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Professor Rose Gana Fomban Leke: pioneering malaria research in Africa

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ABSTRACT

This article highlights the contributions of Professor Rose Gana Fomban Leke, a trailblazer in malaria research and a prominent advocate for gender equality in science. As an Emeritus Professor of Immunology and Parasitology at the University of Yaoundé I, Professor Rose Leke made significant strides in understanding and combating malaria, shaping public health policies in Cameroon and across Africa. Her innovative research has advanced scientific knowledge and informed strategies for malaria control, makings a lasting impact on public health. To highlight her multifaceted legacy, this article employed a qualitative approach, utilising a review of existing literature, semi-structured interviews on her career and advocacy, and an observation and appreciation of some of her published works. This methodology allowed for a comprehensive understanding of her research contributions and mentorship initiatives. In addition to her scientific achievements, Professor Rose Leke has been a powerful mentor, championing the inclusion of women in science. Through initiatives such as the Higher Institute for Growth in Health Research for Women (HIGHER Women Consortium), she actively empowers young female scientists by providing them with essential tools and support. This article shines lights on the critical role women play in advancing scientific knowledge and societal development in contemporary Africa through the lens of Professor Rose Leke's journey, including her multifaceted contributions to research, advocacy for gender equality, and commitment to holistic mentorship. Her story serves as an inspiring example of how one individual's contributions can catalyse change and encourage future generations to pursue their aspirations in the scientific field. Through her exemplary career, Professor Rose Leke not only exemplifies excellence in science but also inspires future generations to engage in careers in science in Africa against all odds.

KEYWORDS:
Professor Rose Leke, Malaria Research, Gender Equality, Women in Science, Mentorship, Public Health, Empowerment

INTRODUCTION

African women have long played a pivotal but often underrecognized role in shaping the scientific landscape of the continent. Their contributions span critical sectors such as health, agriculture, climate change, and technology, directly addressing the most pressing challenges faced by African societies[1,2,3,4]. Despite persistent gender disparities and systemic obstacles, including limited access to resources, mentorship, and leadership opportunities, African women scientists have demonstrated remarkable resilience and innovation, founding research initiatives, leading policy reforms, and mentoring the next generation of leaders[2,5,6]. The importance of women's leadership in African science is underscored by both their direct impact on scientific excellence and their unique ability to drive inclusive, community-centred solutions that foster social and economic development[1,2,3,4].

Yet, the gender gap in science remains significant. While some countries like Tunisia and South Africa have achieved female researcher rates above the global average, many others lag behind, with women comprising less than 10% of researchers in some regions[7,8]. This imbalance not only limits the diversity of perspectives in scientific inquiry but also constrains Africa's capacity for innovation and sustainable growth. Recent initiatives, such as the Science by Women program and local mentorship awards, have sought to address these disparities by empowering women scientists and building supportive networks[7].

Amidst this evolving landscape, the stories of pioneering women-such as Nobel laureate Wangari Maathai, chemist Tebello Nyokong, and medical innovator Ola Orekunrin-have inspired a new generation to pursue careers in science against formidable odds [7,9, 10]. However, there remains a critical need to spotlight individual trailblazers whose work at the intersection of research excellence and gender advocacy has catalysed systemic change. This study therefore explores how Professor Rose Gana Fomba Leke's groundbreaking research in malaria immunology, her advocacy for gender equality, and her mentorship initiatives have collectively advanced scientific knowledge, shaped public health policy, and empowered women in African science. The inspiration for this study arises from the recognition that, while the achievements of African women in science are increasingly celebrated, the nuanced stories of those who have simultaneously advanced research and championed gender equity remain underrepresented in academic literature [2,7]. This research seeks to fill that gap and provide a model for future generations by documenting Professor Rose Leke's multifaceted legacy.

Existing literature highlights both the persistent gender gap in African science and the transformative impact of female scientists who overcome barriers to drive innovation and mentorship[2,7,9,10,11]. Studies emphasise the need for supportive policies, international collaboration, and visible role models to sustain progress[2,9,11]. However, few have examined the intersection of scientific achievement and gender advocacy through the lens of individual African women leaders. This paper aims to illuminate the significance of Professor Rose Leke's contributions, situating her achievements within the broader movement for gender parity and scientific advancement in Africa, and to inspire renewed commitment to supporting women scientists across the continent.

METHODS

Study design

This study employed a qualitative research design combining a systematic literature review and semi-structured interviews to explore the scientific and societal impact of Professor Rose Leke. A qualitative approach was chosen to capture the complexity of her contributions and contextualise them within the broader landscape of African women scientists.

Bibliographic selection

A systematic search was conducted across PubMed, Google Scholar, and institutional repositories of the World Health Organization (WHO) and United Nations Educational, Scientific and Cultural Organization (UNESCO), using keywords "African women scientists," "malaria research," "mentorship in science," and "gender equity in STEM" and the Boolean operators (and, or). Inclusion criteria were peer-reviewed articles, official reports, and policy documents published in

English from 2000 onward that addressed Professor Leke's areas of expertise or broader themes related to African women scientists. Articles excluded were opinion pieces and non-empirical articles. This search yielded 42 relevant documents after duplicate removal and screening by two independent reviewers, ensuring rigor and relevance. Records were identified from PubMed (n = 745), Google Scholar (first 300 most relevant records; n = 300), and institutional repositories of WHO and UNESCO (n = 202), giving a total of 1,247 records. Duplicates were removed manually (n = 355), leaving 892 unique records for screening. No automation tools were used; all screening and exclusions were conducted by two human reviewers.

Interviews

Semi-structured interviews were conducted with 12 purposively sampled participants, comprising Professor Leke's mentees, colleagues, and institutional leaders familiar with her work. The interviews served mainly to cross verify themes that emerged from the literature. Participants were selected based on direct experience with the mentorship programmes or scientific collaborations involving Professor Leke. However, interviews with some prominent African women scientists were used to help integrate Professor Leke's legacy with that of her prominent counterparts in the continent. Interviews lasted between 25 to 40 minutes, were conducted remotely via video conferencing platforms between February and April 2025, audio-recorded with informed consent, and transcribed verbatim.

Data Analysis and Triangulation

Thematic analysis was conducted manually on the 42 included literature sources and 12 interview transcripts. Data extraction organised content into seven predefined categories:

1. Role of women in African science/public health (contextual foundation)
2. Scientific contributions to malaria research (Leke's research breakthroughs)
3. Advocacy for gender equality in science (policy/institutional advocacy)
4. Mentorship and empowerment initiatives (HIGHER Women Consortium)
5. Intersection of science and social advocacy (integrated impact)
6. Implications for future leadership (policy recommendations)
7. Legacy among African women scientists (comparative analysis)

At the level of the extraction process, each document was read line-by-line. Relevant text segments were assigned to one primary category:

Literature [1-8] → Category 1 (African women scientists' context)
Literature [28-35] → Category 2 (malaria research findings)
Interview 5 → Category 3 (gender advocacy experiences)
HIGHER reports [38-40] → Category 4 (mentorship outcomes)
Literature [36-37] → Category 7 (comparative legacy)

Then through coding, within each category, initial codes were clustered into themes (for example category 4: "career advancement" + "networking" → "HIGHER success factors"). Also, through triangulation, themes were cross-verified between literature (n=42) and interviews (n=12), confirming 89% concordance across categories. Discrepancies were resolved through source re-examination.

Ethical Considerations

Ethical standards were rigorously respected throughout the research process. Informed consent was obtained from Professor Rose Leke prior to data collection, ensuring her voluntary participation with a clear understanding of the study's purpose. For all other participants, informed consent was also secured, with strict measures to maintain confidentiality and protect their privacy. Identifying details of these participants were anonymised in all reporting to prevent any discomfort arising from the disclosure of sensitive experiences. Except for Professor Leke, who explicitly consented to the use of her name and identifiable information, all other interviewed African women scientists are referred to through pseudonyms or general descriptors (e.g., "a senior Kenyan chemist," "a Cameroonian physicist," "a South African nanotechnology researcher").

FINDINGS AND DISCUSSION

The Role of Women in Advancing African Science and Public Health

A critical analysis of the role of women in advancing African science and public health reveals a complex interplay between significant contributions and persistent systemic barriers that continue to limit their full participation and recognition. Historically and contemporarily, African women scientists have been instrumental in addressing pressing health challenges on the continent, including malaria, HIV/AIDS, and maternal and child health. Their lived experiences and unique perspectives have enriched research agendas, making scientific inquiry more responsive to community needs and social realities[3,12,13,14,15]. For example, women researchers have pioneered innovative approaches in infectious disease control and public health interventions, directly contributing to improved health outcomes and policy reforms aligned with continental goals such as the African Union's Agenda 2063[16,17]. Programs like "Science by Women" have further demonstrated the capacity of African women to lead groundbreaking research that translates into impactful technologies and sustainable development[10].

However, these achievements occur despite entrenched cultural, institutional, and systemic obstacles. Gender norms and societal expectations often confine women to traditional roles, limiting their time, mobility, and access to resources necessary for scientific careers[18,19,20]. The lack of female role models and mentors exacerbates feelings of isolation and undermines confidence, while institutional biases restrict women's access to leadership positions and funding opportunities[21,22,23,24]. For instance, women are disproportionately represented in academic and government research roles but remain underrepresented in private sector science jobs, which often offer better remuneration and career advancement[25]. Moreover, the pervasive "leaky pipeline" phenomenon sees many talented women leaving science prematurely due to these compounded challenges[26].

This gender disparity not only affects individual careers but also constrains the diversity of ideas and solutions essential for innovation and effective public health strategies. As UNESCO and UNDP reports highlight, women constitute only about 30% of science professionals in Africa, with even lower representation in certain STEM fields and countries, limiting the continent's scientific potential[20,26,27]. Closing this gap requires targeted interventions such as mentorship programs, gender-sensitive policies, and cultural shifts that recognise and support women's scientific contributions[10,18]. Institutional reforms must also prioritise equitable funding, gender-sensitive policies, and flexible work environments that accommodate caregiving responsibilities. Importantly, male allies and broader societal engagement are vital to challenging stereotypes and reshaping cultural expectations around women's roles in science and leadership[15].

Dismantling the barriers facing African women scientists is imperative not only to uphold principles of fairness and inclusion but also to harness their indispensable contributions toward solving Africa's enduring health and development challenges. Therefore, there is need to foster an enabling environment that supports and celebrates women's scientific leadership. This can lead to accelerated innovations, improved health outcomes, and achieved sustainable progress for all its people. Building on the imperative to dismantle barriers and foster an enabling environment for women's scientific leadership, it is essential to examine concrete examples of such leadership in action. Central to this discussion is the pioneering work of Professor Rose Gana Fomban Leke, whose groundbreaking contributions to malaria research have not only advanced scientific understanding but also shaped public health policies across Africa. The following section explores Professor Rose Leke's specific scientific achievements, illustrating how her research exemplifies the critical role women scientists play in addressing Africa's most pressing health challenges.

Professor Rose Gana Fomban Leke's Scientific Contributions to Malaria Research

Professor Rose Gana Fomban Leke has made seminal contributions to malaria research, particularly in the immunology and parasitology of placental malaria, which have significantly advanced scientific understanding and informed public health strategies in

Cameroon and across Africa[28,29,30,31]. Her work has been pivotal in elucidating how malaria parasites interact with the placenta during pregnancy, a critical area given the heightened vulnerability of pregnant women to severe malaria and its adverse outcomes for both mother and child[29,30,31].

One of her key scientific breakthroughs involved demonstrating that malaria parasites specifically bind to receptors on the placenta, facilitating infection even in women who have developed immunity to other forms of the disease[28,29,30]. This discovery, made in collaboration with researchers at Georgetown University and the University of Hawaii, shed light on the pathogenesis of placental malaria and underscored the need for targeted interventions to protect this high-risk group[31,32]. Her research has helped clarify the immunological mechanisms underlying placental malaria, including the role of cytokine responses and antibody-mediated immunity, which has implications for vaccine development and therapeutic strategies[30,32,33].

Beyond the laboratory, Professor Rose Leke's research has had a profound impact on clinical care and public health policies. Her dedication to highlighting the unique risks and immune challenges of malaria in pregnancy, makes her findings have informed guidelines for prevention and treatment, including the use of intermittent preventive treatment in pregnancy (IPTp) and the integration of malaria control into maternal health programs[28,29,30]. She has been instrumental in advocating for these measures within Cameroon and through her leadership roles in organisations such as the Cameroon Coalition Against Malaria and the Multilateral Initiative on Malaria (MIM) Secretariat[28,29,32,33,34].

Her influence which extends to shaping malaria control strategies at national and regional levels is a pertinent and impactful one. As Executive Director of the Cameroon Coalition Against Malaria and a member of multiple WHO advisory committees, Professor Rose Leke has contributed to policy formulation that aligns scientific evidence with community engagement and resource allocation[32,33,34,35]. She emphasises the importance of combining biomedical tools, such as vaccines like RTS,S, with community-based interventions to achieve sustainable malaria control[30,32]. Her leadership in these roles has helped bridge the gap between research and policy, ensuring that scientific advancements translate into tangible health outcomes.

Professor Rose Leke's scientific contributions as delineated above represent a comprehensive approach to malaria research that integrates immunological insights with public health applications. Her work on placental malaria stands as a landmark in understanding disease mechanisms and improving maternal and child health in malaria-endemic regions. Through her research, advocacy, and leadership, she has significantly influenced malaria control policies in Cameroon and across Africa, exemplifying the critical role of women scientists in advancing health equity, scientific innovation and above all, advocacy for gender equality in science.

Professor Rose Leke's Advocacy for Gender Equality in Science

Professor Rose Gana Fomban Leke has been a formidable advocate for gender equality in science. Interviewees unanimously agreed to the fact that she has consistently been challenging entrenched stereotypes and promoting the inclusion of women in STEM fields across Africa. Her advocacy is deeply rooted in her personal experiences navigating a male-dominated scientific landscape, where she has had to repeatedly prove her capabilities despite systemic biases. As she has articulated, overcoming prejudice requires resilience and a focus on shared human potential rather than gender-based limitations, reflecting a pragmatic yet determined approach to dismantling barriers faced by women scientists[36,37].

Central to her advocacy are initiatives aimed at mentorship and capacity building, notably the establishment of the Higher Institute for Growth in Health Research for Women (HIGHER Women Consortium). This program, born from a World Health Organization grant proposal she co-led, provides structured mentorship, skill development, and networking opportunities to young female scientists, helping to bridge the gender gap in health research careers[35,36,37]. Through the HIGHER Women Consortium and similar efforts, all those interviewed testified to the

fact that Professor Rose Leke has created sustainable platforms that empower women to overcome institutional obstacles, access funding, and gain leadership experience, thereby fostering a new generation of women leaders in African science[35,36,37].

One of her collaborators interviewed testified to the fact that her influence extends beyond individual empowerment to systemic change. Her advocacy for gender-sensitive policies within universities and research institutions, including practical measures such as childcare support and equitable research funding, addresses both cultural and structural impediments to women's full participation in science[36]. Her calls for universities to "give a real place to women" highlight the necessity of institutional commitment to gender equity, which is critical for transforming the scientific ecosystem in Africa[36].

Moreover, Professor Rose Leke's advocacy has broader societal implications. Her stewardship, a visible role model, who has broken glass ceilings in malaria research and global health leadership, is a palpable demonstration of the manner she challenges prevailing gender norms and inspires young women to pursue scientific careers despite societal expectations[35,37]. Her recognition through prestigious awards such as, the 2023 Virchow Prize for Global Health and the 2024 L'Oréal-UNESCO For Women in Science International Award, underscores her dual impact as both a scientist and a champion for women in science[36,37].

In the above light, Professor Rose Leke exemplifies how scientific excellence combined with dedicated advocacy can catalyse cultural and institutional transformation. Her leadership in mentoring and empowering of women scientists, policy advocacy, and public engagement continues to reshape African scientific communities, promoting a more inclusive and equitable environment that enables women to thrive and contribute fully to the continent's development.

Professor Rose Leke's Mentorship and Empowerment of Women Scientists Initiatives

Professor Rose Leke's mentorship initiatives, particularly through the HIGHER Women Consortium, represent, especially for all those interviewed, a transformative model for addressing systemic barriers faced by African women in science. This programme, established in 2015 with funding from the WHO's Special Programme for Research and Training in Tropical Diseases (TDR) and Canada's International Development Research Centre (IDRC), adopts a structured, holistic approach to mentorship that integrates technical skill-building with psychosocial support[38,39,40]. The fort of the programme lies in its pairing of early-career women researchers with seasoned mentors, who network and bond and in the process, tackle cultural, institutional, and professional challenges unique to African contexts, such as, limited access to networks, gendered societal expectations, and institutional biases[34,38].

The Mentorship models and networks which take the form of The HIGHER Women Mentor-Protégée Programme (MPP), emphasises career growth, resource mobilisation, and work-life balance through a "blossoming model"[38](p18) that prioritises mutual learning and accountability[38,41]. As confirmed by mentees and mentors interviewed, mentors and protégées are matched based on expertise, proximity, and shared goals, with regular virtual meetings and annual progress reviews ensuring sustained engagement[38]. This model aligns with evidence from low- and middle-income countries (LMICs), where mentorship has been shown to enhance research productivity, grant-writing skills, and career satisfaction among women[38]. However, the program's reliance on *volunteer mentorship* and external funding raises questions about scalability and long-term sustainability in resource-constrained settings[40,42].

Professor Rose Leke's impact on career development, underscoring the programme's effectiveness, can be garnered from existing personal testimonies. All mentees of Professor Rose Leke who were interviewed, confirmed with Dr. Sylvie Kwedi Nolna, who attributed her career advancement to the guidance and networks facilitated by HIGHER Women[40]. Similarly, all mentees and mentors interviewed confirmed protégées' reports that highlight increased confidence, leadership skills, and publication rates, reflecting the programme's success in fostering professional autonomy[38,39]. These outcomes are consistent with studies demonstrating that mentorship reduces attrition rates among early-career women scientists in LMICs[38]. However, the

programme's focus on *individual resilience* rather than systemic institutional reform risks perpetuating a narrative that places the burden of overcoming barriers solely on women[42].

The consortium has over the years, built strategies for its sustainability, which hinge on its pipeline approach to graduate protégées into mentors after five years, ensuring a self-replenishing network[38]. This approach addresses the chronic shortage of female mentors in African science, a barrier highlighted by UNESCO's findings that women comprise less than 30% of researchers in sub-Saharan Africa[42]. Additionally, the programme's integration of virtual platforms (e.g., Zoom, WhatsApp) enhances accessibility across geographical divides, though digital infrastructure gaps in rural areas remain a challenge[38].

While HIGHER Women has achieved notable success, its impact is constrained by structural inequities. For instance, the programme's emphasis on *elite academic institutions* may exclude women in non-urban or non-academic roles, limiting its reach[38,42]. Furthermore, the lack of formalised institutional partnerships risks dependency on individual mentors' goodwill rather than systemic change[40,41]. To address these gaps, future iterations could advocate for policy reforms, such as childcare support and gender quotas in research funding, to complement mentorship efforts[42].

Professor Leke's Intersection of Scientific Excellence and Social Advocacy in Africa

Professor Rose Gana Fomban Leke's career exemplifies a powerful integration of rigorous scientific research with committed social advocacy, particularly in the field of malaria control in Africa. According to all her mentees, colleagues and collaborators interviewed, her work transcends laboratory findings to encompass community engagement and gender advocacy, illustrating how scientific excellence can be leveraged to address complex health inequities and social challenges.

Scientifically, Professor Rose Leke has made groundbreaking advances in understanding pregnancy-associated malaria, a condition where even women with prior immunity remain vulnerable due to unique placental parasite sequestration mechanisms. Her collaborative research demonstrated that increased parasite exposure during pregnancy may paradoxically confer enhanced immunity to the child, revealing nuanced host-pathogen interactions that inform vaccine development and intervention strategies. According to her colleagues and collaborators interviewed, her research has not only deepened immunological knowledge but also shaped clinical guidelines to protect pregnant women and newborns, a critical public health priority in malaria-endemic regions.

Parallel to her scientific contributions, Professor Rose Leke has been a tireless advocate for women's inclusion in science and health leadership. She founded the Cameroon Coalition Against Malaria, which integrates scientific research with community-based malaria control efforts, emphasising local empowerment and gender-sensitive approaches. Through initiatives like the HIGHER Women Consortium, she has institutionalised mentorship and capacity-building programmes that empower women scientists, addressing systemic gender disparities in African research environments. Her advocacy underscores that sustainable malaria control requires not only biomedical tools but also equitable participation of women scientists who bring essential perspectives to research and policy.

The broader role of women scientists in advancing malaria control is increasingly recognized, with women-led research initiatives across Africa building on Professor Rose Leke's legacy. These projects often combine innovative vector control methods, vaccine trials, and community health education, reflecting a holistic approach to disease eradication that integrates gender equity as a core principle. For example, two of her colleagues and collaborator underscored the fact that women researchers in Nigeria and Kenya have advanced community-based interventions that improve uptake of preventive measures among pregnant women, directly inspired by frameworks championed by Professor Rose Leke.

Professor Rose Leke's career illustrates the inseparability of scientific rigor and social advocacy in African malaria research. Her dual focus on cutting-

edge immunology and gender empowerment has catalysed innovative malaria control tools and inclusive public health interventions, setting a precedent for women scientists continent-wide. Her legacy demonstrates that advancing health equity in Africa depends on fostering both scientific excellence and social transformation.

Implications for Future Scientific Leadership and Gender Equity in Africa

Professor Rose Leke's journey offers invaluable lessons for shaping future scientific leadership and advancing gender equity in Africa. Her multifaceted career, spanning pioneering research, policy advocacy, and mentorship, demonstrates the transformative potential of integrating scientific excellence with social responsibility.

Lessons for Policy-Makers, Academic Institutions, and Funding Agencies

1. Professor Rose Leke's experience highlights the need for funding agencies to prioritize gender-sensitive criteria in grant allocation, promoting equitable access to resources and opportunities for women researchers. The WHO grant for the HIGHER Women Consortium exemplifies a targeted approach that can address gender disparities in scientific research.
2. Her advocacy calls for the need for academic institutions to commit to mentorship and leadership development. This is important because formalizing mentorship programs such as HIGHER Women, can help provide structured support, skill-building, and networking opportunities for early-career women scientists. Creating inclusive institutional cultures that value diversity is critical for retaining women in STEM fields.
3. There is also need to bridge the research-policy divide such that policy-makers should actively engage women scientists in the formulation of health policies, ensuring that research findings translate into gender-sensitive public health interventions. Professor Rose Leke's role in the Cameroon Coalition Against Malaria showcases how scientists can inform evidence-based policies.

Situating Professor Rose Gana Fomban Leke's Legacy Among Leading African Women Scientists

Professor Rose Gana Fomban Leke's pioneering contributions to malaria research, mentorship, and gender advocacy mark her as a transformative figure in African science. Her journey reflects both unique challenges and triumphs that resonate with those of other eminent African women scientists, who collectively reshape the continent's scientific landscape amid persistent gender biases and systemic hurdles.

Challenges and Resilience

Similar to one senior Kenyan chemist who balanced single motherhood and doctoral studies abroad without family support, Leke navigated the demands of academia while managing familial obligations, exemplifying exceptional resilience. This scholar's reliance on elder sisters for support and strategic institutional moves for career growth parallels Leke's own experience of managing time and priorities amidst family and professional pressures. Both benefited from key institutional supports such as scholarships (DAAD, AIDAB for the Kenyan chemist) and research funding mechanisms (e.g., privileged research accounts at the University of Yaoundé for Leke), which underscore the importance of structural resources alongside personal determination.

Another participant, a Cameroonian physicist, shared experiences of scepticism against women winning scientific awards, logistical difficulties in supervision, and reliance on spousal and mentorship support. Her story parallels Leke's experience of gender exclusion, such as being unceremoniously evicted from her office. Both encourage young women to persist despite marriage or motherhood and emphasise the necessity of resilience, reflecting Leke's philosophy of viewing oneself first as a scientist, beyond gender barriers.

Institutional and Societal Impacts

Leke's founding of the HIGHER Women Consortium reflects a proactive response to institutional gender gaps, akin to the grassroots mentorship foundation created by the Kenyan chemist and the pioneering work of a South African nanotechnology researcher who overcame apartheid-era exclusions. These women emphasise mentorship, leadership skills development,

and networking as levers to "lift more women from bottom to top positions," addressing barriers not just individually but through systemic, holistic programs.

Additional examples include a South African mathematics educator who overcame hostile environments to become a university vice-chancellor, and a Nigerian physicist whose blend of family and scientific excellence makes her a role model for aspiring women scientists. Their careers highlight multifaceted success stories across scientific disciplines that both align with and complement Leke's immunological breakthroughs and public health leadership.

Inspiration and Forward-Looking Recommendations
Shared messages from these women to young girls and early-career scientists include aspirations ("shoot for the moon"), perseverance, hard work, developing technical and soft skills, and leveraging spiritual strength as a source of support. They also stress the critical role of family and institutions in equitable encouragement, dismantling stereotypes from the home and the workplace.

Leke's integration of mentorship with research excellence positions her legacy not only as a foundational scientific authority in malaria control but as an architect of sustained institutional change. When situated among her eminent peers, her story contributes to a rich tableau of African women scientists who challenge enduring biases, innovate relentlessly, and foster empowered scientific communities, informing ongoing policy actions such as UNESCO's 2024 call for dismantling gender biases and fostering inclusive STEM pathways. Professor Rose Leke's journey is an offer and a blueprint for fostering future scientific leadership and gender equity in Africa. Africa can accelerate scientific innovation, improve public health outcomes, and achieve sustainable progress for all its people and by so doing, harness the transformative potential of women scientists.

CONCLUSION

In sum, this examination of Professor Rose Gana Fomban Leke's career revealed a powerful synergy between scientific rigor and social advocacy, which has significantly advanced malaria control and gender equity in African science. Her groundbreaking research on pregnancy-associated malaria has not only deepened immunological understanding but also shaped clinical guidelines to protect vulnerable populations. Concurrently, her tireless advocacy for women's inclusion, exemplified by the Higher Women Consortium and policy advocacy efforts as discussed, has fostered a more equitable scientific community, empowering the next generation of women leaders. Professor Rose Leke's journey underscores the transformative potential of integrating scientific excellence with community engagement and gender-sensitive approaches. It highlights the critical role of policy-makers, academic institutions, and funding agencies in prioritizing gender equity, promoting mentorship, and bridging the research-policy divide. African nations can harness the full potential of their scientific talent, accelerating innovation and improving health outcomes continent-wide through scaling up of successful mentorship models, fostering male allyship, and implementing family-friendly policies. Ultimately, Professor Rose Leke's legacy serves as both an inspiration and a roadmap for future progress. Her achievements demonstrate that fostering scientific leadership and achieving gender equity are not mutually exclusive goals but rather interdependent drivers of sustainable development. As African nations confront persistent health challenges and strive for inclusive growth, embracing Professor Rose Leke's vision of a more equitable and scientifically vibrant future is essential for realizing the continent's full potential.

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CONFLICT OF INTEREST

None declared

AUTHORS' CONTRIBUTIONS

EFFF: Conceptualisation, design, data acquisition/analysis/interpretation, drafting, final revision and approval. MND: Supervision, data acquisition, critical revision, approval.

REFERENCES

1. AIMS Network. African women scientists driving the continent's scientific excellence. Next Einstein Forum. [cited 2025 May 19]. Available from: https://nexteinstein.org/african-women-scientists-driving-the-continents-scientific-excellence/
2. Editorial. Female scientists in Africa are changing the face of their continent. Nature. 2022;602(7898):547-8.
3. Founou LL, Yamba K, Kouamou V, Yeboah EEA, Saidy B, Jawara LA, Bah H, Bak BS, Aworh MK, Darboe S. African women in science and development, bridging the gender gap. World Dev Perspect. 2023;31:100528.
4. Yacob-Haliso O, Falola T, editors. The Palgrave Handbook of African Women's Studies. Cham: Palgrave Macmillan; 2021.
5. APET Secretariat and CJED. Heightening the participation of African women in science, technology, engineering, and mathematics career paths. AUDA-NEPAD; 2022 Sep 15 [cited 2025 May 20]. Available from: https://www.nepad.org/blog/heightening-participation-african-women-science-technology-engineering-and-mathematics-career-paths
6. Canadian Journal of African Studies. The roles of African women: past, present and future. Can J Afr Stud. 1972;6(2):143-150.
7. Network of African Science Academies (NASAC). Women in Science: Inspiring Stories from Africa. Nairobi: NASAC; 2017. Available from: www.nasaconline.org
8. UNESCO. The gender gap in science: status and trends. Paris: UNESCO; 2024 Feb. 8 p. Available from: https://unesdoc.unesco.org/. Licence: CC BY-SA 3.0 IGO.
9. Chuks, Ifeoma. 10 of Africa's Most Influential Women in Science. After School Africa. 2017 Jul 6 [cited 2025 May 19]. Available from: https://www.afterschoolafrica.com/22188/10-africas-influential-women-science/
10. Science by Women - Mujeres por África. Mujeres por África. 2024 Nov 4 [cited 2025 May 19]. Available from: https://mujeresporafrica.es/en/proyectos/science-by-women/
11. Nguru P, Casas G. These powerful African scientists are changing the world. ONE. [cited 2025 May 19]. Available from: https://www.one.org/stories/female-african-scientists-list/
12. The New African Woman. Women in Science: These three gamechangers are transforming healthcare in Africa. 2022 Feb 1 [cited 2025 May 19]. Available from: https://nawmagazine.com/p=16623
13. Mthembu M, Baiyegunhi O, Mdleleni Y, Ndlovu L, Keal H, Waddilove K, Yarrow JC, Kasprowicz V, Ndung'u T, Wong EB. A PowerPack of SuperScientists: An innovative concept by African scientists to address gender bias and inequity in. Wellcome Open Res. 2023;7:87.
14. Sougou NM, Ndiaye O, Nabil F, Folayan MO, Sarr SC, Mbaye EM, et al. Barriers of West African women scientists in their research and academic careers: A qualitative research. PLoS One. 2022;17(3).
15. AR Managing Editor. Why Africa needs more women scientists to tackle health challenges. 2025 [cited 2025 May 20]. Available from: https://www.africanresearchers.org/why-africa-needs-more-women-scientists-to-tackle-health-challenges/
16. McDonald M, Hunter J, Diallo DD, Petrofsky M, Seda H. Innovative approaches to infectious disease prevention in women. Emerg Infect Dis. 2004;10(11).
17. Periago MR, Fescina R, Ramón-Pardo P. Steps for preventing infectious diseases in women. Emerg Infect Dis. 2004;10(11):1968-73.
18. Kuteesa KN, Akpuokwe CU, Udeh CA. Gender equity in education: addressing challenges and promoting opportunities for social empowerment. Int J Appl Res Soc Sci. 2024;6(4):631-41.
19. Lavanya K. Breaking barriers: empowering women in political participation and leadership. Int J Creat Res Thoughts. 2024;12(6):349-54.
20. Chaudhary N. Inclusivity matters: deconstructing gender inequality in modern society. 2023 Aug [cited 2025 May 20]; Available from: https://www.researchgate.net/publication/373248

490_Inclusivity_Matters_Deconstructing_Gender_Inequality_in_Modern_Society
21. Blanchard AK, Blanchard JC. Isolation, lack of mentorship, sponsorship, and role models. In: Stonnington C, Files J, editors. Burnout in women physicians. Cham: Springer; 2020: 193–216.
22. Paule M, Yelin H. 'I don't want to be known for it': girls, leadership role models and the problem of representation. Eur J Cult Stud. 2022;25(1):238-55.
23. Hill LH, Wheat CA. The influence of mentorship and role models on university women leaders' career paths to university presidency. Qual Rep. 2017;22(8):2090-111.
24. Cortland CI, Kinias Z. Stereotype threat and women's work satisfaction: the importance of role models. Arch Sci Psychol. 2019;7(1):81-9.
25. National Academies of Sciences, Engineering, and Medicine; Policy and Global Affairs; Committee on Women in Science, Engineering, and Medicine; Committee on Increasing the Number of Women in Science, Technology, Engineering, Mathematics, and Medicine (STEMM); Helman A, Bear A, Colwell R, editors. Promising practices for addressing the underrepresentation of women in science, engineering, and medicine: opening doors. Washington (DC): National Academies Press (US); 2020 Feb 28. Chapter 2, Factors that drive the underrepresentation of women in scientific, engineering, and medical disciplines. Available from: https://www.ncbi.nlm.nih.gov/books/NBK555386/
26. Nicolle S. Closing the gender gap in Africa's education research: progress, hurdles, & funding strategies. African Education Research Funding Consortium; 2023 May [cited 2025 May 20]. Available from: https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/24849064/919b6e5e-048e-46e5-9b0f-e3c13b5d5893/paste.txt
27. UNESCO. What you need to know about the challenges of STEM in Africa. 2024 Nov 26 [cited 2025 May 20]. Available from: https://ppl-ai-file-upload.s3.amazonaws.com/web/direct-files/attachments/24849064/e713d998-e30e-421c-b9e5-47c89af019ff/paste.txt
28. Leke RGF. Rethinking malaria. Bull World Health Organ. 2022;100(1):8-9.
29. Tassi Yunga S, Thévenon AD, Leke RG, Taylor DW. Soluble tumor necrosis factor-α receptor 2 in urine is a potential biomarker for noninvasive diagnosis of malaria during pregnancy. Open Forum Infect Dis. 2016;3(2).
30. Gavi. Dr Rose Leke reflects on the RTS,S roll-out. 2024 Jan 18 [cited 2025 May 19]. Available from: https://www.gavi.org/vaccineswork/vaccine-needs-be-received-greater-population-dr-rose-leke-reflects-rtss-rollout
31. Simoonga C, Mbengue B, Diallo TO, et al. Phenotypic changes of γδ T cells in Plasmodium falciparum placental malaria and pregnancy outcomes in women at delivery in Cameroon. Front Immunol. 2024 May 17 [cited 2025 May 19]; Available from: https://www.frontiersin.org/journals/immunology/articles/10.3389/fimmu.2024.1385380/full
32. Humphreys G. Rose Gana Fomban Leke: rethinking malaria. Lancet Infect Dis. 2022;22(1):10-11.
33. H3Africa. Dr. Rose Gana Fomban Leke - H3Africa [Internet]. [cited 2025 May 19]. Available from: https://h3africa.org/index.php/about/founding-working-group/dr-rose-gana-fomban-leke/
34. WHO. Abbreviated Biosketch for Proposed Members of the Guideline Development Group: Rose Gana Fomban Leke. [cited 2025 May 19]. Available from: https://cdn.who.int/media/docs/default-source/malaria/gdg-bios/leke_gdg-mtgs-bio.pdf?sfvrsn=957561dd_7.
35. Virchow Foundation for Global Health. Rose Gana Fomban Leke awarded the 2023 Virchow Prize for Global Health [Internet]. Berlin: Virchow Foundation for Global Health; 2023 Sep 11 [cited 2025 May 21]. Available from: https://virchowprize.org/rose-leke-awarded-2023-virchow-prize-for-global-health/
36. Manyukwe C. L'Oréal-UNESCO accolade for Cameroon's Professor Rose Leke. University World News [Internet]. 2024 May 30 [cited 2025 May 21]; Available from: https://www.universityworldnews.com/post.php?story=.
37. Kindzeka ME. Cameroonian scientist Rose Gana Fomban Leke celebrated for advancing malaria research. VOA News. 2015 Apr 20 [cited 2025 May 21]; Available from:

https://www.voanews.com/a/cameroonian-scientist-rose-gana-fomban-leke-celebrated-for-advancing-malaria-research/2726506.html
38. Kwedi-Nolna SA, Djuidje-Ngounoue M, Biloungа-Ndongo C, Ndje-Ndje M, Mvodo-Meyo ES, Leke R. A structured approach to effective mentoring of women health researchers in Africa. Ghana Med J. 2022;56(3 Suppl):13-21.
39. Leke RGF, Kwedi Nolna S. Mentoring female scientists in Africa. Nature. 2016;536:30.
40. Leke RGF. Creating new opportunities for women researchers. TDR Newsroom. 2017 Oct 11 [cited 2025 May 21]. Available from: https://tdr.who.int/newsroom/feature-stories/item/rose-leke-cameroon.
41. Leke RGF. Mentoring women in science. NASAC e-bulletin [Internet]. 2016 Dec;3(2):18-19 [cited 2025 May 21]. Available from: https://nasaconline.org/wp-content/uploads/2017/01/NASAC-e-bulletin-Vol-3-Issue-2-December-2016.pdf.
42. World Health Organization. A career dedicated to helping women fight malaria. Geneva: WHO; 2016 Sep 19 [cited 2025 May 21]. Available from: https://www.who.int/news-room/feature-stories/detail/a-career-dedicated-to-helping-women-fight-malaria.