**National Cancer Advisory Board (NCAB)**
***ad hoc* Subcommittee on Global Cancer Research**

**August 31, 2021**
**1:00–2:00 p.m. EDT**
**Virtual Meeting**

**SUMMARY**

Subcommittee Members
Dr. Francis Ali-Osman, Chair
Dr. Peter Adamson
Dr. Deborah Bruner
Dr. Yuan Chang (absent)
Dr. Lawrence O. Gostin
Dr. Satish Gopal, Executive Secretary
Dr. Scott W. Heibert
Dr. Electra Paskett
Dr. Nancy Raab-Traub
Dr. Margaret Spitz
Dr. Max Wicha (absent)

Other Participants
Dr. Gwen W. Collman, NIEHS Ex Officio Alternate
Dr. Howard J. Fingert, NCAB
Dr. Patti E. Gravitt, NCI
Dr. Paulette S. Gray, NCI
Dr. Nikan Khatibi, NCAB
Dr. Douglas R. Lowy, NCI
Ms. Anne Lubenow, NCI
Ms. Thu Nguyen, NCI
Mr. Ricardo Rawle, NCI
Dr. Norman E. Sharpless, NCI
Dr. Susan Thomas Vadaparampil, NCAB
Ms. Joy Wiszneauchas, NCI
Dr. Amanda Webb, The Scientific Consulting Group, Inc., Rapporteur

**Welcome and Opening Remarks**
*Dr. Francis Ali-Osman, Margaret Harris and David Silverman Professor of Neuro-Oncology, Professor Emeritus of Neurosurgery, Duke University Medical School*

Dr. Francis Ali-Osman, Subcommittee Chair, stated that this NCAB *ad hoc* Subcommittee on Global Cancer Research (Subcommittee) is charged with advising the NCAB and the NCI Director on strategic approaches and opportunities to enhance the NCI's contribution to global cancer research. This Subcommittee also will provide leadership and expertise with the intent of offering input on various initiatives, concepts, and partnerships, as well as provide information to help determine the prioritization of new prospects for the NCI in global cancer research. The Subcommittee also may cite new opportunities whereby the NCI can contribute internationally, such as by advancing clinical cancer research, building and bridging technology and research capacity, or promoting training programs.

**NCI Director's Opening Remarks**
*Dr. Norman E. Sharpless, Director, NCI*

Dr. Norman E. Sharpless, Director, NCI, welcomed everyone to the virtual meeting of the Global Cancer Research Subcommittee and reflected on the NCI's commitment to support global health. Because the meeting coincides with the 10th anniversary of the Center for Global Health (CGH), the meeting will touch on which of the CGH's work is successful and which work requires further optimization.

**Update on NCI Center for Global Health**
*Dr. Satish Gopal, Director, CGH, NCI*

Dr. Satish Gopal, Subcommittee Executive Secretary, Director, CGH, updated the Subcommittee on the key accomplishments of the CGH from the past year. Many of these new initiatives had already been presented at recent board meetings, and he therefore focused on five specific accomplishments in his presentation: (1) CGH 10-year anniversary commemoration launch, (2) 9th Annual Symposium on Global Cancer Research, (3) CGH 2021–2025 Strategic Plan launch, (4) Dr. Patti E. Gravitt's joining the CGH as Deputy Director, and (5) first cohort of NCI D43 low- and middle-income countries (LMIC) institutional training awards.

The 10-year anniversary of the establishment of the CGH coincided with the 50th anniversary of the National Cancer Act, providing a unique opportunity to celebrate global health at the NCI. The CGH initiated a new seminar series, held podcast-style conversations with global health leaders, and highlighted global health efforts across the NCI on social media.

The 9th Annual Symposium on Global Cancer Research included 29 speakers from 12 countries; 428 attendees from institutions in 45 countries; 101 accepted abstracts covering research in 68 countries; and 59,473 website visits from 35,688 individual users in 100 countries. In response to the COVID-19 pandemic, the meeting was virtual, which resulted in a broader reach that led to increased engagement from the global research community, particularly first-time attendees from LMICs.

The CGH 2021–2025 Strategic Plan was launched in May 2021. During the past 10 years, substantial progress was made in the area of global cancer research, leading to a shift in focus in the new Strategic Plan from establishing CGH to more fully evolving its role in global cancer activities, as well as moving from integrating cancer in global health to prioritizing cancer in global health. The CGH is working to end cancer as we know it equitably, not simply for a subset of people in high-income countries. The Strategic Plan has four key goals:

- **Research**—Support innovative, impactful research that (a) addresses key scientific issues in global cancer control and/or (b) leverages unique or unusual scientific opportunities afforded by collaboration with global partners.
- **Research Training**—Support cancer research training that enables equitable, impactful global scientific collaboration.
- **Dissemination**—Promote the integration of current scientific knowledge into global cancer control policies and practice.
- **Partnerships**—Represent the NCI and promote its engagement with key partners in global cancer research and control.

The Strategic Plan research themes and programs are to accelerate technology development for global cancer control, accelerate global cancer implementation science, understand and address global cancer health disparities, increase support for cancer clinical trials in LMICs, and increase understanding of cancer etiology and biology through global collaboration.

People from LMICs are projected to represent 69 percent of global cancer deaths by 2040. The largest proportional increases will occur in the lowest income countries, which are projected to have a near doubling of cancer deaths from 2020 to 2040. The scale of daily global suffering from cancer is immense, and the CGH will work to alleviate this suffering by focusing on LMICs, which are most in need of attention. The NCI extramural global portfolio reveals that a majority of awards are going to U.S. institutions, with approximately 13 percent of awards being distributed to U.S. institutions with foreign components and less than 1 percent of awards being direct international awards. The proportion of

direct international awards has remained low and constant over time. County-level participation in the NCI extramural global portfolio in 2020 represents most world regions, with decreasing participation observed with decreasing country income level. CGH's focus on LMICs is, thus, appropriate to both help address global cancer burden and realize scientific opportunities that are not well represented in the NCI research portfolio.

The CGH maintains a strong focus on global cancer research training. Reflecting this goal, the CGH recently awarded new D43 grants to increase institutional support for global cancer research training. The D43 program was developed in response to data from the last global oncology survey from NCI-Designated Cancer Centers in 2018, which demonstrated marked expansion of global oncology activities and Cancer Centers without commensurate global cancer research training. CGH considered that an inadequately trained workforce in this area posed a substantial risk to global cancer research as an emerging scientific discipline, and CGH has sought to address this via programs supporting training.

Dr. Gopal highlighted the CGH Strategic Plan research training programs, which include Strengthening Institutional Capacity to Conduct Global Cancer Research (RFA-CA-20-031); International Research Scientist Development Award (PAR-21-104/105); Emerging Global Leader Award (PAR-19-051/098); Cancer Research Training Travel Awards for LMIC Investigators (extramural); and Short-Term Scientist Exchange Program (intramural).

In the future, CGH will be supporting NCI participation in the upcoming World Cancer Leaders' Summit in October 2021, the African Organization for Research and Training in Cancer virtual meeting in November 2021, and London Global Cancer Week in November 2021. Dr. Gravitt will be a key partner in the CGH's current and future efforts. She joined the CGH in July 2021 and is highly qualified for her new position as Deputy Director of the CGH.

*Discussion*

Dr. Electra Paskett noted that the length (110 pages) of the CGH survey that was sent to Cancer Centers can be overwhelming and might reduce the overall response rate. Dr. Gopal responded that the survey was tested with Cancer Centers before it was distributed broadly. He stated that his team will consider ways to improve the survey.

Dr. Margaret Spitz asked if Dr. Gopal would like the Subcommittee members to focus on any particular issues or areas of concern when advising the NCAB. Dr. Gopal responded that the NCI implementation science portfolio in LMICs is relatively small, so the CGH would like to focus on that particular area and would benefit from Subcommittee input. Dr. Ali-Osman recommended that this topic be revisited during the discussion after Dr. Gravitt's presentation.

Dr. Nancy Raab-Traub noted that a disproportionate number of global grants were awarded to China. She asked about the types of studies that are unique to China and justify that large number of awards. Dr. Gopal agreed that China is well represented in the NCI portfolio, stating that this is partially due to the high burden of cancer in China and partially due to the number of investigators and collaborators in China. Dr. Ali-Osman noted that a high burden of cancer exists in other countries as well, suggesting that the CGH review its current distribution of resources.

Dr. Deborah Bruner asked how the current geopolitical climate is affecting the work that the NCI is doing with China, noting the highly politically charged atmosphere surrounding research in China concerning gain-of-function research related to COVID-19. Dr. Gopal admitted that the United States' relationship with China is complicated, but stated that the CGH has been working closely with other representatives of the U.S. government to ensure that it is responsive to geopolitical concerns. Dr. Sharpless added that the NCI has had to strike a balance between admitting to information and data sharing difficulties associated

with research in China and continuing the NCI's investment in scientific collaborations with China that have been productive to both China and the United States.

Dr. Ali-Osman asked how the goals of the Strategic Plan will be monitored. Dr. Gopal answered that the CGH has moved to an implementation phase for components of the Strategic Plan. The NIH has a new Strategic Planning tracking tool, which the CGH is using and modifying for its purposes. The CGH also is considering other tracking metrics for its goals.

**Implementation Science to Reduce Inequities in Global Cancer Control**
*Dr. Patti E. Gravitt, Deputy Director, CGH, NCI*

Dr. Gravitt explained that implementation science is necessary to close the 17-year evidence-to-practice translational research gap (translational gap). The Cancer Moonshot$^{SM}$ Blue Ribbon Panel included in its 10 transformative research recommendations the use of implementation science to expand the use of proven cancer prevention and early detection strategies. In addition, the International Agency for Research on Cancer 2021–2025 Strategic Plan includes implementation research as one of three emerging research priorities.

Implementation science differs from general biomedical research in that it is centered on whether and how interventions work, rather than on health outcomes. Using traditional biomedical research, knowledge is generated through basic, clinical, and population research, leading to hypotheses and the development of interventions. These interventions can then be evaluated using implementation science, through which investigators ask what works for whom, in what circumstances, and why.

The translational gap can occur because of the under, over, or misappropriated use of developed interventions. Such misuse can result in a continuously high burden of cancer despite the existence of effective therapies. Implementation science works to bridge the translational gap, optimizing the use of developed interventions by facilitating a greater understanding of the implementation process, leading to strategies to overcome individual and organizational barriers, and testing and adapting strategies in new contexts. These strategies lead to a decreased burden of disease due to the interventions being applied via effective context adaptation established during the implementation process.

Ultimately, implementation science is the study of methods to promote the adoption and integration of evidence-based practices, interventions, and policies in routine health care and public health settings. Implementation science's focus on context and complexity as research targets contrasts with traditional biomedical research, which views context and complexity as confounders to be controlled. The real-world effectiveness of evidence-based interventions requires an understanding of the interactions involved in implementing complex interventions into complex health systems in a variety of sociopolitical, socioeconomic, and cultural contexts.

Dr. Gravitt provided an example of implementation science and the need for it by presenting the context and complexity surrounding COVID-19 interventions, such as vaccines and masking. Both interventions had demonstrated efficacy in reducing pandemic spread via biomedical research, but the implementation of these interventions was affected significantly by the actions of implementation agents (e.g., public health agencies, employers, schools, health systems, pharmacies, government, community groups, individuals) that either hindered or improved adoption of the interventions. Implementation science helped to identify strategies (e.g., vaccine and mask mandates, restrictions, incentives, peer advocacy) to improve uptake of these interventions.

The CGH has developed a strategic plan for 2021–2025 that includes priority areas for implementation science. Global implementation science is best considered in the context of systems. Many implementation strategies are designed to react to observed events. CGH seeks to support research that

looks deeper to understand the patterns, underlying structures, and mental models that result in similar events across a variety of contexts.

Viewing implementation science globally requires a perspective shift from traditional linear to complex systems, moving from purely reductionist methods to systems science methods. Cancer control interventions are implemented in complex systems. Complex systems are characterized by large numbers of heterogenous elements that interact with each other, producing an emergent effect that is different from the effects of the individual component elements. This emergent effect persists over time and adapts to changing circumstances.

Complex systems studies can remain rigorous and generalizable. Study designs include hypothesis generation, hypothesis testing, and evidence synthesis studies. Systems approaches have been adopted increasingly both overall and in cancer research, as is evidenced by the increase in systems thinking, complex adaptive systems, or systems science research publications. The application of systems thinking in implementation research, however, is not equitably distributed across the globe, with most of these studies occurring in the northern hemisphere. The CGH is working to reduce such inequities through its training support, partnerships with international consortia, and research funding opportunities.

Dr. Gravitt noted that the global disparities in systems research does not indicate a lack of implementation outcomes in LMICs, indicating that from 1998 to 2016, 10,292 research or evaluation articles described the implementation of health initiatives in LMICs. A lack of standardization and reporting, however, has led to the loss of critical knowledge generated through LMICs' work in this area.

By integrating the CGH's traditional biomedical research pathway with an emergent implementation science pathway, CGH can build an evidence base that will enable the development of context-adapted guidelines leading to equitable cancer control. The granular implementation processes and strategies will best fit a specific setting, but if the CGH uses concepts of realist evaluation and synthesis aided by standardized measures and reporting, the generation and testing of broader theories of action and generalizable rules of implementation are possible.

*Discussion*

Dr. Susan Vadaparmpil asked whether the CGH has considered repurposing existing NCI training programs and modules that have been used in the United States to train investigators in LMICs. Dr. Gravitt responded that the CGH has been working with the Division of Cancer Control and Population Sciences to employ this strategy, adding that it is focused on developing a training protocol that facilitates bidirectional knowledge transfer between the CGH and trainees.

Dr. Ali-Osman commented that Dr. Gravitt adequately presented the complexity of implementation science, providing the example of implementing mammography studies in African countries that required the application of different strategies in different contexts. He asked how the CGH will work in similar circumstances moving forward. Dr. Gravitt answered that the delivery of technologies and methods that work well in places with differing resources and contexts is challenging. She has found that the engagement of a broad range of stakeholders is effective in overcoming this challenge because stakeholder input can help the CGH to better understand specific structural and behavioral challenges that must be considered for effective implementation. Once those challenges are met, the challenges and solutions must be reported in the scientific literature such that the strategies for overcoming those challenges can be applied to new settings.

Dr. Lawrence O. Gostin asked about providing resources to civil society actors who can be critical for public acceptance and successful implementation of interventions. Dr. Gravitt suggested that requiring via requests for applications (RFAs) the inclusion of stakeholder engagement in early research design stages

could be instrumental in making intervention implementations successful. Dr. Gostin noted that the Global Fund has a good model for that kind of work that ensures that researchers, government entities, and civil society actors are involved in the same projects. Dr. Gravitt noted that she wants to learn from and adopt such successful models.

**Other Business**

*Dr. Francis Ali-Osman, Margaret Harris and David Silverman Professor of Neuro-Oncology, Professor Emeritus of Neurosurgery, Duke University Medical School*

Dr. Ali-Osman suggested that the next Subcommittee meeting address new additions, recruitment, and restructuring that will facilitate activities of the CGH Strategic Plan. Dr. Gopal enthusiastically agreed.

Dr. Sharpless thanked everyone for a productive meeting and mentioned that members can send additional comments or questions to him or Dr. Gopal.

**Adjournment**

Dr. Ali-Osman expressed appreciation to the CGH for the updates and adjourned the Subcommittee meeting at 1:58 p.m. EDT.

| | | | |
|---|---|---|---|
| Dr. Francis Ali-Osman<br>Chair | Date | Dr. Satish Gopal<br>Executive Secretary | Date |