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From mission hospital to medical research hub: the journey of AIC Kijabe Hospital

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AIC Kijabe Hospital (AICKH) in Kenya started in 1915 as a small clinic serving the surrounding rural community. In recent decades, it has transformed into a large teaching hospital with growing expertise in healthcare research and training with grant support for large multi-institutional trials, integrated research instruction for students and residents, and more than 40 research projects launched and completed annually. Its progress is unusual due to its rural location and lack of a primary university affiliation, but is instructive to other hospitals and health systems seeking to follow a similar path. The authors reviewed hospital documents supplemented by personal experiences to identify key developmental milestones in the history of research at AICKH including creation of an internationally-recognized ethics review board, pursuit of academic partnerships, establishment of data repositories, dissemination of research training, and formation of a research department. Authors then used these historical milestones to identify themes that have been critical to the success of the research endeavors at AICKH including partnerships that promote bilateral exchange, institutional commitment, educational growth as an accelerator of research, and widespread training in research fundamentals. Challenges common to growing research (generating funding, prioritizing research in a clinical environment, building expertise among staff, identifying appropriate partners) are described with a focus on concerns unique to settings without historical academic ties. The article concludes with a call for other institutions in similar settings to embark on a research journey for the sake of improving knowledge and patient care in areas of need.

KEYWORDS
development, education, low- and middle-income countries (LMIC), partnerships, research

1 Introduction

Healthcare research in low- and middle-income countries is vital to the generation of contextual knowledge, professional growth, health systems improvement, and progress in advancing patient outcomes (Dye et al., 2013). Unfortunately, despite increased attention to the disparities in research production in the past two decades a large gap remains in scholarship from under-resourced settings (Franzen et al., 2017). Research capacity strengthening is often

described at the individual level but can also occur at institutional and societal levels (Pulford et al., 2024; McGuire et al., 2025). This perspective article describes the arduous and persistent development of research capacity over the course of 30 years at a rural faith-based hospital in Kenya. By highlighting challenges and successes, we aim to provide insight that may be applied to other similar settings.

1.1 History of AIC Kijabe Hospital

AIC Kijabe Hospital (AICKH) started as a small clinic at a missionary outpost in 1915 in a rural Kenyan town located 60 kilometers from Nairobi. The hospital remained focused on serving its local community for several decades while medical services gradually expanded and the first building of the current hospital complex was opened in 1961. As Kenya advanced into independence and beyond, the hospital evolved from its missionary-run origin into a larger faith-based referral institution under the sponsorship of the Africa Inland Church (Kenya) (AIC). A major inpatient expansion developed in the 1970s, allowing the hospital to attract patients from a larger regional catchment area. An influx of investment in the 2000s led to facility expansions including additional operating theatres (2010, 2018) and an inpatient pediatric ward (2015). Infrastructure now includes a 363-bed facility, with multiple wards (surgery, obstetrics & gynecology, medical, neonatal care, rehabilitation, intensive care), 15 operating rooms, a 24-h casualty department, and a full-service pathology/laboratory/radiology department, eye clinic and dental facility. More recent expansions include development of a cancer care center (with oncology, screening and palliative care services) responding to Kenya's growing cancer burden. Also, as part of integrating non-communicable disease (NCD) and HIV services, infrastructure such as waiting bays, consultation rooms and electronic health record systems were expanded. The hospital has maintained its original commitment to clinical care and now sees 120,000 outpatients, performs 9,000 surgeries, and admits 25,000 patients annually.

The development of human resources at AICKH mirrors the growth of facilities and infrastructure. In 1980, a school of nursing was opened to train nurses for a variety of inpatient and outpatient needs. The hospital at this time was primarily managed by non-Kenyan generalist surgeons and physicians with expatriate and Kenyan nurses running the school. In the 1990s, specialty areas developed, including orthopedics, pathology, and anesthesiology, and a physician internship program was started. These developments occurred in tandem with AICKH receiving more complex patients from a wider catchment area. The emergence of in-service capacity strengthening at this time also began to supply a source of advanced local clinician leaders that met perceived needs for patient care and training. One mark of the impact of in-service training is that former physician interns are now program directors in four AICKH residencies. Education expansion developed rapidly after 2010 including the development of advanced nursing and clinical officer programs (nurse anesthesia, emergency and critical care clinical officers, and pediatric emergency and critical care clinical officers) and physician specialty training programs (general surgery, orthopedic surgery, pediatric surgery, anesthesiology, obstetrics and gynecology, plastic surgery, family medicine, and pediatrics). Graduates of these programs have filled leadership positions in the hospital as consultant staff has transitioned from majority non-African to African physicians – AICKH currently has 55 African Consultants and 15 expatriate consultants and only one expatriate in senior leadership. The clinical and training progress represents a sustained investment in the hospital's mission "to glorify God through the provision of compassionate health care, excellent medical training, and spiritual ministry in Jesus Christ."

2 Historical timeline of research development

In the early 2000s, hospital leadership recognized the growing opportunity for research to enhance care not only at AICKH but also at hospitals in similar settings. Without a university affiliation, the hospital started to build its own research infrastructure. The hospital's first data archive was a simple, locally accessed computerized spreadsheet created in 1992 by the Department of Pathology to track pathologic descriptions and disease diagnoses over time. The hospital created a Division of Education and Research in 2003, followed by creation of the hospital's first institutional review board in 2007 and its accreditation with the Kenya National Commission for Science, Technology and Innovation (NACOSTI) in 2018. Major funding dedicated to research was first obtained in 2013 through the Improving Perioperative Anesthesia Care and Training (ImPACT) Africa grant through the General Electric Foundation in partnership with Vanderbilt University Medical Center (VUMC). A portion of the $3.1 million award for expanding nurse anesthesia training was devoted to creating a perioperative database collecting patient demographics, surgery and anesthetic details, and patient outcomes for over 75,000 patients in 4 countries (Sileshi et al., 2017). Part of this grant established a local Research Electronic Data Capture (REDCap) platform hosted locally (Harris et al., 2009; Harris et al., 2019), solidifying a robust and secure database that has since been adopted by several departments including pathology.

Historically, inpatient and outpatient clinical data at AICKH not specific to a department or service (such as the Pathology archive) were recorded on paper charts and stored locally. In 2019, the hospital launched its own electronic medical record system. This health management information system (HMIS) integrated care across inpatient and outpatient domains, finance, and procurement. The data within the HMIS was more comprehensive than either the pathology archive, which collected only specimen and patient diagnosis data, and the perioperative database, which was specific to patients undergoing anesthesia. Previous electronic archives also required user input independent of patient care activities, an extra step which introduces the possibility of data loss. Although the primary aim of the HMIS was focused on patient care and operations, the electronic medical record has provided a more accessible and searchable medical record and facilitated auditing of charts (Obogwe and Kahoro, 2019).

In 2021, the departments within the Division of Education and Research were reorganized including a dedicated Department of Research. Staff members include a department lead, a biostatistician and data manager, a manager to coordinate the secretariat functions of the Internal Scientific and Ethics Review Board, and four research interns. Funding for the department is provided by the hospital to cover salary and operational expenses. Responsibilities of the department include grants administration, oversight of the institutional review board, facilitating staff and trainee research through workshops and consultation, and promoting research activities within the hospital. The first AICKH Research Day was held in 2018, prior to the establishment of the department to showcase trainee research. After

the founding of the research department, this became an annual event. The annual research day provides a series of talks on research development topics and a poster presentation for published research, quality improvement, education programs, and works in progress featuring between 50 and 60 individual posters and projects with representation from all divisions of the hospital from clinical to education to support services and finance. These key milestones have been vital catalysts for research development at AICKH (Figure 1).

3 People, partnerships, and buy-in

The development of research capacity at AICKH has been grounded in a network of committed individuals and strategic global partnerships. Early clinician-researchers were instrumental in establishing a foundation of clinical inquiry, particularly in surgical outcomes, reconstructive surgery, and trauma care. One notable faculty member's steady contributions have generated over 100 peer-reviewed publications (Figure 2), and this work, combined with the work of many other individuals, demonstrated that high-quality research could emerge from a rural faith-based hospital, fostering a culture of data-driven improvement that helped shape the academic identity of AICKH.

Strategic partnerships further expanded the hospital's research reach as evidenced by publication trends and institutional research-related initiatives over time. The collaboration with VUMC advanced anesthesiology research, linking clinical service with global health scholarship (Sileshi et al., 2017). Guided by a directive from the department of education, AICKH physicians partnered with volunteers to develop a seven-week research foundations course in 2016 (Tarpley et al., 2017). This was subsequently updated by AICKH surgeons who created a structured research training and mentorship program for postgraduate trainees in 2021 in partnership with Vanderbilt Institute for Global Health (VIGH). This 10-week course focuses on research question development, study design, basic biostatistics, and medical writing. In 2022, a National Cancer Institute Global Oncology Mentored Research with VUMC supported research mentorship was awarded to AICKH faculty to study advanced breast cancer outcomes, demonstrating the potential of cross-institutional collaboration to address pressing surgical oncology challenges in East Africa.

In addition, the hospital has made significant efforts to create a research-friendly environment by offering short courses in Qualitative Research Methods, and Analysis, Writing Workshops with paired mentorship, Biostatistics, and Clinical Research for its staff and students. These courses not only teach practical skills for designing, analyzing, and interpreting clinical studies but also foster a stronger sense of teamwork within the hospital community. Recruiting volunteers to dedicate teaching time has helped to reduce expenses relayed to preparation. In some cases, participants are charged fees to attend these courses to offset preparation and venue costs. These fees are kept to a minimum through support from college tuition and grants from the Division of Education and Research, which serves as a demonstration of the hospital's commitment to direct resources to implement these programs. As a result, both trainees and faculty have become actively involved in research through targeted mentorship and upskilling.

These local initiatives converged with multi-institutional efforts such as the BREATHE study, a multi-site acute hypoxemia outcomes project connecting Kenyan AICKH researchers with colleagues at Beth Israel Deaconess Medical Center in Boston, MA. Collaborating on a clinical trial across multiple institutions with a USD $3.3 million research budget helped AICKH refine its grants administration and management processes and grow institutional research capacity.

Local research partnerships have also increased capacity and opportunity for research development. Strategic engagement with

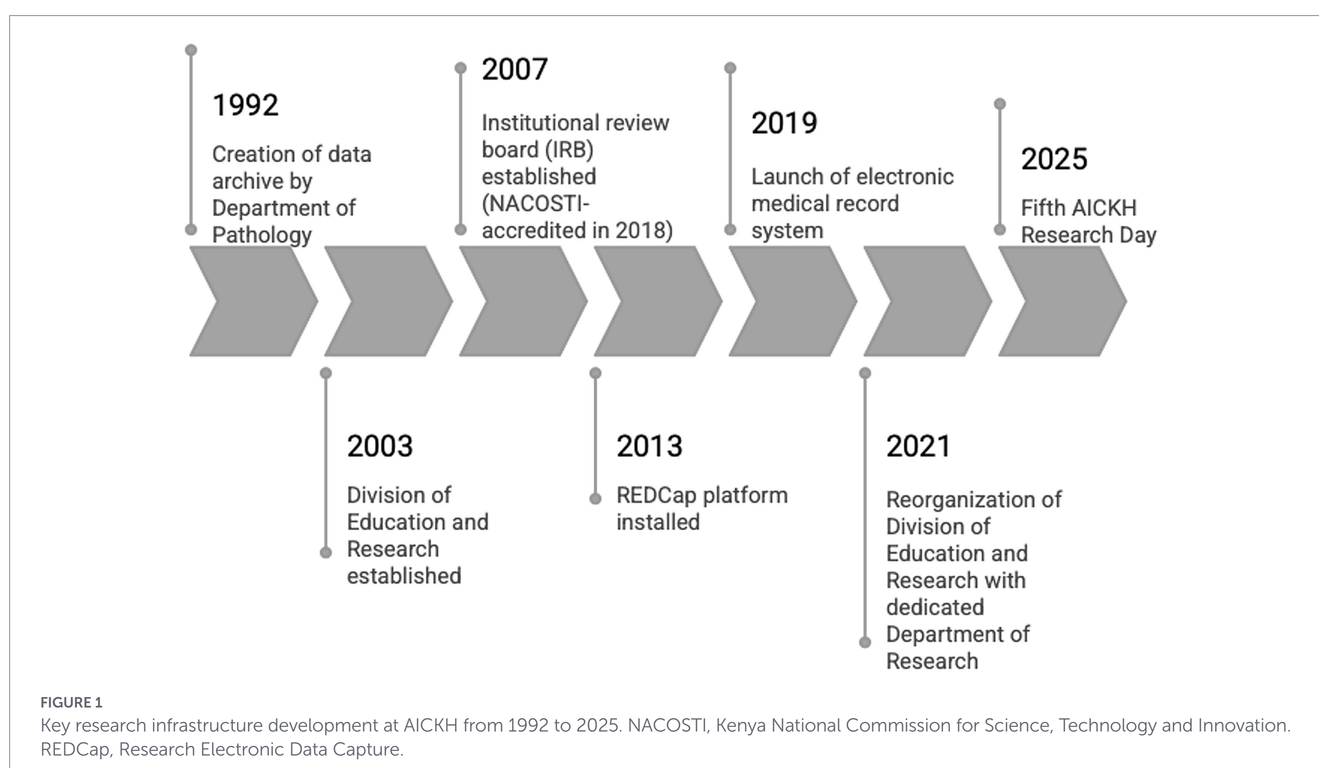

FIGURE 1
Key research infrastructure development at AICKH from 1992 to 2025. NACOSTI, Kenya National Commission for Science, Technology and Innovation. REDCap, Research Electronic Data Capture.

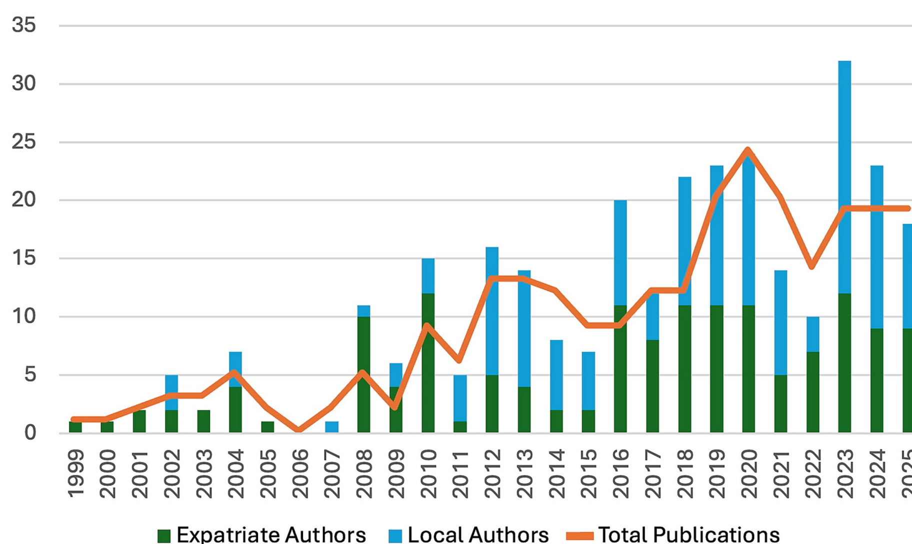

FIGURE 2
The annual count of publications including authors based at AICKH, with the number of expatriate and local authors for each year (authors with multiple publications in a year were counted once). Data collected through a PubMed search query: ("AIC Kijabe Hospital" [Affiliation] OR "Kijabe Hospital" [Affiliation] OR ("Kijabe" [Title/Abstract] AND Kenya)).

academic institutions such as the Pan-African Academy of Christian Surgeons (PAACS) and BethanyKids for surgical programs and Kabarak University for family medicine has created pathways for mentorship and training, linking clinical practice with scholarly productivity. Professional societies, including the Surgical Society of Kenya, Kenya Society of Anaesthesiologists, Kenya Paediatric Association, and the Critical Care Society of Kenya, have served not only as partners but also as advocates and promoters of research. Involvement in, and in some cases leadership of, these societies have facilitated research dissemination, networking, and alignment with national health priorities. Moreover, personal relationships among clinicians, educators, and researchers across these organizations have fostered trust, resource sharing, and co-authorship. While these relationships have historically been formed and maintained at an individual level, AICKH has also pursued institutional relationships that expand research opportunities. A memorandum of understanding with Scott Christian University in 2022 for education and another with the Nyeri County Government for plastic surgery training and service in 2025 are recent examples. Collaboration between AICKH and Kenyatta National Hospital produced the Africa Consortium for Quality Improvement Research in Frontline Healthcare (ACQUIRE) in 2020. In addition to hosting extensive in person and online training, this consortium has published manuscripts on healthcare quality (Adam et al., 2025; Jepkosgei et al., 2022).

4 Challenges and barriers

Developing a sustainable research hub within a rural faith-based hospital setting such as AICKH has faced several significant challenges. Infrastructure challenges can shape both the pace and quality of research activity. In the past, limited access to reliable internet connectivity, data storage, and analytic software restricted the ability to manage large datasets or engage in real-time collaboration with international partners and data collection. Laboratory capacity, diagnostic technology, and clinical records were originally designed primarily for clinical service rather than research, leading to constraints in specimen processing, biobanking, advanced testing, and clinical research. Although AICKH has made progress in creating clinical systems with a dual research purpose, the absence of integrated electronic health record systems outside of the hospital and robust data governance frameworks continue to hinder efficient data extraction, monitoring, and quality assurance—essential components for modern clinical research. Kenya passed a landmark Data Protection Act in 2019 which governs how patient privacy and responsible data sharing are ensured in the country, which has provided increased scrutiny and some clarity to the data management landscape. We, and other comparable hospitals, however still have gaps that are not clearly addressed by the existing laws including data sharing and hosting between countries in an era of cloud computing.

Funding constraints represent another persistent obstacle. Faith-based hospitals depend heavily on clinical revenue and donor support to sustain patient care, leaving limited internal budgets for research infrastructure, staff time, or dedicated investigators. Consequently, most studies rely on bootstrapping efforts by squeezing research in between clinical duties. Where present, external grants from academic partners or philanthropic sources may prioritize donor-driven agendas rather than locally defined priorities. The episodic nature of such funding cycles makes it difficult to maintain continuity in personnel, data systems, or long-term research programs. Furthermore, navigating complex administrative processes for international funding can delay project initiation and limit institutional autonomy in research direction. AICKH's challenges around grants management led to the hiring of a full-time grant administrator and creation of a detailed funding pathway in 2024 to guide communication and provide transparency for funders and researchers.

Finally, faith-based hospitals must contend with ethical, cultural, and mission-related barriers that are unique to their dual identity as both nonprofit and community-centered institutions. Ethical and regulatory requirements often involve multiple layers of review including local hospital IRBs, national ethics bodies, and international

collaborating institutions, which can prolong study approvals and create confusion over oversight authority. In some contexts, cultural perceptions of research as experimental or intrusive may affect patient willingness to participate, emphasizing the need for culturally sensitive communication and informed consent processes. Clinicians, already balancing high patient volumes and on-call responsibilities, often struggle to allocate time for proposal writing, data collection, and publication. Without protected time or dedicated research staff, the clinical workload can overshadow academic engagement. While these barriers are nearly universal in healthcare, faith-based hospitals in low-resource settings do not traditionally have an academic mission which hinders the institutional will to overcome these barriers. The shift in focus for AICKH toward academics and education was pivotal to investing in solutions to overcome these challenges. As a demonstration of this shift, the interest in research at AICKH has advanced in parallel with the growth of residency programs in the institution, growing from four in 2015 to nine in 2025. This influx of graduate physicians has provided new opportunities for research engagement with potential for high quality when paired with research methods instruction and mentorship.

5 Results and impact

The growth and impact of research at AICKH can be measured in several ways. Publications by Kijabe-affiliated authors indexed in PubMed from 1999 to 2025 show an increase from 1 to 20 per year, with an increasing number of authors from local areas compared to expatriates (Figure 2). This represents a breadth of scholarship and authorship as seen in the increasing number of unique authors and publishing journals. Relative citation ratio (RCR) is a measure of publication influence that looks at a publication's number of citations within its field as defined by a co-citation network and normalized to a reference standard of NIH-funded publications (Hutchins et al., 2016). Publications with the highest RCR during this period have come in a variety of specialty areas, including infection control (Allegranzi et al., 2018) (RCR 6.16), burns (Nthumba, 2016) (RCR 5.46), healthcare financing (Yap et al., 2023) (RCR 4.48), pediatric emergency and critical care (Muttalib et al., 2021) (RCR 4.44), academic collaboration (Riviello et al., 2010) (RCR 4.44), and oncology (Mutebi et al., 2020) (RCR 4.4), a further demonstration of the multiple areas where research from AICKH has had impact.

The approach at AICKH has been to not only emphasize large-scale or heavily funded research conducted by dedicated academicians but also to inspire staff from all areas to seek out answers to their questions and observations. This has been exemplified by the now Annual AICKH Research Day, which started in 2021 as a way to promote scholarship among all members of the hospital community. Abstract submission from AICKH clinical and non-clinical staff and trainees has increased annually, with 52 poster presentations in 2024 followed by 58 poster presentations in 2025.

6 Learning points and future directions

The experience of developing a research culture at AICKH offers valuable lessons for building sustainable research programs in similar contexts. One key learning point has been the need to integrate research within existing clinical and training systems rather than treating it as a parallel activity. Embedding data collection into clinical workflows and engaging frontline staff in study design have ensured continuity even amid high service demands. Early champions, such as surgical, pediatric, and anesthesiology faculty, demonstrated that impactful research can emerge from resource-constrained environments when supported by mentorship and collaboration. The gradual establishment of an Institutional Review Board, data management systems, and research mentorship programs has laid the foundation for long-term sustainability and accountability.

Another critical lesson learned has been the importance of local ownership and contextual relevance. Research questions emerging from AICKH's patient population—such as pediatric surgical outcomes, anesthesia safety, and cancer care access—have been most impactful because they address immediate clinical and system challenges. Partnerships with universities and non-governmental organizations have succeeded because they emphasized capacity building, equitable collaboration, and responsiveness to Kenya's health priorities rather than externally imposed agendas. This balance between global collaboration and local leadership has been central to maintaining community trust and institutional alignment with the hospital's mission of compassionate, evidence-informed care.

Looking forward, AICKH has made 'Becoming a Data-Driven, Innovative Research Hub' one of its nine strategic goals for 2024–2029. This includes expanding into new thematic areas such as maternal and neonatal health, perioperative safety, palliative care, and digital health innovation. Strengthening electronic medical record systems and data analytics capacity will be essential to move from retrospective chart reviews to real-time, prospective research. Creating protected time for clinician-researchers, investing in research administration, and nurturing cross-disciplinary collaborations will help translate findings into policy and practice. For other rural or faith-based hospitals, the AICKH model illustrates that impactful research does not depend solely on high-end technology or funding but on cultivating a culture of mentorship and service-oriented scholarship that aligns scientific inquiry with patient and community wellbeing.

7 Conclusion

The research trajectory of AIC Kijabe Hospital demonstrates that sustained academic excellence is achievable in resource-limited, mission-based settings through strategic partnerships, committed leadership, and investment in local capacity. Over eleven decades, Kijabe has evolved from a primarily service-oriented institution to a regional hub for clinical research and training, producing peer-reviewed studies that provide meaningful contributions to medical science as evidenced by publication breadth and citation metrics. Research success for AICKH may also be measured by the escalating level of engagement by hospital staff and trainees, This transformation has been most rapid in the past 20 years and was driven by integration of research into clinical workflows, the mentorship of emerging clinician-scientists, and a commitment to addressing contextually relevant health challenges. Continued

progress will depend on strengthening data systems, securing sustainable funding mechanisms, and fostering equitable international collaborations that prioritize local leadership. The AICKH experience provides a potentially replicable model for other rural hospitals across sub-Saharan Africa. Ongoing institutional and global support is therefore imperative to ensure that evidence generated from such settings continues to guide policy, enhance patient outcomes, and advance the science of healthcare delivery in low-resource environments.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

JK: Writing – original draft, Conceptualization, Writing – review & editing. PN: Writing – review & editing, Writing – original draft. BA: Writing – original draft, Writing – review & editing. GO: Writing – original draft, Writing – review & editing. AS: Writing – original draft, Writing – review & editing. MA: Writing – review & editing, Writing – original draft. MO: Writing – review & editing, Writing – original draft.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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