



Newsletter

■ October, 2022



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Advisor Insight

In India the 5-year survival for breast cancer varies hugely between North east India (25%) in comparison to the rest of India (50%). This stark disparity is predominantly due to the lack of breast cancer awareness among the general population, poor availability of and access to public health services, as well as the very low participation in mammography screening programmes or non-availability of the program that leads to delays in diagnosis. This ultimately seriously impacts the treatment outcomes and survival. Due to more aggressive techniques, treatment of BCs discovered at a later stage is also more costly and is linked with increased morbidity. Therefore, it is thought that it is very important to reduce these delays. Health professionals at PHCs, CHCs, and medical colleges are frequently ill-prepared to conduct quality CBEs, making them more likely to ignore breast complaints and overlook early illness, which exacerbates the issue of late presentation. Therefore, apart from awareness to recognize and screen for breast cancer, it is important to upskill and train healthcare professionals at tertiary levels to not only enhance the quality of the approach and their capacity for early breast cancer detection, but also as they are people's initial point of contact with the health system and their relationship with primary care is the strongest. Efforts to enhance breast cancer prevention and early diagnosis at the community level can also be strengthened by upskilling frontline workers such as ASHAs and Anganwadi workers with information that can be disseminated and be used to encourage health literacy.

Further, an equally important aspect in Breast cancer care to obtain optimal outcomes such as cure or improvement in quality of life is treatment adherence and compliance.

Endocrine therapy and chemotherapy are two treatment options for metastatic breast cancer, each of which has a unique profile (e.g., risk of hot flashes vs. fatigue risk, oral vs. intravenous administration, etc.). How patients value the attributes of their medications has an impact on both treatment decisions and adherence. Women with breast cancer may become non-adherent if patient preferences and recommended treatment regimens are out of sync, which might have effects on symptom management and survival. Similar to how continuous communication may encourage patients to adhere to their regimen, counselling and education regarding therapy, including its goal, expected duration, potential roadblocks, and strategies to overcome them, can motivate patients to follow through their regimen. In line with this, reducing inequalities in breast cancer care would also require cost effective treatment guidelines and Strategies to mitigate financial toxicity that patients face. Financial toxicity is influenced by a wide range of variables, including insurance coverage, the presence of a disease, the expense of medical and nonmedical care, and the type of therapy chosen. Out-of-pocket expenses, such as co-payments, over-the-counter drugs and supplies, childcare, transportation, parking, and meals are other elements determining the financial toxicity of cancer. A multidisciplinary approach involving medical professionals, NGOs, the industry, private organization as well as government entities are instrumental in determining how well current therapies are working to alleviate financial toxicity in cancer care and to create novel interventions.



Dr Bhawna Sirohi

Medical Director, BALCO Medical
Centre, Naya Raipur

3rd EDITION OF THE BREAST CANCER ACTION MONTH



IHW Council in collaboration with Novartis and Rapid Global Cancer Alliance organized the 3rd edition of the Breast Cancer Action Month. The initiative saw the participation of policy leaders and experts for a 5 state-level led discussions and a summit with three sessions focusing on reducing inequities in breast cancer treatment, achieving breast cancer health insurance for all, and providing chances for risk-based screening.

Over the past two years, Novartis and IHW Council have successfully identified gaps and barriers to adequate breast cancer care and management; this year through the combination of activities that include a National-Level Summit, and Targeted State-level advocacy that included panel discussions and engagement with government officials of the states Rajasthan, Kerala, Tamil Nadu, West Bengal and Madhya Pradesh, we aimed to scale-up and build a more localised scenario of breast cancer with solutions attuned to the local specificities and experiences.

The day-long virtual Summit featured several stakeholders from the scientific and medical community, industry professionals, breast cancer advocates and champions, and attendees, including basic, clinical, and science-focused researchers, physician scientists, and community members, with an interest in breast cancer research. Some of the notable names were, Dr. Mahendra Munjapara, Hon'ble Minister of State for AYUSH and Minister of State for Woman and Child Development, Dr Heera Lal IAS, Additional Health Mission Director, Government of Uttar Pradesh , Dr GK Rath, Head, National Cancer Institute & Chief, DRBRAIRCH and Professor, Radiation Oncology, AIIMS, New Delhi, Dr Madan Gopal, Senior Consultant Health, NITI Aayog.



Stories of Hope

Dr Neeti Leekha Chhabra, the founder of Yes to Life, is a breast cancer winner who dealt with the disease at the age of 31 with positive attitude and strength. She is a TEDx speaker (Why Me or Wow Me) and an avid writer who writes about life, positivity, and happiness. She left her full time job as a professor to follow her passion to spread awareness and provide support to the people affected by this disease. She has started this NGO with all her heart and soul to serve and help whoever is fighting this dreaded disease. Her vision to reduce mortality rate arising from breast cancer, is her driving force. To quote her “my life after cancer has become much more beautiful and meaningful. I enjoy wind in my hair, every second spent with my son, rain on my hands and every other moment in my life now!! God has been so kind and it’s time to help others now“. Yes to Life is working towards breast cancer awareness, cancer screenings and patient support – financial, emotional and rehabilitation. They run Breast Cancer Center in Sec 45 (Dispensary sec 45) Gurugram, under Public Private Partnership wherein the space has been awarded to them by Health Dpt, Gurugram and all the activities, costing etc. is borne by them. The centre is run for women from lower income group of villages and slums in Gurugram and are supported in the following ways – Free breast cancer OPD every Monday 10am to 12 noon by Dr. Kanchan Kaur (Senior Director, Breast Surgery, Medanta Medicity). The team goes to

villages (including home to home visits) 3-4 days in a week to spread awareness for breast cancer and provide free of cost screenings to these women – ultrasound, mammography, fnac, pet ct etc as per the requirement, treatment support, rehabilitation support - free of cost prosthesis and mastectomy bras, counselling and emotional support. The differentiator for which they are appreciated is that they support the patients during the whole journey of diagnosis to treatment and rehabilitation. As Dr. Neeti says “we don’t believe in telling a patient that you have cancer and then leave her to fend for herself. Our aim is to help through diagnosis to rehabilitation.”

They request all the readers to bring their house helps, cooks, part time maids, staff to the center for breast check up.



Dr Neeti Leekha Chhabra
Founder & President, Yes to Life NGO

National Developments



Policy Insight

- **THEME:** Cancer Burden
- **UPDATE:** Real cancer cases up to 3 times higher than reported in India

Key Highlights

- According to a study by FICCI and EY titled "Call for Action: Making Quality Cancer Care More Accessible and Affordable in India," the actual incidence of cancer in India is thought to be 1.5 to three times higher than the reported incidence. This is because 51% of patients take longer than a week to reach a diagnosis and 46% seek a second opinion due to lack of confidence in the initial diagnosis and recommended treatment.
- The predicted number of cancer cases in India this year is 19 to 20 lakh, while the actual number of cases is 1.5 to 3 times higher. Poor detection contributes to India's high cancer disease burden; just 29%, 15%, and 33% of breast, lung, and cervical cancers, respectively, are detected in stages 1 and 2. Six states, comprising 18% of India's total population, account for 23% of the reported incidence burden and have the highest crude incidence rates in the nation. According to the report, the states with the highest overall crude incidence rates of cancer—more than 130 cases per lakh people—are Kerala, Mizoram, Tamil Nadu, Karnataka, Punjab, and Assam.

- Estimates indicate that the total deaths owing to cancer were 8 to 9 lakh in 2020, causing the mortality to incidence ratio for different cancer types in India to be among the poorest compared to global counterparts.

Policy Insight

■ **THEME:** Cancer Burden

■ **UPDATE:** Breast cancer incidence is second highest in Bengaluru after Chennai

Key Highlights

- In addition to the prevalence of approximately 30,000 instances, the population-based cancer registry for Karnataka estimates that over 9,800 new cases of breast cancer are detected there each year. Bengaluru's incidence of breast cancer, which was the second highest in the nation (after Hyderabad and Chennai) until last year, increased to 40.5 per lakh (age-adjusted rate, or AAR) this year. Chennai has the greatest incidence, at 42.2 per lakh.
- When compared to Bengaluru's AAR of 15 per lakh in 1982, the Population-based Cancer Registry for Karnataka finds a significant rise (PBCR). It is recognised that October is Breast Cancer Awareness Month. According to doctors, the most frequent cancer in women in India is breast cancer, which accounts for 25% to 32% of all malignancies in women in Indian cities (according to cancer registries based on the urban population) and is the second most common disease in rural regions.

- In addition to the prevalence (current instances) of approximately 30,000 cases, it is projected that over 9,800 new cases of breast cancer are diagnosed in Karnataka each year according to statistics from the state-run Kidwai Memorial Institute of Oncology, the nodal centre that manages the State registry. According to statistics, 1,688 more instances of breast cancer are believed to be detected annually in Bengaluru, in addition to the 4,558 already known cases.

Policy Insight

- **THEME:** Cancer Burden
- **UPDATE:** Paediatric cancer deaths in India double of developed nations: Govt report

Key Highlights

- Due to problems including delayed diagnosis and lack of access to treatment, a skilled staff shortage, treatment inertia, and preventable relapse, paediatric cancer may be killing almost twice as many children in India as it does in wealthy nations. According to a study conducted by the Indian Council of Medical Research's National Centre for Disease Informatics and Research in conjunction with the World Health Organization-India, the five-year survival rate for children with cancer in India is only approximately 40%.
- The latest ICMR-NCDIR National Cancer Registry Report 2021 showed that childhood cancers, in the 0-14-year age group, accounted for 4 percent of all cancers recorded between 2012-2019 in the country
- The most common primary sites of pediatric cancers include the blood, bone and brain.

Policy Insight

- **THEME:** Cancer drug costs and Treatment
- **UPDATE:** Include cancer treatment under Aarogyasri: Telangana Governor Tamilisai Soundararajan

Key Highlights

- In order to assist needy patients, particularly breast cancer patients, Governor Tamilisai Soundararajan made a Monday request to the Telangana government to include the pricey cancer treatments and diagnostic procedures connected to cancer screening under Aarogyasri. She expressed worry about the high cost of cancer treatment and other diagnostic procedures and said that the health insurance programme needed to be expanded to help individuals who were facing significant costs. Tamilisai was speaking at the Raj Bhavan in this city as part of the Ushalakshmi Breast Cancer Foundation's International Breast Cancer Awareness Month event.
- Currently, the Aarogyasri health plan covers cancer surgery and chemotherapy. Tamilisai promised to personally send the State government a letter asking the inclusion of cancer treatment and cancer detection testing in the health programme.

Policy Insight

- **THEME:** Awareness and sensitization
- **UPDATE:** Campaign launched to sensitise women about cancer

Key Highlights

- Rotary club of SMART Hyderabad District 3150 kick-started a campaign to spread awareness on cancer in women, especially breast, oral and cervical cancers.
- In collaboration with Mahavir Hospital and Research Centre, and the MNJ Cancer Institute, it conducted free cancer screening at the said hospital. Women underwent screening tests such as Pap Smear I, oral and mammography. Given the requirement to get the tests done once a year, the Rotary club district 3150 has donated a state-of-the-art mobile cancer screening van equipped with a digital mammography unit and comprehensive facility for conducting tests in-house.
- This service project was inaugurated by Telangana High Court judge, Justice Nanda, who stressed the need for early detection and timely treatment by using latest technology to prevent/ treat cancers in women.
- The campaign was initiated by president of Rotary Club of Smart Hyderabad Chitra Chandrashekar.

Policy Insight

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Policy Insight

- **THEME:** Cancer Prevention
- **UPDATE:** AIIMS organises workshop on Breast Imaging & Interventions

Key Highlights

- A one-day CME and workshop on Breast Imaging & Interventions was held on 9th October at the All India Institute of Medical Sciences in Bhopal by the department of radiodiagnosis and imaging. Breast Imaging Society, India (BISI) and Indian Radiological and Imaging Association (IRIA) worked together to plan this full-day academic event as a community outreach programme in honour of Breast Cancer Awareness Month, which is held globally in the month of October. Delegates, educators, and dignitaries travelled from all across the nation to make the programme a smashing success. The educational activity, which featured a well-balanced schedule of interactive and didactic sessions followed by a hands-on workshop on breast treatments, was organised with the aim of instructing resident and practising doctors in breast imaging and interventions.
- The faculty led a hands-on session where they presented practical demonstrations on how to carry out wire localization, ultrasound-guided stereotactic breast biopsy, and mammography-assisted stereotactic breast biopsy. The delegates took part with great enthusiasm and had the chance to carry out these operations on their own with faculty supervision. Prof. (Dr.) Ajai Singh, CEO & Executive Director, AIIMS Bhopal, served as the event's chief guest. Other dignitaries who attended the event included Prof. (Dr.) Manisha Shrivastava, Medical Superintendent, AIIMS Bhopal, Prof. (Dr.) Rajesh Malik, Dean (Acad.) & Head, Department of Radiodiagnosis and Imaging, AIIMS Bhopal, Dr. Pushpraj Bhatele, National President IRIA, Dr. Pankaj Yadav, President MP state chapter of IRIA, office bearers of IRIA.

Policy Insight

■ **THEME:** Screening

■ **UPDATE:** Cervical cancer screening rates extremely low in Karnataka

Key Highlights

■ Cervical cancer is the second most prevalent malignancy among women in Karnataka, accounting for roughly 12% of cases. It can be stopped or caught early with regular screening. However, the state's rate of this cancer screening is pitifully low. In a recent report, the Karnataka Health Vision Group noted that just 0.5% of women in the state between the ages of 15 and 49 had their cervixes examined. Additionally, just 0.2% of Bengaluru's female population has had a cervical cancer screening. A quarter of the respondents hadn't completed their secondary school, and more than half were unemployed. Approximately 80% did not have health insurance, and a similar percentage did not have the choice to decide how much they would spend on medical treatment.

■ According to the study, one of the main causes of the low screening rates was a lack of knowledge. 62% of those surveyed had never heard of cervical cancer, and 87% did not know someone who had the illness. Nearly 90% were not aware that sexual contact might transmit the Human Papillomavirus (HPV) that causes cervical cancer. Additionally, 95% of respondents were ignorant about the screening and the necessity of routine screening.

Policy Insight

■ **THEME:** Cancer Burden

■ **UPDATE:** Number of new cancer cases in India expected to reach 1.5 million by 2025: PGA Labs Report

Key Highlights

- In India, more than 50% of cancer cases are discovered at advanced stages; if discovered earlier, survival chances can be increased by 50% to 80%. Low inclination to voluntarily choose for cancer screening tests has been attributed to lack of knowledge about pertinent tests and high prices of risk assessment testing for malignancies.
- According to PGA Labs' assessment on the oncology domain, 1.5 million additional cases of cancer are anticipated in India by 2025. According to the survey, breast and cervical cancer have the greatest incidence rates among women, while oral and lung cancer are more common in males.

Pharma and Device

■ **THEME:** Cancer Technology

■ **UPDATE:** Niramai launches AI-enabled Online Health Risk Assessment for women

Key Highlights

- As part of October's Breast Cancer Awareness Month, Niramai has unveiled a new project. For socially conscious groups, the new programme provides "Easy Launch Kits" for breast cancer screening as an unique "Starter Kit" that enables them to deliver accurate breast cancer screening services for just Rs. 1000 per day. With the use of this kit, partner cancer societies, hospitals, diagnostic facilities, and NGOs may offer limitless monthly screenings of Niramai's automated breast cancer screening service to the general public and identify individuals who have a high likelihood of having breast cancer.
- For urban women, Niramai has also introduced a free Whatsapp chatbot at +91 94834 34444. This is a free "breast health support line" where women may ask any concerns about breast health and estimate their risk of developing breast cancer using a verified Machine-Learning-based risk assessment service using Niramai's ChatBot. This short online assessment exam just takes a few minutes, and the results are given right away.

Pharma and Device

- **THEME:** Palliative Care
- **UPDATE:** Only 1-2% of population who need palliative care have access to it: FICCI report

Key Highlights

- The survey reveals that most States lack enabling policies to incorporate palliative care into the therapy provided to patients, despite the fact that India ranks third in terms of cancer incidence. In India, just 1-2% of people who require palliative care get access to it, compared to the global average of 14%, according to data analysis from the Health Ministry given by the Federation of Indian Chambers of Commerce & Industry's health unit (FICCI).
- There are now just three States in India with a palliative care policy: Kerala, Karnataka, and Maharashtra. With more than 130 cases per 100,000 people, Kerala, Mizoram, Tamil Nadu, Karnataka, Punjab, and Assam have the highest crude incidence rates of cancer. India's disease burden for head and neck, breast, cervix, and ovarian cancers is greater than that of other nations like China, the U.S., and the UK in a global comparison for organ-wise incidence. According to a survey on the occurrence of cancer in the nation, the cost of treating cancer is the highest of all diseases, rendering it unaffordable for more than 80% of the population.

Pharma and Device

- **THEME:** Cancer Technology
- **UPDATE:** The Indian AI enabled Colposcope – A ray of hope for the fight against cervical cancer

Key Highlights

- The Colposcope, a gadget that has been developed with AI technology by the All India Institute of Medical Sciences (AIIMS) Delhi, has been successfully developed to assist in the diagnosis of cervical cancer patients in India. The Ceravac vaccine, which was created in-country and was recently included in the Indian government's Universal Immunization Program, would protect females from the age of 14 against cervical cancer before they engage in sexual activity. The Indian government's two actions have given the cervical cancer campaign some optimism. Once found, it may be effectively treated, allowing the patient to live a normal life.

International Developments



Policy Insight

■ **THEME:** Cancer Burden

■ **UPDATE:** Global burden of liver cancer could rise by more than 55% by 2040, analysis reveals

Key Highlights

■ Investigators collected information on primary liver cancer cases and fatalities from the GLOBOCAN 2020 database of the International Agency for Research on Cancer, which generates estimates of cancer incidence and mortality for 36 cancer types in 185 nations worldwide. United Nations population forecasts were used to determine the projected change in the number of cancer cases or deaths by the year 2040. According to the findings, 830,200 people worldwide would die from liver cancer in 2020, with an anticipated 905,700 more receiving liver cancer diagnoses. These statistics show that liver cancer is now one of the top three cancer mortality causes in 46 nations and one of the top five cancer death causes in almost 100 nations, including numerous high-income nations.

■ Eastern Asia, Northern Africa, and South-Eastern Asia had the greatest incidence and fatality rates for liver cancer. If present rates do not improve, researchers project that over the next 20 years, the number of new cases and fatalities from liver cancer would increase by more than 55% annually. The number of cases that are expected to grow will raise the demand for resources to manage patient care for liver cancer. The discovery that liver cancer incidence and fatalities will keep rising year after year concerned the researchers. They warn that governments all over the world must achieve at least a 3% yearly decline in liver cancer incidence and mortality rates through preventative efforts in order to avert this increase in cases and deaths.

Policy Insight

■ **THEME:** Cancer Burden

■ **UPDATE:** Most women unaware of symptoms of aggressive form of breast cancer, says study

Key Highlights

- According to a recent US survey, the majority of women are ignorant of the peculiar signs and symptoms of inflammatory breast cancer, a particularly lethal and aggressive type of the illness. A lump in the breast is recognised by four out of five women (78 percent) as an indication of breast cancer, according to a poll that involved 1,100 US women who were 18 years of age and older and was done online. Less than half of women would mention breast redness (44 percent), skin pitting or thickening (44 percent), or the sensation of one breast being heavier or warmer than the other (34 percent) as potential indications of breast cancer, particularly the uncommon and severely aggressive subtype known as inflammatory breast cancer.
- Any area of the breast and any molecular sub-form of the illness are susceptible to the disease. Because it resembles symptoms similar to a breast infection, it is frequently misdiagnosed. These symptoms include a texture or dimpling of the skin that resembles an orange peel, a sense of heaviness, a tightness of the skin, engorgement of the breast, and redness that resembles an infection.

Pipeline News

■ **THEME:** Cancer Burden

■ **UPDATE:** Individuals with inflammatory breast cancer face a higher risk brain metastases

Key Highlights

- According to recent studies, there is an increased risk of brain metastasis in those with the uncommon subtype of breast cancer known as inflammatory breast cancer. The research is made available online by Wiley in *CANCER*, a peer-reviewed publication of the American Cancer Society. The majority of the study participants with brain metastases had neurologic symptoms, but the true incidence of brain metastases in patients with inflammatory breast cancer is probably even higher than what Dr. Warren and her colleagues observed because some patients may have undetected, asymptomatic brain metastases.

Policy Insight

- **THEME:** Cancer Breakthrough
- **UPDATE:** Breakthrough in finding a new gene target for aggressive lung cancer

Key Highlights

- A novel gene that initiates an aggressive form of small-cell lung cancer has been discovered by Northwestern University researchers. There is no known cure or efficient treatment for the aggressive variant of this malignancy, known as P subtype. Unfortunately, many patients and their families discover that there are few effective treatments available for small-cell lung cancer. This lung cancer tumour needs a certain gene in order to survive and grow, according to researchers. To locate and identify the particular gene, the scientists employed genome-wide CRISPR screening. The particular gene was identified by Wang and his colleagues, and it was then possible to delete it in small-cell lung cancer cells both in vitro and in animals.

- The cancer cells lost their ability to live and perished when these genes were removed. This study demonstrates that it is part of the early stages of developing a medicine that may accomplish the same, eliminating the particular cancer cells. In order to treat individuals with this subtype of lung cancer, researchers intend to create a medication that interferes with the gene's activity. Based on the novel roles revealed in this recent study, the team has dubbed the gene POU2AF2. With the help of this research, it is hoped to identify this subtype of small-cell lung cancer early and, ultimately, develop new therapies for it. a promising development in the fight against lung cancer.

Pharma and Medical Device

- **THEME:** Cancer Breakthrough
- **UPDATE:** Technology allows patients with early-stage breast cancer to avoid lymph node removal

Key Highlights

- In order to support a novel method termed delayed sentinel lymph node biopsy, Allegheny Health Network implemented the magnetic sensing technology Magtrace. The technique, which the Food and Drug Administration approved in 2018, gives patients and doctors more time when performing a mastectomy. Now that they have a 30-day window to remove lymph nodes thought to be harbouring malignant cells, ductal carcinoma in situ (DCIS) patients can avoid needless discomfort, infection, and edoema.
- DCIS, in which malignant cells are discovered in the milk ducts of the breast but have not yet infiltrated the blood stream or lymphatic system, accounts for around 20% of the 1.7 million new instances of breast cancer that are identified worldwide each year. Many people can be effectively treated by removing the tumour itself, but depending on the severity of their disease, some must completely lose one or both breasts.
- A sentinel lymph node biopsy was not required in 78% of the 189 DCIS patients who had lumpectomy or mastectomy in a 2019 evaluation of the technology in Sweden. Additionally, for the 47 patients whose cancer was shown to be invasive, Magtrace effectively permitted delayed lymph node biopsy.

Policy Insight

- **THEME:** Risk Factor
- **UPDATE:** Keep worries at bay: Chronic stress can increase the risk of death by cancer, says study

Key Highlights

- According to a recent study, prolonged and chronic stress can increase the body's excessive "wear and tear," which raises the chance of dying from cancer. The word "wear and tear" refers to the accumulated consequences of stress over time, or "allostatic load" in scientific terminology. When someone is under stress, their body releases cortisol, a stress hormone that usually returns to normal when the external pressures have passed. Chronically stressed individuals, however, do not have it easy, according to a research published in the SSM Population Health journal.

Pipeline News

- **THEME:** Cancer Breakthrough
- **UPDATE:** New gene target discovered for aggressive small-cell lung cancer subtype

Key Highlights

- Researchers at Northwestern Medicine have discovered and described a gene that activates the P subtype of small-cell lung cancer (SCLC), the most aggressive form. Lu Wang, the study's primary author and an associate professor of biochemistry and molecular genetics at Northwestern University Feinberg School of Medicine, claims that 70% of instances of SCLC are discovered late in the disease's progression, when it is more difficult to cure. Chemotherapy is the principal treatment for the aggressive SCLC-P subtype. Most patients experience chemoresistance, which reduces the effectiveness of treatment and frequently results in recurrence.

- Wang's team discovered the uncharacterized gene C11orf53 by genome-wide CRISPR screening, which was expressed in both SCLC cell lines and patient samples. A 288-amino acid protein that C11orf53 encodes for lacks any functional domains or cellular localization signals. The study found that POU2F3, a crucial regulator that has been utilised as a biomarker for the P subtype, coactivates C11orf53.

Pipeline News

- **THEME:** Cancer Breakthrough
- **UPDATE:** Largest academic collaboration aims to transform the treatment for pediatric cancers

Key Highlights

- The Dana-Farber Cancer Institute, St. Jude Children's Research Hospital, and The Broad Institute of MIT and Harvard today announced the largest academic partnership of its kind to transform and speed up the identification of vulnerabilities in paediatric cancers and translate those vulnerabilities into better treatments. The three institutions have committed a fresh combined financing investment of more than \$60 million over five years to the relationship. With more than 80 cooperating investigators, data scientists, and research personnel, this funding will support infrastructure development and scientific activities. As each school hires more personnel, the endeavour is anticipated to grow to 100 individuals.

- The partnership draws on innovative research projects from each university. The St. Jude-Washington University Pediatric Cancer Genome Project and other extensive sequencing initiatives have provided valuable insights into the genomic landscape of paediatric cancers over the past ten years, including the realisation that the majority of the genetic mutations that cause disease are not treatable. Finding cancer dependencies and vulnerabilities that are not disclosed by mining genomic information alone will be necessary for developing precision medicines.