working capital fund

The Governing Council,

- ❑ AUTHORIZED the Director to effect a one-time transfer of €4 200 000 from the Governing Council Special Fund to the Working Capital Fund;
- ❑ REQUESTED the Secretariat to use the Working Capital Fund to manage short-term cash deficits;
- ❑ REQUESTED that payment of the arrears be paid into the Governing Council Special Fund.

Evaluability assessment of the IARC Medium-Term Strategy (MTS) 2021–2025 and establishment of a Working Group

The Governing Council,

- ❑ APPROVED the proposed workplan and process for the evaluation of the MTS 2021–2025;
- ❑ ESTABLISHED a Working Group for the purpose of preparing the MTS 2021–2025 evaluation, composed of **two members of the Scientific Council** (Dr Pål Romundstad and Dr Luis Felipe Ribeiro Pinto), **two members of the Governing Council** and a **representative from the World Health Organization**;
- ❑ NOMINATED **two Governing Council representatives from France and Spain**, to be part of the Working Group; and
- ❑ REQUESTED the Director to submit the Evaluation Report of the IARC Medium-Term Strategy for 2021–2025 for review by the Scientific Council at its **61st Session in February 2025** and approval by the Governing Council at its **67th Session in May 2025**.

Preparation of the IARC Medium-Term Strategy (MTS) 2026–2030 and establishment of a Working Group

The Governing Council,

- ❑ APPROVED the proposed timeline for the preparation of the MTS 2026–2030;
- ❑ ESTABLISHED a **Working Group** for the purpose of preparing the new IARC MTS for 2026–2030, composed of **two members of the Scientific Council** (Dr Mohamed Berraho and Dr Satish Gopal), **three members of the Governing Council** and a **representative from the World Health Organization**;
- ❑ NOMINATED the three respective Governing Council representatives from **Brazil, Egypt and Saudi Arabia**, to be part of the Working Group; and
- ❑ REQUESTED the Director to submit the IARC Medium-Term Strategy 2026–2030 for review by the Scientific Council at its **62nd Session in February 2026** and adoption by the Governing Council at its **68th Session in May 2026**.

Working Group on sustainable financing of IARC

The Governing Council,

- ❑ ESTABLISHED a **Working Group on sustainable financing of IARC**, composed of **four members of the Governing Council** and **a representative from the World Health Organization**, and supported by such members of the Secretariat as are designated by the IARC Director;
- ❑ NOMINATED the Governing Council representatives from **Canada, Italy, the Russian Federation and the United States of America**, to be part of the Working Group; and
- ❑ REQUESTED the Director to report back to the Governing Council at its **67th Session in May 2025** on the recommendations of the Working Group.

IARC'S COVID-19 and cancer initiative

The Governing Council,

- ❑ THANKED the Secretariat for the update on this initiative, noting the new name as now being "**IARC-IRCC: Initiative for Resilience in Cancer Control**";
- ❑ THANKED **Australia** and the **United Kingdom of Great Britain and Northern Ireland** for their voluntary contributions to support funding for this initiative; and
- ❑ REQUESTED **regular updates** to the Governing Council by the IARC Secretariat on progress throughout the term of the initiative.

Update on the Nouveau Centre building and resource mobilization

The Governing Council,

- ❑ CONGRATULATED the Secretariat for a successful completion of the move to the new building and conclusion of the related fund-raising campaign;
- ❑ NOTED that **close follow-up with the Metropole de Lyon**, as the owner of the building, is still required as there remain several malfunctions under the responsibility of the Metropole de Lyon and falling under the extended warranty;
- ❑ THANKED **Germany** for their voluntary contribution to support funding for new laboratory equipment;
- ❑ ENCOURAGED Participating States to make voluntary contributions and provide support to the resource mobilization efforts towards **new equipment for the Biobank.**

Governing Council Working Group to examine IARC infrastructure projects

The Governing Council,

- ❑ NOTED that the work of the Working Group to examine IARC infrastructure projects has been **duly accomplished** and that, with the move to the Nouveau Centre building, **it is no longer required**;
- ❑ DECIDED to **discontinue the Working Group** to examine IARC infrastructure projects; and
- ❑ THANKED the members of the Working Group, in particular Canada, France, Germany and Switzerland, for their work and longstanding support.

IARC Biennial Report on publication activities 2022–2023

The Governing Council,

- ❑ NOTED the Report with great interest;
- ❑ NOTED that the net revenue to the Governing Council Special Fund from the sale of IARC publications amounted to **€2 172 648 in 2022** and **€2 286 521 in 2023**, of which **75% was allocated in the following years respectively to the publication programme**.

Acceptance of grants, contracts and donations

- The Governing Council,
  - ❑ CONFIRMED the provisional approval given by the Governing Council Chair for the following projects:
    a. **European Cervical Screening Quality Assurance Update** [European Commission European Health And Digital Executive Agency: EU4H, in an amount of €1 080 000.00 for 36 months]
    b. **HPV Vaccine Effectiveness Coordination Center** [Bill & Melinda Gates Foundation, in an amount of €3 213 228.93 for 60 months];
    c. **Cancer in Children – Epidemiology, Registration, Omics** [Ministry of Health, Welfare and Sport of Netherlands, in an amount of €1 535 055 for 36 months]
  - ❑ COMMENDED the staff on its success in winning competitive research grants.
  - ❑ NOTED that the Director allocated €80 000 in 2023 from the Special Account for Undesignated Contributions for the **Postdoctoral Fellowship programme**.

IARC 60th Anniversary

The Governing Council,

- ❑ NOTED with great interest the proposal for celebrating the 60th anniversary of IARC; and
- ❑ ENDORSED the **one-year campaign** culminating in the Scientific Conference to celebrate the 60th anniversary.

Appointment of new members of the Scientific Council

The Governing Council,

- ❑ APPOINTED

Professor Adam Grant Elshaug, Australia
Professor Eric Van Cutsem, Belgium
Professor Hesham Elghazaly, Egypt
Professor Tatsuhiro Shibata, Japan
Dr Ali Saeed Al-Zahrani, Kingdom of Saudi Arabia
Dr María José Sánchez Pérez, Spain
Professor Richard Sullivan, United Kingdom

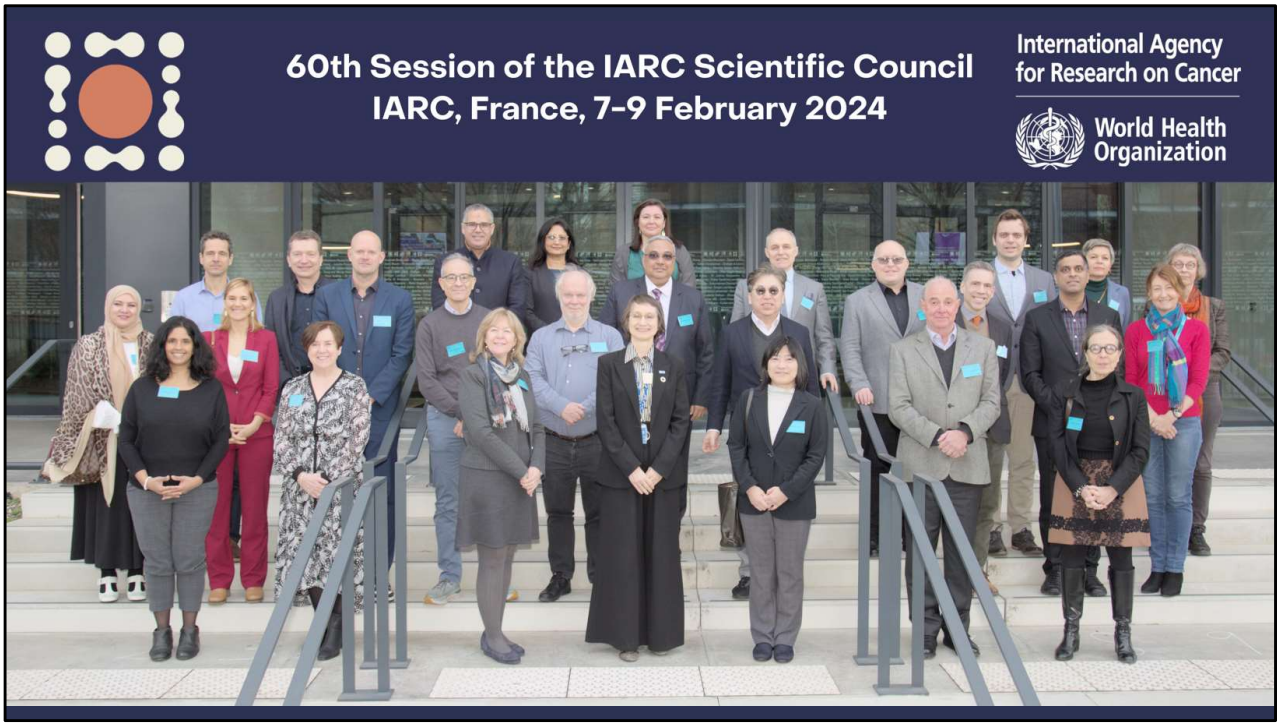
} to serve for four years on the Scientific Council

- ❑ THANKED the outgoing members of the Scientific Council, **Drs Louisa Gordon** (Australia), **Marc Arbyn** (Belgium), **Manami Inoue** (Japan), **Ferrán Catalá** (Spain) and **Kalipso Chalkidou** (United Kingdom) for their valuable work in the Scientific Council.

Date of the sixty-seventh session of the Governing Council

- The Governing Council,
  - ❑ DECIDED to hold its next regular session in Lyon, France, **on 6–8 May 2025**, within the **two weeks preceding the opening of the World Health Assembly in 2025**.

The following slides report some highlights from the **60th session of the Scientific Council** held at IARC on 7-9 February 2024.


60th Session of the IARC Scientific Council
IARC, France, 7-9 February 2024
International Agency for Research on Cancer
World Health Organization

Director's Report: Biennial Report 2022–2023

- The Scientific Council congratulated the Director and her staff on the IARC Biennial Report 2022–2023

https://publications.iarc.who.int/633

Director's response to NME Branch Review (2023)

- The Director noted with great satisfaction **NME's outstanding overall evaluation**.
- The Scientific Council appreciated the efforts of the NME Branch to address the recommendations.

Discussion on the evaluability assessment of the IARC Medium-Term Strategy (MTS) 2021–2025 and its Working Group membership

- A dedicated **Working Group** will review the draft report on the **evaluation of the MTS 2021–2025** and provide its recommendations to the Scientific Council in **February 2025** and to the Governing Council in **May 2025.**
- The Scientific Council nominated **Pål Richard Romundstad** and **Luis Felipe Ribeiro Pinto** to be part of the Working Group.

Preparation of the MTS 2026–2030 and its Advisory Group membership

- The preparation of the **MTS 2026–2030** will rely on a process of consultation beginning during the Governing Council in May 2024. The development of the new MTS will run in parallel with the MTS 2021–2025 evaluation to better consider and integrate its conclusions and recommendations.
- A dedicated **Advisory Group** will review the report on the **MTS 2026–2030** and provide its recommendations to the Scientific Council in **February 2026** and to the Governing Council in **May 2026.**
- The Scientific Council nominated **Satish Gopal** and **Louisa Gordon** to be part of the Joint GC/SC & WHO/HQ MTS Advisory Group for the development of the MTS 2026–2030.

Biennial Report on IARC Education and training activities

- The Scientific Council congratulated the Director and her staff on the IARC Biennial Report on Education and Training.
- The Scientific Council inquired whether additional training on **diversity and equity, open science, and sustainability** should be considered.
- The Scientific Council raised the importance of establishing an **active alumni network**, especially considering many scientists trained at IARC are now in Low- and Middle-Income Countries (LMICs).

Scientific Council feedback about flash talks

- **Excellent feedback!** The Scientific Council congratulated the Director and her staff on the flash talks:
  - Excellent overview from Branch Heads/high quality videos
  - Relevant selection of presentations
  - Excellent to outstanding presentations from scientists and scientific staff/high scientific quality/Homogenised presentations
  - Diversity of backgrounds highly appreciated
  - Alignment with MTS very high
  - Good collaboration across Branches/high collaboration with external partners
  - Catalyst/unique role of IARC in LMICs demonstrated
  - High to very high anticipated public health impact/support to WHO Global Initiatives
  - Very cooperative atmosphere
- **Suggestion for next year flash-talks session (SC/61, February 2025):**
  - Given that SC/61 will be held remotely, the Secretariat suggests that flash-talks be held online, **early December 2024**, as was done in the past for sessions of the Scientific Council held fully remotely:
    - Overview of Branch activities by Branch Heads (5-min video)
    - 5 flash talks per Branch

Update on data science activities – including scientific IT platform

- The Scientific Council congratulated the Director and her staff on the update on data science activities.
- The scientific Council **supported the plan for the next phase of development** of the Scientific IT platform, and looked forward to future such updates on a biennial basis.
- The Scientific Committee made several observations to be considered regarding the development of the Scientific IT platform and related cybersecurity concerns:

✓ **Support for Platform Development**
✓ **Cybersecurity Measures**
✓ **Resource Needs**
✓ **Data Sharing Hub**
✓ **Open AI Systems**
✓ **Dynamic Patient Consent**

Discussion on the report on IARC's vision for open science

- The Scientific Council congratulated the Director and her staff for the report on open science.
- **Comments/Recommendations:**
- Overall, the Scientific Council emphasized the importance of **accessibility, openness, funding, data sharing,** and re-evaluation of traditional metrics to enhance the impact of cancer research publications.

Scientific Council membership of 2025 Review Panel: Epigenomics and Mechanisms (EGM) Branch

Co-Chairs: Walter Berger (Austria) and David Gisselsson Nord (Sweden)

Member:

Orla Sheils (Ireland)

Scientific Council membership of 2025 Review Panel: Early Detection, Prevention and Infections (EPR) Branch

Chair: Satish Gopal (USA)

Members:

Sirpa Heinävaara (Finland)

Young-Woo Kim (Republic ok Korea)

Update on the COVID-19 and cancer initiative

- The Scientific Council congratulated IARC on its progress to date in this area.
- Comments/recommendations on:

✓ **Rebranding Initiative**

✓ **Dissemination Strategy**

✓ **Attention to Essential Service Interruption**

✓ **Positive COVID Findings Integration**

Dissemination and communication strategy “celebrating 60 years of IARC’s research”

- IARC is embarking on a new journey by creating a year-long campaign to celebrate its **60th anniversary** that will culminate in the organization of a **Grand Scientific Conference in May 2026**.
- Comments/recommendations on:

✓ Engage youth.
✓ Dissemination Beyond Scientific Community.
✓ Promotional Campaigns and Ambassadors.
✓ Distinguish from Governments.
✓ Learn from National Cancer Institute.
✓ Power of Storytelling.
✓ Increase Visibility.
✓ Sustainability and Goal Definition.

Scientific report of the Evidence Synthesis and Classification (ESC) Branch Review

IARC ESC Branch

IARC Handbooks Programme (IHB)

IARC Monographs Programme (IMO)

IARC WHO Classification of Tumours series Programme (WCT)

Assessment of ESC's scientific quality

- ESC's past performance: **Outstanding**
- ESC's future plans: **Outstanding**

Assessment of the relevance of ESC's work to the mission of IARC

- ESC's past performance: **Perfect fit**
- ESC's future plans: **Perfect fit**

Election of Chair and Vice-chair for the 61st session of the Scientific Council – date of next session-

Dr **Luis Felipe Ribeiro Pinto** was elected Chairperson.

Dr **Sirpa Heinävaara** was elected Vice-Chairperson.

The 61st session of the Scientific Council will take place on:

Wednesday 12, Thursday 13 and Friday 14 February 2025

The meeting will be held remotely.

Thank you

International Agency for Research on Cancer

World Health Organization

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