IARC Impact in practice series
The United-States experience

> ***"The US has an extremely well-developed cancer research ecosystem and IARC's research is fully integrated with that ecosystem, across every Branch and Pillar."***
> **Dr Mary Schubauer-Berigan, IARC Liaison Officer for the US**

Since helping to found IARC in **1965**, the United States has used the Agency as a strategic lever to turn global evidence into practical action on **prevention, screening, regulation and diagnosis**, while ensuring US science helps shape international standards. Membership gives the US both **influence and reach**: influence through governance, expert participation and long-term support to flagship programmes; reach through access to multinational research platforms, pooled datasets and independent evidence that no single country could assemble alone.

Why IARC membership made the difference for the United States:

- **Scale where it matters:** Over the past decade, US researchers co-authored 1,558 publications with IARC, making the United States one of IARC's most active Participating States. These papers arise from large international consortia (median 15 institutions per paper, versus 3 in other US oncology papers) and connect 2,731 institutions across 180 countries. They anchor US teams in data-intensive fields where scale is essential, including GWAS, screening and early detection, HPV and cervical cancer, metabolomics, infection-related cancers, and occupational and environmental risks.
- **Evidence government and health systems can act on:** US-backed IARC programmes - notably the *IARC Monographs, IARC Handbooks* and WHO Classification of Tumours - support federal and state action on carcinogenic exposures, worker protection, prevention policies, screening design and diagnostic consistency. Large-scale US-linked studies such as INWORKS, OPICO, equity-focused work on lung-cancer screening, and analyses of infection-attributable cancers among adults with HIV in the US provide independent, policy-ready evidence for standards, programme design and public-health reform.
- **Benchmarking that drives improvement:** Through IARC, US experts and institutions contribute to GLOBOCAN, NCD Countdown 2030, the Global Initiative for Cancer Registry Development (GICR), and CanScreen5, enabling fair comparison of cancer burden, premature NCD mortality, registry quality and screening performance with peer countries. This benchmarking helps identify gaps in early diagnosis, outcomes and equity, and gives US agencies credible international reference points for targeting improvement.
- **Standards and capability that stay in the US:** The United States has built lasting national expertise through IARC-linked training, leadership and standard-setting: at least 35 US IARC fellows historically, 23 trainees in 2021–2025, and strong US participation in the *IARC Monographs, IARC Handbooks* and WHO Classification of Tumours editorial boards.

Part I. Scientific leadership through international collaboration

Exceptional intensity and depth of collaboration

The United States' partnership with IARC is a deeply integrated collaboration that places US institutions at the core of large, multi-country cancer epidemiology initiatives, where global scale and standardised methods are essential for credible, policy-relevant evidence. Over the past decade, US researchers have produced **1,558 oncology publications co-authored with IARC, making the United States one of the most active IARC Participating States in terms of joint publications**[1]. The depth of integration is striking: IARC-linked US publications involve a **median of 15 institutions per paper, compared with 3 for US oncology publications without IARC participation**. Overall, collaborations span **2,731 institutions across 180 countries**, connecting US teams to a truly global research network that would be extremely difficult to assemble through national mechanisms alone.

[1] Data derived from Web of Science records of IARC–US co-authored papers published between January 2016 and January 2026.

Web of Science Micro-topic analysis shows that US–IARC outputs are concentrated in high-impact, data-intensive fields that mirror shared priorities on prevention, equity, and environmental risk, including:

- **Genome-wide association studies and related genomic susceptibility research**, across major cancer sites;
- **Screening disparities and early detection**, including work on lung cancer, colonoscopy, and disease mapping;
- **HPV and cervical cancer prevention**, spanning vaccine effectiveness, screening technologies, and implementation;
- **Nutrition, obesity and metabolic risk**, including metabolomics, metabolic syndrome and fatty-acid pathways;
- **Genetic testing and molecular markers**, from polygenic risk scores to telomere and microsatellite instability studies;
- **Occupational and environmental risk factors**, such as asbestos–mesothelioma, ionizing radiation, genotoxicity, smoking cessation, alcohol, and other lifestyle-related risks.

Cancer in the United-States: a high-income burden with opportunities for prevention

Based on recent GLOBOCAN 2022 estimates, cancer is a major public health challenge in the United States, with around **2.38 million new cases** and **606,000 deaths** each year. Incidence levels are high and typical of high-income countries, reflecting population ageing and continued exposure to modifiable risk factors such as **tobacco use, alcohol, excess body weight, unhealthy diet and physical inactivity**. Although survival has improved thanks to strong specialist services and widespread use of screening and early detection, cancer remains **one of the leading causes of premature mortality** in the country. The United States is also facing growing concern over early-onset colorectal cancer, and other cancers increasingly affecting younger adults, highlighting the need to strengthen prevention and early detection well before older age

This points to substantial untapped potential to **prevent cancer and diagnose it earlier**, particularly through intensified tobacco and obesity control, HPV vaccination, and equitable access to high-quality screening and treatment.

➔ Leadership in global research infrastructure

Through IARC, **US institutions and funders have supported more than 110 US-funded projects over the past decade (2016–2026), while at least 278 US collaborators have participated in IARC projects overall, including many beyond those directly funded by US sources**, making the United States a major driver of IARC's global research infrastructure. Examples include:

- **Quantifying risks from environmental and occupational exposures**: US investigators from the **National Institute for Occupational Safety and Health** and worker cohorts are central to **INWORKS**, the long-term study of nuclear workers in France, the United Kingdom and the United States and **PUMA**, the pooled international uranium miners analysis, with direct implications for US occupational standards and compensation schemes (see Box #2). Complementary **National Cancer Institute (NCI)** and **National Institute of Environmental Health Sciences (NIEHS)** funded projects examine **perfluorooctanoic acid (PFOA) and renal cancer**, the effects of **methoxsalen (PUVA) therapy** on kidney cancer, and other high-priority exposures, feeding into the ***IARC Monographs*** evaluations.
- **Global HPV vaccination and cervical-cancer elimination platforms**: US-based funders (notably the **Gates Foundation, Good Ventures, American Cancer Society, PATH, RTI International** and others) support a portfolio of IARC-coordinated trials and follow-up studies, including: extended follow-up of the **IARC–India HPV vaccination trial**; single-dose impact and effectiveness studies in **Armenia, Uganda and Zambia**; validation of **indigenous HPV tests (iHPV)**; spectroscopy to detect **urinary HPV**; and development of **E6/E7 oncoprotein assays**. National Iinstitutes of Health (NIH) funded projects add innovations such as **portable thermo-coagulators** and a **one-stop, AI-assisted screening and triage system** for cervical cancer (the **EASTER** and related projects). Together these platforms underpin WHO guidance and inform US and global efforts to accelerate cervical-cancer elimination.

> ***"We bring the world together to tackle some of the most pressing challenges in understanding the causes of cancer, how to prevent cancer or how to classify tumors. IARC a hub and a central nexus for synthesizing that evidence. You can't get it in any individual country."***
>
> **Dr Mary Schubauer-Berigan**
> **IARC Liaison Officer for the US**

- **Screening, early detection and risk prediction**: IARC works with US partners and funders including **NCI, the Lung Cancer Research Foundation, the International Association for the Study of Lung Cancer (IASLC), and others** on biomarker-informed early detection. Flagship projects include the **Lung EArly Proteins (LEAP) project** on blood proteomic markers before lung cancer diagnosis, and development and validation of **risk prediction models to ensure equitable eligibility for lung cancer screening in minority populations and people who never smoked**. Parallel initiatives address oral cavity and **head-and-neck cancers** through natural-history models, cost-

effectiveness analyses of oral cancer screening, and studies of **germline and somatic mutations** across diverse US and international populations. In the United States, where HPV type 16 is estimated to account for about 70% of oropharyngeal cancers, this work is especially important for strengthening early detection in cohorts that did not benefit from HPV vaccination.

- **Biobanks, large cohorts and pooled consortia**: US institutions host key nodes of IARC-linked infrastructures such as the **Data Coordination Center of the Childhood Cancer and Leukemia International Consortium (CLIC)** and a **multi-national nutritional biobanking programme in paediatric oncology**. US universities and cancer centers participate in, and often co-lead, major pooled analyses including the **Pooling Project of Prospective Studies of Diet and Cancer**, multicentre studies of **alcohol use and cancer**, the **Opioid Cohort Consortium (OPICO)**, the **InterLymph** consortium on haematological malignancies, and GWAS and metabolomics studies of **renal, liver, pancreatic, thyroid, breast and colorectal cancers**, **as well as cutting-edge molecular characterisation of neuroendocrine tumours, including supra-carcinoids and related lung NET subtypes.** These infrastructures allow US cohorts and biobanks to be embedded in pooled datasets of a size and diversity that no single country could assemble alone.
- **Global cancer registries, surveillance and screening quality**: With support from **NCI, Center for Disease Control (CDC), Vital Strategies, St Jude Children's Research Hospital, the American Cancer Society (ACS), CRDF Global, Sabin Vaccine Institute and the World Health Organization/Pan American Health Organization (WHO/PAHO)**, IARC coordinates the **Global Initiative for Cancer Registry Development (GICR)**, multiple rounds of **"Supporting Population-Based Cancer Registries"** grants, and **CanScreen5** master-trainer courses in Africa, Asia and the Americas. These efforts improve data quality and programme performance in low- and middle-income countries, while providing comparative evidence that helps benchmark US outcomes and identify best practices.
- **Independent hazard identification, prevention guidance and methods**: The NIH and other partners provide long-term support for the ***IARC Monographs*** and the ***IARC Handbooks of Cancer Prevention***, including recent volumes on carcinogenic chemicals (such as PFAS), occupational exposures, alcohol, and cancer-prevention interventions. A dedicated NCI-funded project has developed a **toolkit for bias impact assessment in observational epidemiology studies** used in hazard identification, now incorporated into **Statistical Methods in Cancer Research, Volume V**. These programmes set global reference standards that are heavily used by US regulators and guideline bodies.
- **Equity and outcomes in global cancer control**: Projects such as **African Breast Cancer – Disparities in Outcomes (ABC-DO and ABC-DO-Plus)**, studies of **metastatic breast cancer disparities**, and international analyses of **pancreatic cancer burden attributable to key risk factors** use IARC platforms to examine inequities in cancer risk and outcomes across and within countries, including US minority populations, and extending to rarer but high-impact areas such as Fusobacterium-associated colorectal cancer and HPV-independent penile neoplasia.

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➔ Shaping the global cancer research agenda and standards

American experts and diplomats help steer IARC's direction. Through seats on the **Scientific Council and Governing Council**, and active involvement in developing the Medium-Term Strategy (MTS), the United States contributes directly to setting IARC's research and capacity-

Box #2: INWORKS: turning US worker data into global evidence on radiation risks

INWORKS (the International Nuclear Workers Study) is a flagship example of the added value of US participation in IARC. Coordinated by IARC, the study brings together detailed badge-dosimetry records and long-term follow-up for more than **300 000 nuclear workers** in **France, the United Kingdom and the United States**, representing over **10 million person-years of observation**.

The US contribution is central. Workers employed by the **Department of Energy and related facilities** account for a substantial share of the cohort, person-years and cancer deaths, while US agencies such as the **National Institute for Occupational Safety and Health (NIOSH)** and the **National Cancer Institute (NCI)** are key scientific and funding partners. By pooling these data under a single IARC protocol, INWORKS has achieved something no national study could do alone: it has produced the most authoritative evidence to date on the cancer risks associated with **protracted low-dose ionizing radiation**. Its findings show that even long-term, low-dose occupational exposures are linked to excess deaths from **solid cancers and haematological malignancies, including leukaemia, lymphoma and multiple myeloma**.

Through IARC, US worker data are transformed into **independent, internationally recognised evidence** that informs **radiation-protection standards, worker-safety rules, compensation schemes, emergency planning and long-term risk assessment**.

building priorities. This high-level engagement is a form of **soft power**. By shaping IARC's work programme, the United States brings national and regional realities into global decision-making while gaining early insight into emerging priorities, methods, and partnership opportunities, aligning its own cancer plans and investments with cutting-edge international evidence. This agenda-setting role also plays out in emerging fields: at the inaugural Exposome Moonshot Forum in Washington, DC, IARC showcased its Human Exposome platforms, reinforcing US–EU collaboration on how to measure environmental exposures across the life course and helping shape a research agenda of growing relevance for cancer prevention.

The United-States also play a central role in developing widely respected **international evidence frameworks and classification standards** that shape global cancer science, prevention, and regulation. During the 2020-2025 cycle, 140 American experts have contributed to the IARC's flagship evaluations, including:

- **IARC Monographs Volume 126:** *Opium consumption*
- **IARC Monographs Volume 127:** *Some aromatic amines and related compounds*
- **IARC Monographs Volume 128:** *Acrolein, Crotonaldehyde, and Arecoline*
- **IARC Monographs Volume 129:** *Gentian violet, leucogentian violet, malachite green, leucomalachite green, and CI direct blue 218*
- **IARC Monographs Volume 130:** *Hydrazobenzene, N-Methylolacrylamide, Diphenylamine, and Isophorone*
- **IARC Monographs Volume 131:** *Cobalt, antimony compounds, and weapons-grade tungsten alloy*
- **IARC Monographs Volume 132:** *Occupational exposure as a firefighter*
- **IARC Monographs Volume 133:** *Anthracene, 2-bromopropane, butyl methacrylate, and dimethyl hydrogen phosphite*
- **IARC Monographs Volume 134:** *Aspartame, methyleugenol, and isoeugenol*
- **IARC Monographs Volume 135:** *Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS)*
- **IARC Monographs Volume 136:** *Talc and Acrylonitrile*
- **IARC Monographs Volume 137:** *Hydrochlorothiazide, voriconazole, and tacrolimus*
- **IARC Monographs Volume 138:** *Automotive gasoline and some oxygenated gasoline additives*
- **IARC Monographs Volume 139:** *Hepatitis D virus, human cytomegalovirus, and Merkel cell polyomavirus*
- **IARC Monographs Volume 140:** *Atrazine, alachlor, and vinclozolin*
- **IARC Handbooks of Cancer Prevention Volume 18:** *Cervical cancer screening*
- **IARC Handbooks of Cancer Prevention Volume 19:** *Oral cancer prevention strategies, including risk-factor reduction and early detection*
- **IARC Handbooks of Cancer Prevention Volume 20A:** *Reduction or cessation of alcoholic beverage consumption and cancer risk*
- **IARC Handbooks of Cancer Prevention Volume 20B:** *Alcohol policies*
- **IARC Handbooks of Cancer Prevention Volume 21:** *Lung cancer screening and early detection approaches*
- **World Health Organization Classification of Tumours (Blue Books) 5th and 6th editions:** Extensive editorial board, expert panel, and reporting-system contributions supporting international tumour classification standards, diagnostic criteria, and reporting systems across multiple organ systems.

Part II. From evidence to action: IARC's impact on national Public Health

> ***"I think IARC does a terrific job, independent and objective, and has a very strong reputation for providing high-quality data that we rely on."***
>
> **Prof Kathleen Schmeler**
> **MD Anderson Cancer Center**

➔ Evidence that informs national regulation and prevention policy

In the United States, IARC-linked evidence is routinely pulled into **regulatory assessments, product standards, cancer-control plans and risk-communication materials** produced by federal and state agencies, national institutes and major think tanks. An Overton analysis of US public-sector documents (2005–2026) identifies **2,386 documents** that explicitly cite IARC-authored studies or evaluations, of which about **1,530 are produced by government bodies and over 830 by US think tanks**. This volume of use places the United States **among the countries that cite IARC most frequently in policy documents worldwide**. Across this corpus, IARC outputs are used to:

- **Underpin environmental and chemical regulation:** The US Environmental Protection Agency (EPA) and several state agencies use the *IARC Monographs* and related IARC-led syntheses when assessing carcinogenic hazards from air pollutants, drinking-water contaminants and industrial chemicals. These evaluations help identify which agents are carcinogenic, frame dose-response judgements and inform proposed standards or clean-up levels.
- **Support drug and product safety standards:** The Food and Drug Administration (FDA) guidance on nitrosamine impurities in medicines and tobacco-control materials on the carcinogenicity of smokeless tobacco and other constituents explicitly cite the *IARC Monographs* to explain which agents are known or probable human carcinogens and why limits or warnings are warranted.

- **Inform federal cancer-control and prevention strategies:** NCI materials and grant justifications reference *the IARC Monographs and IARC Handbooks* as the international benchmark for hazard identification and prevention evidence, particularly for alcohol, HPV-related cancers, tobacco and screening interventions, linking research portfolios to an independent global standard.
- **Guide HIV and infection-related cancer policy:** Centers for Disease Control and Prevention (CDC) guidance for the prevention and treatment of opportunistic infections in adults and adolescents with HIV cites IARC-linked work on HPV burden, vaccine impact and infection-related cancers, showing how IARC evidence feeds into prevention policy at the intersection of cancer and infectious disease.
- **Provide a common reference for occupational and environmental health:** CDC and NIOSH technical documents use the *IARC Monograph* evaluations as a backbone for identifying priority occupational exposures, defining research needs, and shaping worker-protection guidance.
- **Support diagnostic practice and clinical consistency:** Beyond regulation and prevention policy, US pathologists rely heavily on the **WHO Classification of Tumours** in routine practice, making IARC's tumour-classification work an important tool for diagnostic quality, harmonised reporting and multidisciplinary cancer care in the United States.
- **Provide a common reference across federal and state systems:** IARC evidence appears not only in federal guidance, but also in state cancer plans, legislative and advisory reports, and public-health strategies, showing that its influence extends well beyond specialist regulatory agencies.

Box #2: The *IARC Monographs*: a US-backed global standard with real impact at home

The *IARC Monographs on the Identification of Carcinogenic Hazards to Humans* are one of IARC's flagship programmes and one of the most influential global tools for cancer prevention. For more than 50 years, they have provided independent, transparent and scientifically rigorous evaluations of whether chemicals, occupations, radiation and lifestyle factors cause cancer. As **Dr Mary Schubauer-Berigan, IARC Liaison Officer for the US and Head of *the IARC Monographs* programme**, notes, the United States has been funding or partially funding the Monographs since **1982**, in what has been "a partnership to develop a system of evaluating cancer hazard," and one in which "US investment has really paid off in terms of global impact and also impact in the US."

That investment has translated into practical influence across **regulation, worker protection, public health messaging and compensation programmes**. US agencies use the *IARC Monographs* as a key international reference when assessing carcinogens, and their effects can be seen across a wide range of policies and hazards. In occupational health, IARC evaluations have helped reinforce US standards on **asbestos**, **benzene**, **formaldehyde**, **diesel engine exhaust** **and** **wood dust**; in environmental policy they have informed action on agents such as **arsenic**; and in prevention they have underpinned public education on risks such as **tobacco smoke** and **ultraviolet radiation**.

The impact is especially visible in concrete US policy shifts. After IARC classified **diesel engine exhaust** as carcinogenic to humans, US mine-safety authorities tightened limits on diesel particulate matter in underground metal and non-metal mines, explicitly linking the change to the IARC evaluation. The Monographs have also had longer-running effects in areas such as **asbestos**, where they have helped support workplace standards, abatement requirements, disease recognition and compensation systems.

Beyond the concrete examples highlighted in Box #3 on the impact of the *IARC Monographs*, the analysis also shows how IARC evidence can translate into concrete policy change in other areas: **in 2016, the US Advisory Committee on Immunization Practices (ACIP) changed the national HPV vaccination schedule from three doses to two doses for adolescents who start the series before age 15.** In its Morbidity and Mortality Weekly Report (MMWR) policy report on this update ("Use of a 2-dose schedule for human papillomavirus vaccinatio-Updated recommendations of the Advisory Committee on Immunization Practices"), ACIP explicitly cites the **IARC-coordinated Indian HPV vaccine study** as part of the evidence base underpinning the decision.

➔ **Delivering equitable screening & early detection**

US-IARC collaboration is helping move cancer screening beyond **one-size-fits-all approaches** toward models that are more **targeted, equitable and practical to deliver**. Three strands are especially relevant for current US policy debates.

In **lung cancer**, joint IARC-NCI work shows that simply broadening age and pack-year criteria is not enough to eliminate racial inequities in screening eligibility. Instead, more **risk-based models and structural solutions** are needed to reflect differences in smoking patterns, comorbidities and access to care. This work is reinforced by US-funded IARC projects on **lung-cancer risk prediction and blood-based proteomic biomarkers** (including LEAP and related projects), which aim to improve who gets screened and avoid over-screening those at lower risk.

In **cervical cancer**, the US-backed **EASTER** project is validating two innovations - **urine-based HPV testing and AI-assisted cervical imaging** - to create a one-stop, affordable pathway from screening to treatment decision. Although designed for low-resource settings, these tools are also highly relevant for **hard-to-reach and underserved communities in the United States**, where visit-intensive screening models can widen disparities.

And in **HIV-related cancer prevention**, an IARC-led analysis with **NCI and CDC** found that about **40% of cancers in adults living with HIV in the United States are attributable to infection**, compared with about **4%** in the general population. By identifying the main drivers - including **Kaposi sarcoma, EBV-related lymphomas and HPV-related cancers** - this work provides a clear evidence base for integrating **vaccination, infection control and targeted screening** into HIV care and related public-health programmes.

➔ Shaping the global prevention and NCD agenda

> *"One of the opportunities of IARC's research is to have countries working together, taking the findings and skills from high-income countries to improve cancer research in low-and-middle income countries."*
>
> Prof Kathleen Schmeler
> MD Anderson
> Cancer Center

Beyond individual projects, US-supported IARC work plays a visible role in **framing the global conversation on preventable cancers and non-communicable diseases (NCDs)**, with clear implications for US policy. An IARC-led study with partners in London estimates that **1.9 million cancer deaths every year in the USA, UK and BRICS countries combined are caused by just four modifiable risk factors: tobacco smoking, alcohol use, overweight/obesity and HPV infection**. For the United States, the analysis provides **headline-ready numbers** on lives and years of life lost that could be saved through stronger tobacco control, alcohol policy, obesity prevention and HPV vaccination. It also quantifies the distribution of preventable deaths by cancer site, supporting prioritisation across lung, colorectal, breast, liver and cervical cancers.

In parallel, IARC contributes cancer expertise to **NCD Countdown 2030**, a global collaboration that tracks progress toward **SDG target 3.4 (one-third reduction in premature NCD mortality)**. Every two years, NCD Countdown publishes **country-specific profiles**, including for the USA, showing trends in mortality between ages 30 and 70 from cancer, cardiovascular disease, diabetes and chronic respiratory disease, as well as the rate at which these deaths are declining. These profiles place the United States alongside peer countries, highlighting where it is **on track, lagging or backsliding**, and underscoring that while US mortality from several major cancers is falling, progress is **too slow to meet 2030 targets without stronger prevention and early-detection policies**.

Part III. Building capacity for lasting impact

➔ Training as a gateway to international science

Training and knowledge exchange are also longstanding pillars of the US–IARC relationship. Since the late 1960s, **35 named fellows (between 1967 and 2015)** have been awarded highly competitive IARC Fellowships. This historical investment is now complemented by a **steady flow of trainees**: in the 2021–2025 cycle alone, **23 US trainees** took part in short-and medium-term training attachments at IARC. These fellows and visitors help keep links vibrant between US institutions and IARC teams working on screening and early detection, occupational and environmental carcinogens, tumour classification, and global cancer surveillance. The pipeline is also still evolving. In ESC, IARC is developing a **memorandum of understanding with the University of California, Irvine** to host one PhD student each year for a two-month internship with the Monographs programme. This visibility also reflects a two-way exchange: IARC researchers have been selected for the NCI Division of Cancer Prevention's Early Career Scientist Spotlight seminar series. This engagement is part of IARC's wider capacity-building ecosystem, which includes the Postdoctoral Fellowship Programme, the IARC Summer School, the IARC Learning Platform, and global networks for cancer registries, screening, and biobanking. Together, these initiatives train thousands of professionals worldwide and generate durable benefits: in a 2024 outcome survey, **98% of postdoctoral respondents reported transferable skills, 72% maintained research ties with IARC after training, and over half progressed to leadership roles (53%) or managed independent research funding (52%)**. This creates a **two-way multiplier effect**: expertise gained at IARC is reinvested in national institutions, while the priorities, data, and methodological strengths of participating countries feed back into IARC's networks, helping shape future research, standards, and capacity-building efforts. US partners also help amplify this training role at home. The **NCI Division of Cancer Prevention's Early Career Scientist Spotlight** has featured IARC researchers as invited speakers, showcasing joint work on **screening, biomarkers and prevention trials** and signalling a shared commitment to **nurturing the next generation of cancer-prevention and early-detection experts** on both sides of the Atlantic.