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CONTEMPORARY REVIEW

Pediatric and Congenital Cardiac Services: An Innovative and Empowering Approach to Global Training and Equitable Care

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ABSTRACT: Congenital heart disease is a leading cause of preventable death in children, with a disproportionate impact on low- and middle-income countries. Despite progress in treating congenital heart disease globally, significant challenges remain in accessing specialized cardiovascular care, particularly cardiac surgery, in low- and middle-income countries. This review examines current models of assistance and proposes a novel global training program to address these inequities. Key challenges identified include building program infrastructure, training health care providers, ensuring financial sustainability, and promoting local engagement. The proposed program, structured under a new international organization, will leverage emerging technologies to deliver accessible and rigorously assessed training in pediatric and congenital cardiac care. By collaborating with local experts and global partners, the program will promote access to education for various health care personnel involved in congenital heart disease care, establish credentialing standards, and foster global collaboration. This unified, scalable approach aims to bridge the health equity gap and accelerate progress toward comprehensive and sustainable cardiac care programs worldwide.

Key Words: cardiac surgery ■ congenital heart disease (CHD) ■ global health training ■ health equity ■ low- and middle-income countries (LMIC)

Congenital heart disease (CHD) poses a significant global health challenge, affecting an estimated 1.8% of live births based on recent studies.[1–3] Of these, one third (0.6% of live births) require early surgical or interventional catheterization due to moderate to severe CHD, whereas others may require intervention later during childhood or adult life.[1,2] CHD is the leading cause of preventable death among children under age 5 with birth defects, accounting for >260 000 global deaths in 2017, with a disproportionate impact on children under 1 year of age in low- and middle-income countries (LMIC).[4,5] The disparity in mortality rates between LMIC and high-income countries has continued to widen between 1990 and 2019.[3,6]

Despite the need for early intervention, access to essential cardiac care remains limited in LMIC.[7,8] This disparity is particularly concerning given the growing burden of both CHD and acquired heart diseases in these regions as a result of rapidly growing populations. Unattended risk factors in childhood can also have lasting consequences, including the development of adult-onset cardiovascular diseases such as

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Nonstandard Abbreviations and Acronyms

LMIC	low- and middle-income countries
NGO	nongovernmental organization
SSC	South–South cooperation

coronary artery disease.[9] Additionally, LMIC face a significant burden of acquired heart disease with origins in childhood, notably rheumatic heart disease, which accounts for over 300 000 annual deaths and typically begins with acute rheumatic fever in childhood.[10]

Historically, investments in specialized pediatric care, such as congenital cardiac care, have been deprioritized in LMIC due to the greater burden of "high prevalence" conditions such as malnutrition and infectious diseases.[11] However, the global epidemiological shift toward an increased burden of chronic diseases, including congenital malformations, justifies a reevaluation of this approach in many regions.[12] Investing in specialized pediatric care not only addresses immediate needs but also strengthens overall health care systems and contributes to long-term health outcomes in these populations.

The lack of access to care is stark, with a minority of children in LMIC being able to reach pediatric and congenital cardiac care and 90% of children in LMIC lacking access to essential cardiac surgery (Figure 1).[7,8] This paper aims to address this inequity by examining current models of assistance and cooperation in pediatric and congenital cardiac care, identifying key challenges and potential solutions. We present an innovative program focused on training and credentialing health care personnel in LMIC by leveraging emerging technologies. With the involvement of local and global partners, we propose the establishment of an international organization to develop and implement a global training strategy for pediatric and congenital cardiac care that meets global benchmarks, prioritizes accessibility, and includes a rigorous assessment process.

EXISTING MODELS OF ASSISTANCE AND COOPERATION

There are 3 well-established models of assistance and cooperation in caring for children with congenital or acquired heart disease in LMIC: (1) financial assistance, (2) visiting teams, and (3) commitment to capacity building.[13,14] Each model has distinct strengths and weaknesses, with variations and combinations of the models often employed (Table).

South–South Cooperation Model

In addition to the traditional models of assistance that involve high-income countries, a growing number of programs operate under a "South–South Cooperation" (SSC) model. SSC involves the transfer of knowledge, skills, or technology between developing countries, also known as countries of the Global South.[15] Examples of successful SSC models include the established centers for pediatric and congenital cardiac care in Guatemala,[16] Egypt,[17] Namibia,[18,19] and other sub-Saharan African countries.[20,21] With the SSC model, care centers not only serve as regional hubs for excellence but also provide specialized training to health care providers and personnel from neighboring countries.[22–24] Despite their growing numbers, the sustainability and reproducibility of these centers remain challenging. There are multiple reasons for poor health care access in LMIC, including lack of political commitment, maldistribution of resources (especially financial support), inadequate human resources, and lack of persistence.[22,24,25] In addition to addressing these issues of access, the SSC model has also fostered valuable research training and mentoring relationships.[26]

CHALLENGES AND OPPORTUNITIES IN EXISTING AND FUTURE MODELS

Building Program Infrastructure

Despite considerable progress in the field of global pediatric and congenital cardiac care over the past half-century, substantial challenges remain across all models of assistance. In 2023, recognizing the potential of collaborative efforts, thought leaders in global pediatric cardiac care published a set of recommendations to guide program development in LMIC.[27] This tiered framework, emphasizing coordinated education, screening, care delivery, and quality improvement within a cohesive health care system, aims to enhance and accelerate program development. However, a scalable model that expedites the training and credentialing of specialized health care personnel remains a pressing need.

The persistent lack of access to cardiac surgery continues to contribute significantly to the global burden of pediatric and congenital heart disease. With approximately 4 cardiac centers per 10 million population in LMIC and >100 countries lacking a single center or surgeon, even for adults with heart disease, the need for robust infrastructure is evident.[28]

A report of documented activity since 2015 showed that 81 nongovernmental organizations (NGOs) had performed pediatric cardiac surgery in LMIC, with efforts focused only on children in 56 instances (trips) and on both adults and children in 25.[28] However, their impact is often limited to short-term benefits for host institutions, with minimal capacity building and inconsistent follow-up care for patients. As a result, the focus of global assistance has shifted toward

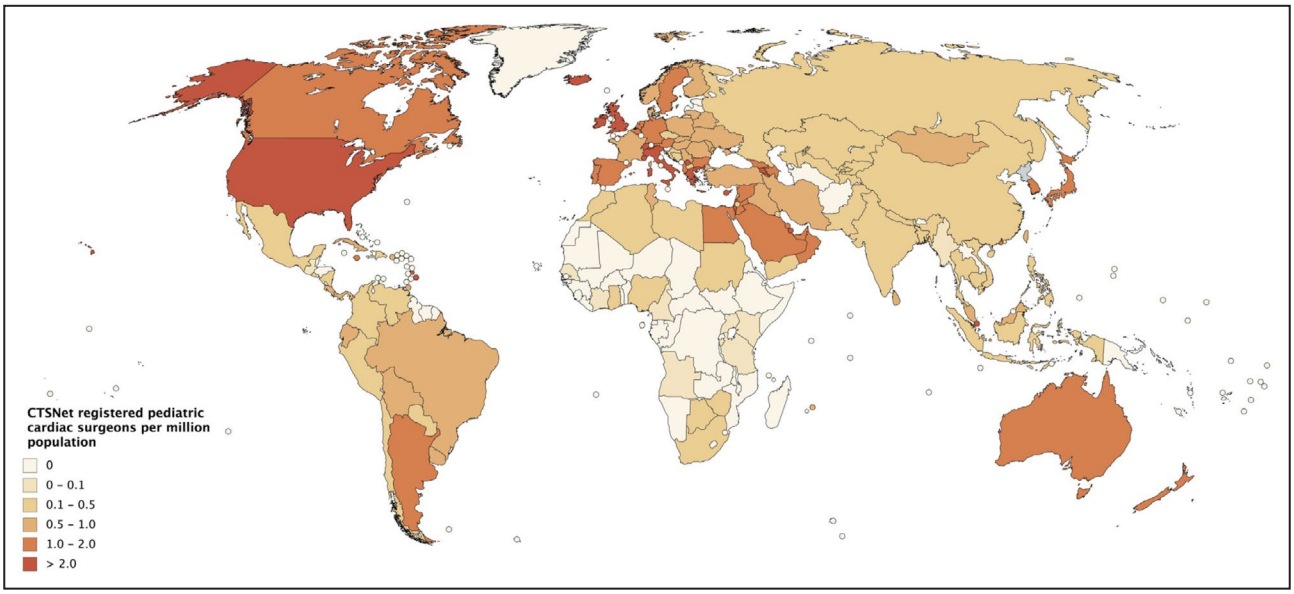

Figure 1. Pediatric cardiac surgeons per million population (registered with CTSNet in August 2017, n=3858).
Map created at www.mapchart.net. CTSNet indicates Cardiothoracic Surgery Network. Reprinted from Vervoort et al.[8] with permission. Copyright ©2020, Elsevier.

establishing sustainable centers for comprehensive care in LMIC, with an increasing emphasis on capacity building through training and tiered program development.[14,27,29]

Accessibility and Scalability of Training Programs

Adequately addressing the needs of children with cardiac disease necessitates training a substantial number of physicians, nurses, and allied health personnel. Better coordination and resource-sharing among international organizations could accelerate this process. Pooling resources to develop and rigorously evaluate CHD teaching materials tailored for LMIC learners could significantly enhance capacity development.[30,31] Although open-access educational platforms like Heart University and SURGhub offer a valuable starting point, their impact can be limited by internet access barriers and the lack of validation for some materials, as well as not being intended to serve as complete subspecialty curricula.[32,33]

Emerging technologies such as simulation, virtual and augmented reality, and artificial intelligence also present an opportunity to revolutionize the global education of physicians, nurses, and other health care personnel. The development of a scalable educational process incorporating these technologies could accelerate training at all levels while addressing local and regional needs. A new, innovative approach to global training aimed at maximizing the impact of investments in pediatric and congenital cardiac care will be explored in subsequent sections.

Financial Sustainability and Local Engagement

One of the most significant challenges in global pediatric and congenital cardiac care is funding. Most NGOs rely heavily on medical volunteers and general volunteers for fundraising efforts.[14] Limited funding and competition for philanthropic support necessitate the exploration of diverse and sustainable financial models, incorporating tuition fees, government subsidies, philanthropy, and public–private partnerships.[18,19,34]

Public–private partnerships have been proposed as a comprehensive, "whole-of-system" approach to address public health concerns in LMIC.[33] Successful examples include a hybrid model in Mexico City that integrated a novel funding model through a local NGO and a "twinning program" with a well-established center from a high-income country.[35] Another noteworthy example is the population-based program in Kerala, India, which significantly reduced infant mortality through early identification, referral, and treatment of infants with CHD, by leveraging a combination of NGO facilitation and local public funding.[36]

Although funding is essential, educational efforts must be integrated with a commitment to capacity building at local and regional levels. Successful capacity building requires alignment between the goals and resources of regional and international partners, with clearly defined roles and responsibilities for each stakeholder.[37] Addressing inequities in global health funding is paramount to achieving equitable and sustainable outcomes.

Table. Examples of Models to Establish and Strengthen Pediatric Cardiac Services in Low- and Middle-Income Countries

Existing model	Brief description	Strengths	Limitations
Financial assistance and care abroad	Transport a child (or family) for medical care abroad	• Comprehensive care at a center of excellence • Minimal additional effort for clinical team	• High cost • Administrative barriers (e. visa permits) • Few children treated • Separation (or displacement) of a family • Typically focused on pediatric age group • No educational opportunities • May undermine the development of local programs
Visiting teams	Fly-in, fly-out a medical team to perform cardiac procedures, including open heart surgery, in LMIC	• High standard of care • Bedside and short-term teaching available • Team relationships and exposure to standardized practices	• High cost • Highly dependent on volunteers • Small number of children treated • Typically focused on pediatric age group • Limited complexity and duration of treatment • Lack of family home care teaching • Lack of patient follow-up • Limited educational opportunities • May disrupt the work or undermine the development of local programs
Commitment to capacity building	Long term collaboration to develop a center of excellence for pediatric and congenital cardiac care in LMIC	• Focus on training and quality improvement • Results in a sustainable center that can provide on-going pediatric and congenital cardiac services • Results in a center that can train additional health care personnel	• Significant resources required to develop a single center • Requires a long-term commitment (up to 10y) • More effective in countries with established infrastructure • May lead to a hierarchal and unbalanced relationship between teams • Best when integrated into national policies and health systems with diverse stakeholders including government

LMIC indicates low- and middle-income countries.

Local and Global Advocacy

Advocacy plays a pivotal role in developing sustainable programs for global pediatric and congenital cardiac care. Both local and global advocacy efforts are essential for improving the quality and availability of graduate medical education programs and other health care personnel training. Local advocacy can effectively highlight programs within specific communities or regions, partnering with individuals and institutions to address unique needs and challenges. Local advocates play a crucial role in ensuring the creation and adoption of appropriate objectives and outcome measures.

In a complementary manner, global advocacy focuses on ensuring that medical and health care personnel education programs meet the needs of patients and their families worldwide. This includes collaborating with existing NGOs to enhance their graduate medical and nursing education programs, providing support to families and health care providers and personnel in LMIC, and maintaining international quality improvement collaboratives.[38–40] In line with the 2030 Sustainable Development Goals, the UNICEF Progress on Children's Well-Being report recommends a "One Plan, One Budget" approach to ensure healthy lives and reduce inequities within and among countries.[41]

The coordination of local and global advocacy efforts to improve access to medical and nursing education is essential to closing the health equity gap in pediatric and congenital cardiac care. The global community must prioritize building program infrastructure, increasing access to training, and creating financially sustainable models to support the development of centers of excellence in LMIC. By embracing cooperation and collaboration, we can accelerate progress toward health equity for children with congenital and acquired heart disease worldwide.

A New International Organization

A newly formed international organization is proposed to focus on ensuring equitable access to high-quality pediatric and congenital cardiac care by training and empowering local health care professionals. Establishing a new working group or organization is a complex decision, as existing programs in LMIC require ongoing support and funding. Significant resources will be needed to establish an organization dedicated to global training. Success hinges on both regional and global support for the sustainability of any international training program, where the benefits of standardization and scalability must outweigh the costs. This envisioned international organization will take a "bottom-up" as well as "top-down" approach to addressing the personnel shortage problem (Figure 2).

The new organization will recruit educators, technology innovators, individuals familiar with challenges due to resource limitations, and individuals skilled in

finance and advocacy. Experts in providing care and building programs in LMIC—gathered from around the world and, importantly, having considerable representation from LMIC health care professionals—will meet regularly to share ideas, amplify the efforts of their respective groups, and work collaboratively to address the growing inequities of care. Partnering with local experts, regional institutions, and government agencies, the new international organization could have the following goals:

1. Conduct a comprehensive survey to identify gaps in LMIC pediatric and congenital cardiac care training programs
2. Establish a resource-efficient, accessible graduate medical education program with rigorous assessment
3. Develop comprehensive training programs for health care providers in LMIC, collaborating with government agencies and NGOs to enhance their capabilities and implement a data-driven quality improvement program
4. Advocate for increased resources and policy changes that support training, innovation, and access to care in LMIC
5. Develop regional models of pediatric and congenital cardiac care integrated into existing LMIC health care systems
6. Foster collaboration and knowledge exchange between LMIC professionals and international organizations

INNOVATIVE APPROACH TO GLOBAL TRAINING

Principles of Frugal Education

Frugal innovation, often described as "essential in environments of necessity,"[42] aims to achieve more with less. In the context of goods and their production, this typically involves reducing complexity and cost; this is usually achieved through the limited use of resources, reuse of existing components, adoption of cost-effective technology, and simplification of design.[43] Inherent to the complexity of cardiovascular care, frugal innovation has been broadly applied to surgical and nonsurgical care for cardiovascular disease in LMIC.[44] By applying these principles to medical education, we can address the challenges of delivering high-quality training in resource-challenged settings.

Frugal education, an extension of frugal innovation, is defined as "resource efficient" in the medical and health care personnel education context. This does not imply low cost or low quality. The principles of frugal education encompass designing with an open mind through a creative and collaborative approach that involves the target audience; leveraging existing resources; and starting small, building quickly, and keeping it lean. This approach emphasizes an iterative process of prototyping and refinement.[45] Frugal innovation can enhance the accessibility of medical and health care personnel education by promoting creative and resource-efficient solutions. Resource efficiency, combined with a focus on quality, can also reduce the

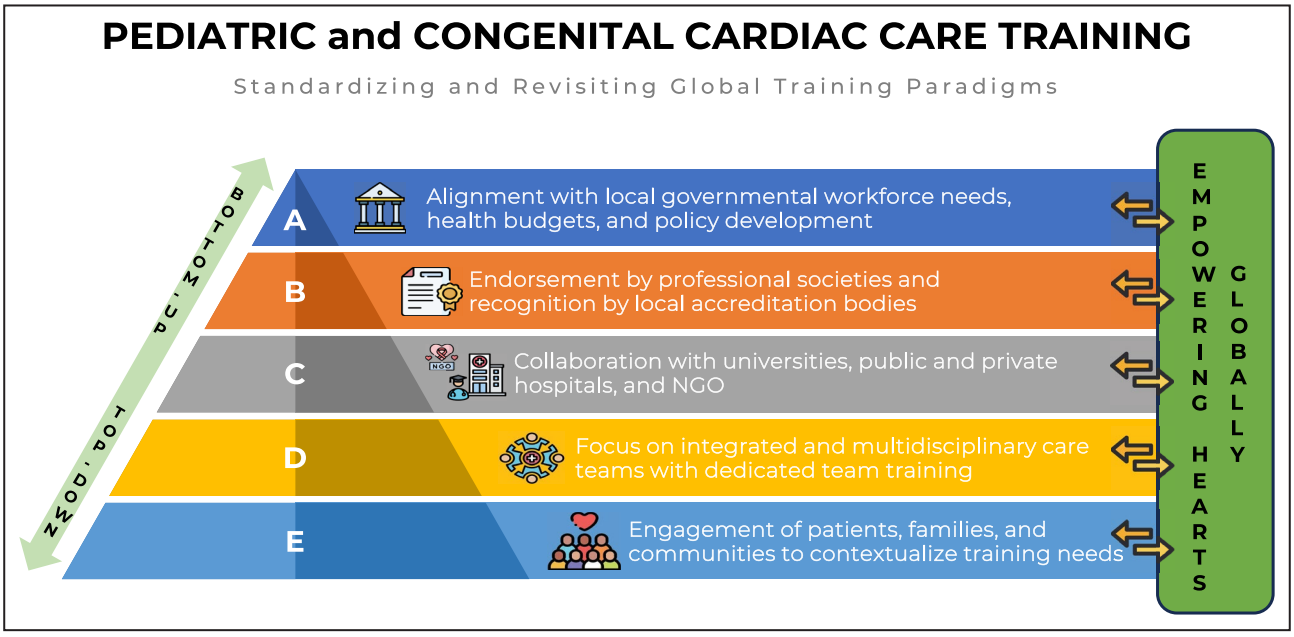

Figure 2. A standardized global approach to pediatric cardiology training with an emphasis on engagement and empowerment.
NGO indicates nongovernmental organization.

time required for health care training. A crucial aspect of global educational initiatives is identifying and engaging thought leaders and experts from LMIC. This approach facilitates acceptance, lowers costs, and enhances sustainability.

Characteristics of a Scalable Global Training Program

A resource-efficient global pediatric and congenital cardiology health care training program should be designed for scalability. We propose the following characteristics for such a program:

- Developed with local experts and global partners
- A standardized curriculum with a modular design to allow for the option of self-paced, or asynchronous, learning
- Flexible scheduling, with full-time and part-time choices to improve accessibility
- Contextualized, interactive case-based lessons
- Empowering local health care providers and personnel, in partnership with local hospitals and community organizations, to participate in training
- Use of distance learning technologies and incorporation of emerging technologies to allow for the sharing of trainers and mentors
- Task-shifting and "train-the-trainer" approaches to address the health care provider and personnel shortage
- Standardized assessment tools for timely feedback and documentation of competency and educational attainment
- Approved pathways for credentialing and international recognition

Promoting graduate medical and nursing education is the first step in a global pediatric and congenital heart training strategy that aims for comprehensive and sustainable cardiac care programs integrated with regional and national health care systems in LMIC.[46] The proposed frugal training model will provide a standardized curriculum for graduate medical education, improve accessibility, address personnel shortages in LMIC, and include a credentialing process for recognizing educational attainment.

Global Curriculum Development

A comprehensive global training curriculum for pediatric and congenital cardiac care must be developed, covering CHD, pediatric acquired heart disease, preventive heart care, and home care needs. A detailed description is beyond the scope of this article but will be addressed elsewhere. A functional graduate education program in this field of medicine requires specialized training in pediatric cardiology, congenital heart surgery, pediatric cardiac anesthesia (and perfusion), pediatric cardiac intensive care, pediatric cardiac nursing, and health care administration. Respected thought leaders with expertise in medical and health care personnel education should assemble local experts and global partners to define training needs and expectations, develop procedures for regional curriculum development, plan funding and implementation, and establish criteria for trainee certification and training institution accreditation.

A standardized curriculum with a modular design will enable self-paced learning. Trainees can have the option of working part time while receiving additional medical training. Similar "executive degree" programs exist in business and law schools, and comparable structures exist for graduate medical education, albeit with varying levels of support.[30] A standardized curriculum could expand existing programs and expedite the creation of new ones. However, the curriculum must be customizable to meet the needs of local programs.

Flexible scheduling, including part-time options, broadens student participation, though it may extend training duration. Recorded didactic presentations and regular sessions dedicated to contextualized, interactive case-based discussions can create a hybrid approach that promotes education on relevant patient scenarios using local laboratory and imaging studies to address regional problems.

Personnel Shortage

A global educational approach, partnering with hospitals and community organizations to empower local health care providers and personnel, is essential to address all personnel shortages, especially nursing, due to high training costs and retention challenges. Local providers and graduate educated nurses will conduct hands-on training, a costly component of medical and health care personnel education. Distance learning technologies offer exceptional access to electronic education,[47] especially in remote areas.[48] Emerging technologies like simulation, virtual reality, and augmented or extended reality, enhanced by artificial intelligence, will soon enable the sharing of trainers and mentors. Artificial intelligence, through machine learning and generative language models, has the potential to transform medical education by providing more varied educational content, aiding in curriculum development, and tracking student progress.[49] Experienced health care educators will be able to simultaneously train and mentor students in multiple locations, sharing expertise and facilitating real-time, "hands-on" teaching without travel. Although still developing, artificial intelligence in training should reduce costs and improve quality in LMIC and other resource-challenged settings.[50]

A task-shifting or team-building approach, training nurses and allied health care personnel, can help alleviate personnel shortages. International collaborations can promote task-sharing with nurses and community health workers, particularly in cardiac diagnosis.[51,52] This may enable the training of independent sonographers for CHD screening and diagnosis without direct physician supervision.[53] Similar programs for community health workers can focus on rheumatic heart disease recognition and CHD screening. A hybrid model combining online modules with in-person teaching has shown promise in teaching basic echocardiography and electrocardiography in Malawi.[54] The Parent Education Discharge Instruction program shifted home care education to an independent nursing practice, reduced complications, and allowed medical providers to focus on higher function tasks.[55–57] Finally, there is a model of community health workers trained in postoperative CHD home care. The community health care workers support families with parent education, providing at-home care sessions to reduce postoperative complications (unpublished data, Children's HeartLink).

A train-the-trainer strategy is likely the most sustainable way to increase pediatric and congenital cardiac care providers and personnel in LMIC. Common in high-income and select upper-middle-income countries, this approach has proven effective in implementing regional newborn screening for CHD in Abu Dhabi and building pediatric critical care expertise in Georgia.[58,59] Organizations like Children's HeartLink have adopted this philosophy to develop centers of excellence as training centers in various LMIC.[60]

A long-term commitment to support local and regional trainers is crucial for attracting and retaining providers and personnel in these centers. Although brain drain remains a concern, this may be mitigated by addressing the root causes thereof. For example, the College of Surgeons of Eastern, Central, and Southern Africa has established a regional training program for surgeons in its 14 countries, among which 6 provide cardiac surgical training. Through formal standardized training, continued medical education, research opportunities, and the specialty-specific social network, high retention rates have been observed over the past few decades. Among cardiothoracic surgeons trained by the College of Surgeons of Eastern, Central, and Southern Africa, 88% of surgeons remained within their country and 96% remained within Africa.[61]

To counter the lure of better pay and conditions abroad, addressing salary and working conditions for specialists in pediatric and congenital cardiac care is essential. Additionally, lifelong training for all providers and personnel and research mentoring are vital for developing and sustaining pediatric centers in LMIC.[23,62] A combined academic and clinical model allows these centers to foster excellence through best practices, quality improvement processes,[63] and professional development through regular contact with international partners.

Assessment and Accreditation

Globally, formal training modules should be standardized to meet the needs of diverse communities while remaining adaptable to local requirements. There is a gap between knowledge transfer and documenting competency and mastery of clinical skills.[64,65] Regional and local flexibility in training is best paired with standardized assessment tools for competency, credentialing, and voluntary recognition of educational achievement for physicians, nurses, and other allied health care personnel.

For medical accreditation, standards for training organizations (eg, regional teaching hospitals) are needed for each cardiac care specialty, along with assessment tools for individuals in training. Uniform examinations could be part of the credentialing process, offered at the end of training to document that graduates meet an international standard. Efforts should also assess the clinical impact and outcomes of educational programs in different regions, taking a quality improvement approach toward initial and lifelong education. Several LMIC programs already have this approach, with exit written and oral examinations and logbooks detailing competencies. Importantly, accreditation should be accepted across programs for reciprocal training, as seen in the South Africa-based African Paediatric Fellowship Program and College of Surgeons of Eastern, Central and Southern Africa training.[51,66] Coordination and collaboration among existing NGOs should facilitate these activities.

Nursing and other allied health care personnel require specialized on-the-job education and training to obtain the requisite knowledge and skills required to competently care for children and young adults with congenital or acquired heart disease. Content in those important areas is not standardly taught during basic or undergraduate training for nurses. In addition, there should be a system in place for competency-based nursing practice and subsequent appropriate competency-based patient care assignments to optimize child outcomes. Specifics of required training are beyond the scope of this article. There is considerable need in LMIC for graduate-level trained nurse educators, nurse mentors, or clinical nurse specialists to foster requisite on-the-job education and training for all nursing personnel. Furthermore, consideration for the use of advanced practice pediatric nurse practitioners trained to manage children with heart disease in both outpatient and inpatient settings may aid in local nurse retention, foster continuity of patient care, and add capacity to a taxed medical workforce in many

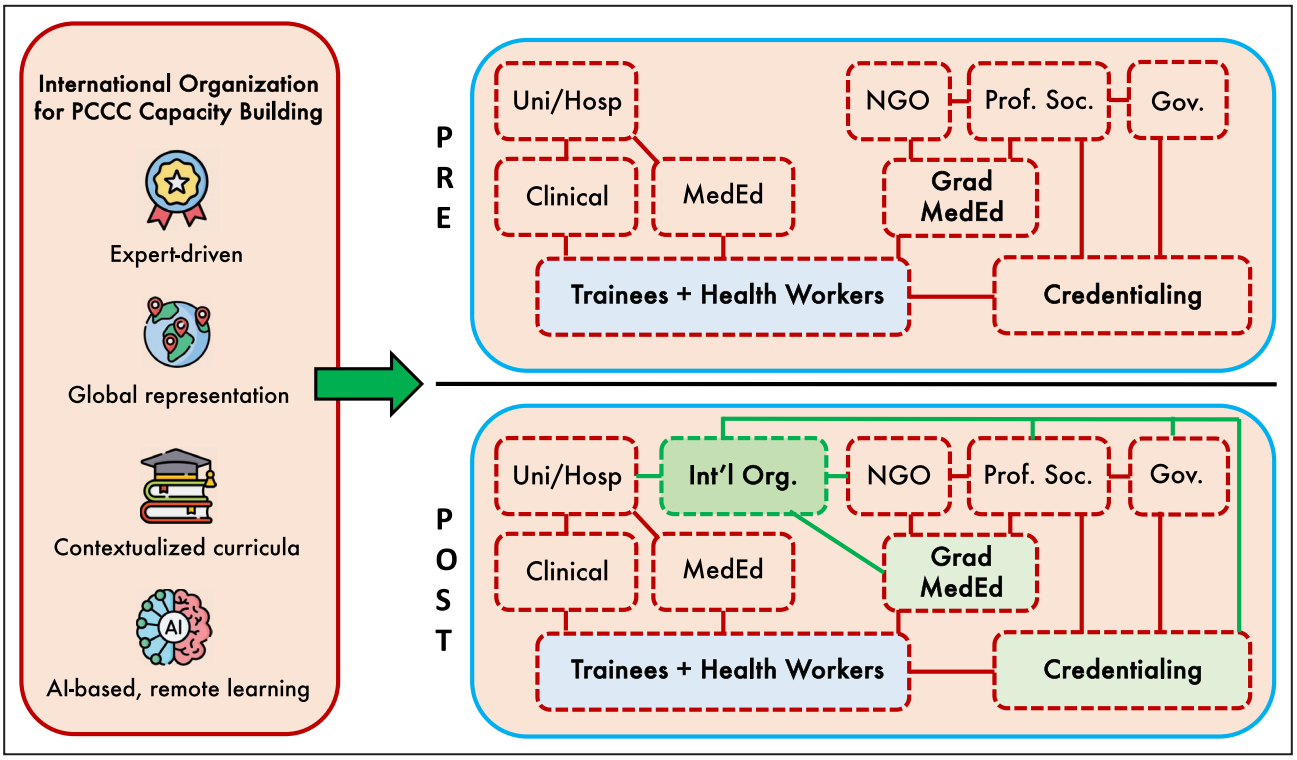

Figure 3. Role of an international organization in improving graduate medical education and credentialing.
AI indicates artificial intelligence; Gov. governmental agency; Grad., graduate; Hosp, hospital; Int'l, international; MedEd, medical education; NGO, nongovernmental organization; Org., organization; PC, pediatric cardiology; PCCC, Pediatric and Congenital Cardiac Services; Prof., professional; Soc., society; and Uni, university.

regions of the world. Accreditation for all graduate trained nurse roles will obviously vary by region or country. Also, specialized education and training for physiotherapists and occupational therapists will need to be considered for a well-functioning interprofessional team to optimize patient outcomes.

> *Tell me and I will forget, show me and I may remember; involve me and I will understand.* *Confucius*

> *Education is the most powerful weapon we can use to change the world.* *Nelson Mandela, 2003*

ANSWERING THE CALL

The long-standing history of international assistance and volunteerism in pediatric and congenital cardiac services[23,24] calls for a unified plan for global access to care in this field. A new international working group or organization can support and accelerate the efforts of current universities, hospitals, NGOs, professional medical societies, and local and national governments by broadening access to training—for physicians, nurses, and other health care personnel—and professional credentialing (Figure 3). This plan should encompass an innovative, scalable medical education and training program that emphasizes resource efficiency, leverages emerging technologies, prioritizes accessibility for trainees, and incorporates a rigorous assessment process to document educational attainment. Ultimately, the ideas generated from this effort should benefit graduate medical educational programs in high-income countries as well as in LMIC.

Although the roadmap for affecting change presented here may not be unique, the combination of a maturing workforce of skilled clinicians and educators plus the emergence of artificial intelligence provides a rare opportunity for amplification of efforts. To effectively reduce global inequity in access to pediatric and congenital cardiac care, a newly formed international organization must practice good governance principles, prioritize local solutions, and collaborate with other organizations to develop and execute a sustainable global strategy.

Principles of Good Governance

A program addressing global educational needs must adhere to fundamental principles of good governance: a clear vision and mission, transparency and fairness,

consensus-oriented decision-making, leadership accountability, and a culture of assessment and learning from failure. Operating globally, it must also build long-term relationships, demonstrate cultural sensitivity, adopt a lifelong learning approach, and manage costs and risks effectively.[67,68] Both trainers and trainees require mentorship and support, such as just-in-time training and consultations, from established programs.

Prioritizing Local Solutions

Developing a new frugal education model for global pediatric and congenital cardiac services necessitates partnerships with regional institutions and governments. Involving these agencies, along with other stakeholders like professional societies and NGOs, allows for the development and adaptation of training programs tailored to the needs and resources of local learners.[40,69] Combining local trainers with emerging technology can enable learner-directed and multilingual education.[70,71] Sustainability and acceptance depend on the involvement of all stakeholders.

Clinical training will often involve centers with overlapping missions of clinical care, education, and research. Local leaders, supported by governmental agencies and NGOs, will play a crucial role in selecting and supporting institutions that could become regional centers of excellence. In LMIC, these centers should also actively work to reduce health disparities.[72] Individuals from these organizations will lead in navigating local regulations for clinical care and participate in health care training (eg, for patient contact and hands-on procedures), health care financing, and educational certification. Creating and implementing an innovative educational model requires discussion and consensus, with the understanding that refinements will be necessary over time.

Need for a Global Strategy

Despite the significant contributions of talented individuals to the care of children with CHD worldwide, the health equity gap in pediatric and congenital cardiac care in LMIC persists due to a fragmented approach.[25] Adopting a "One Plan, One Budget" approach[41] will require all stakeholders to develop and agree upon a global strategy for training in resource-challenged environments. This unified approach entails complex negotiations between various governmental, nongovernmental, local, and global agencies involved in this field. A new international working group or organization could serve as a platform for these stakeholders to convene, either in person or virtually, to create viable programs that effectively use the provided education and training.

A global medical educational program for pediatric and congenital cardiac care will necessitate a high level of cooperation, significant startup financing, and a sustainable funding model. It will be best to start the program on a smaller scale, with the final training model requiring multiple iterations and local modifications. Collaboration is key to this global initiative. By working together, stakeholders can achieve far more than they could alone. As Sir Magdi Yacoub, a renowned heart surgeon and global health leader, aptly put it, "the envisioned results fully justify the effort."[23] His words serve as a powerful reminder of the immense potential of this global initiative.

CONCLUSIONS

In conclusion, although existing models of assistance and cooperation have made strides in enhancing global access to pediatric and congenital cardiac services, a significant health equity gap persists. By leveraging emerging technologies to accelerate a shift in focus toward capacity building, a rare opportunity exists to adopt an innovative, scalable global approach to graduate medical education and training. This approach will emphasize resource efficiency, prioritize accessibility for trainees, and incorporate a rigorous assessment process.

We propose the establishment of a dedicated, globally representative, international organization to spearhead the development and implementation of a comprehensive global strategy for training and credentialing health care professionals in pediatric and congenital cardiac care. The design and execution of such an innovative educational model must be a collaborative effort, incorporating input from all stakeholders. It is crucial to recognize that programs should be adaptable to local needs and that ongoing refinement will be essential for sustained success.

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