

Pediatric and Congenital Cardiac Care in Low- and Middle-Income Countries

Frugal, Adaptable, and Scalable
Training and Technology



Empowering
Hearts Globally

Congenital Heart Disease

A Global Health Equity Gap



- CHD affects 1.8% of live births
- > 260,000 annual deaths globally
- Survival
 - > 90% if born in a HIC
 - << 50% if born in a LIC**

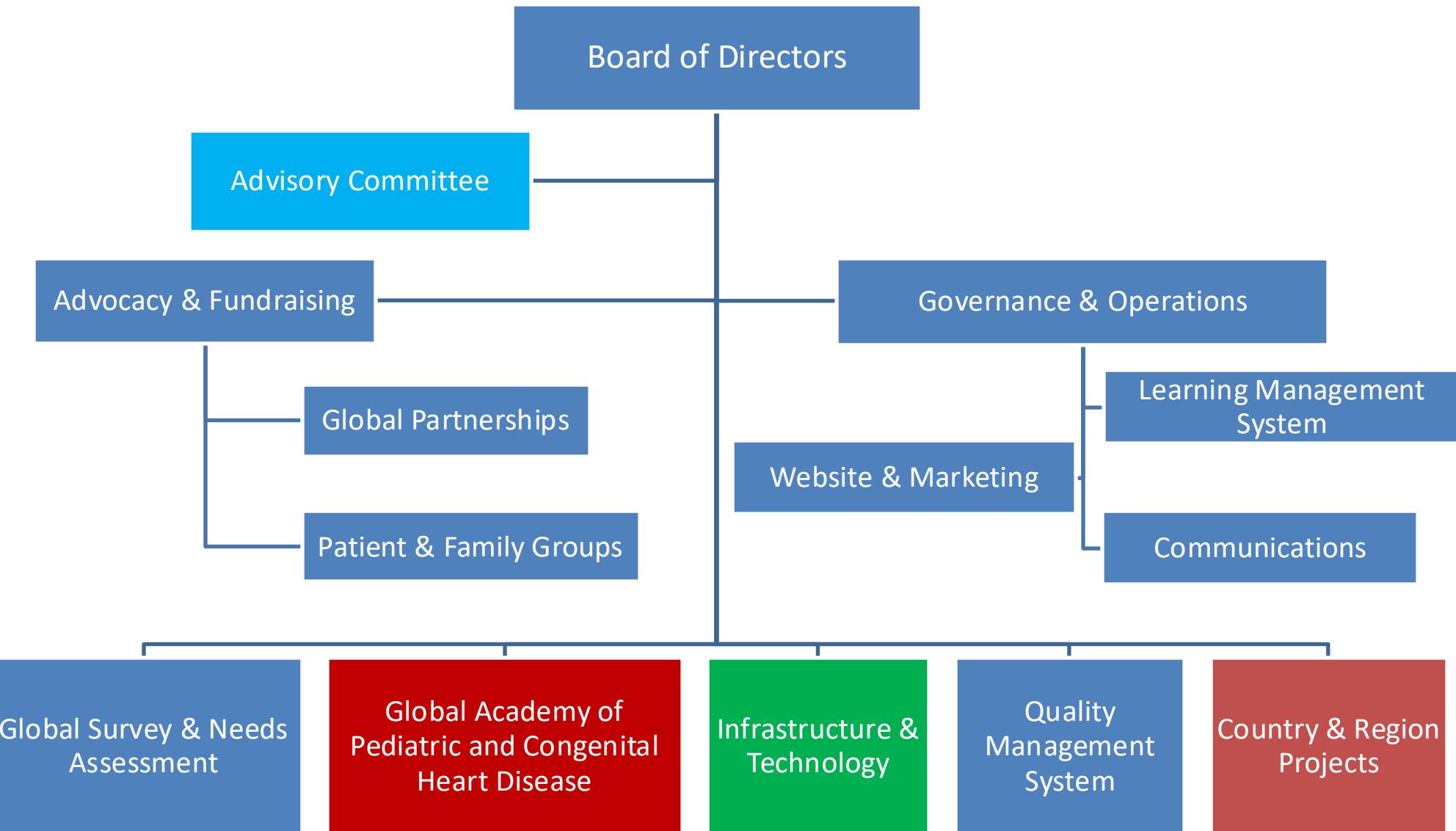
- Major limitations to current models of assistance
 - High cost, few children treated
 - Few sustainable programs
- 90% of children in LIC still lack access to cardiac surgery
- **Major barriers to care include workforce shortage and delayed diagnosis**

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The Problem: Too many children with congenital heart disease are dying due to lack of access to care

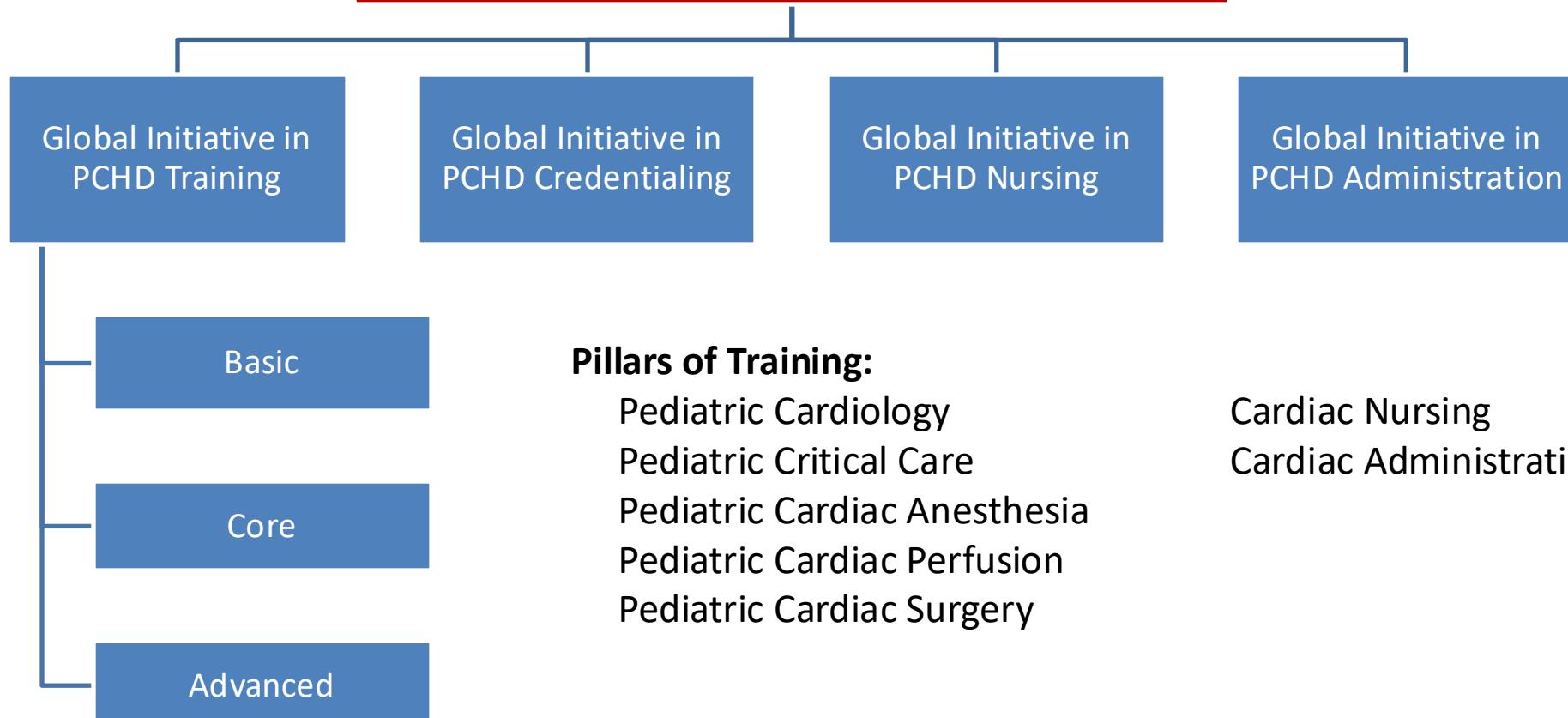
The Mission: Transform access to quality pediatric and congenital cardiac care in low- and middle-income countries

Our Goal: To develop an innovative approach to graduate medical training and early diagnosis by using emerging technologies



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Global Academy of Pediatric and Congenital Heart Disease (GAPCHD)



Infrastructure & Technology

Training

Specialty-Specific LLM

Augmented Reality

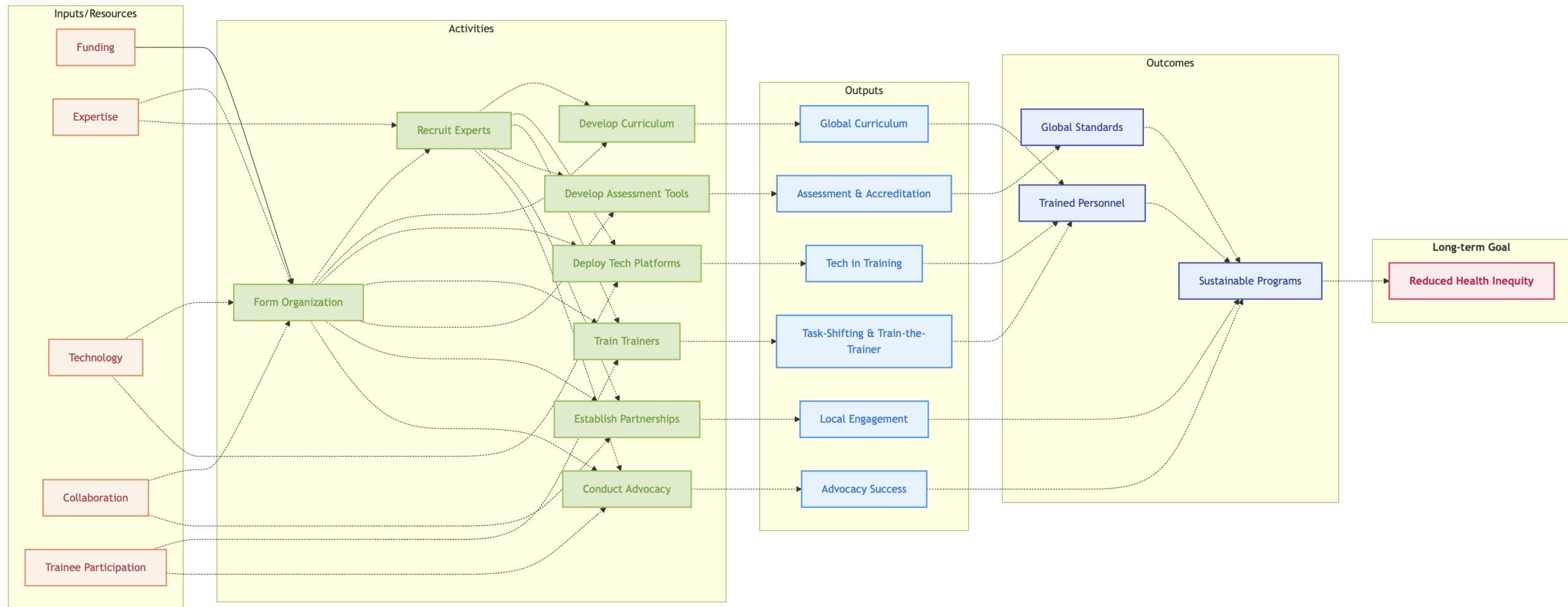
AI-Enhanced
Simulation

Early Detection

Deep Learning Model
for Prenatal Detection
of CHD

AI-Guided POCUS
Tool

Theory of Change Flow Chart



Advisory Committee - Page 1



Wyman W. Lai



Dominique Vervoort



Ericka Perez Albrecht



Paul Barach



Carolina de Campos



Kevin Glover



Babar Hasan



Ruth Heying



Jeffrey P. Jacobs



Kathy Jenkins



R. Krishna Kumar

Advisory Committee - Page 2



Sandra Mattos



Colin McMahon



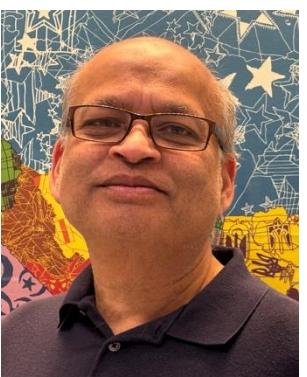
Nelva Pelaez



Kenneth Remy



Fenny Shidhika



Bhuwan Srivastava



Shubhika Srivastava



Sandra Staveski



Bistra Zheleva



Liesl Zuhlke



Anthony Chang



*Falafel
Theory*

Save the Heartbeat 

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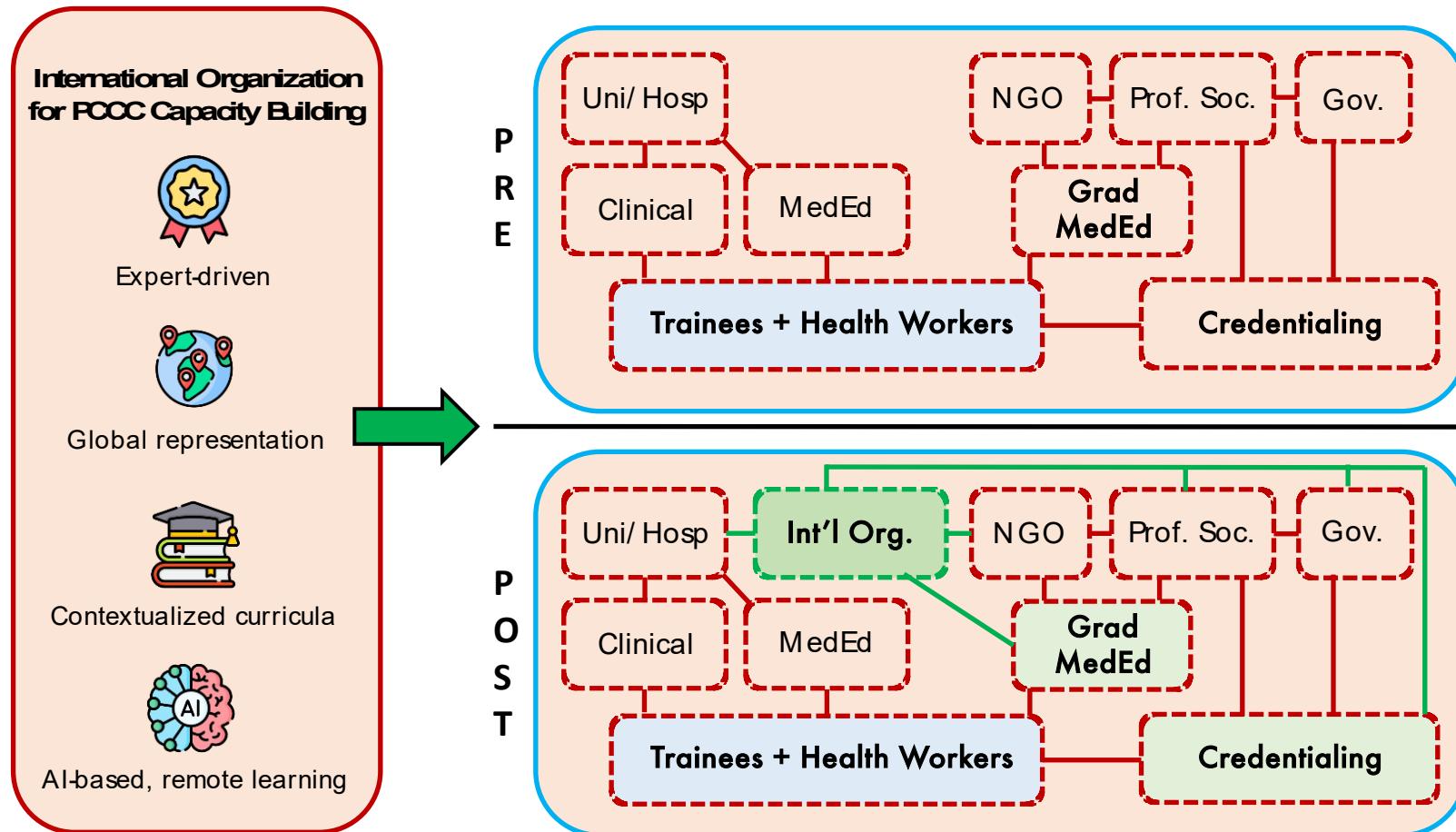
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Empowering Hearts Globally

Role of an International Organization in Improving Graduate Medical Education and Credentialing





CONTEMPORARY REVIEW

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

Wyman W. Lai , MD, MPH, MBA; Dominique Vervoort, MD, MPH, MBA; David Bradley , MD;
Antonio G. Cabrera, MD; Casey Culbertson , MD; Alejandro Floh, MD, MSc; Saurabh K. Gupta , MD, DM;
Babar S. Hasan , MD; Adrian Holloway, MD; Jeffrey P. Jacobs , MD; Kathy J. Jenkins , MD, MPH;
R. K. Kumar , MBBS, MD, DM; L. A. Larrazabal, MD; Colin J. McMahon , MD, MHPE, MBA, DCH;
Daniel J. Penny, MD, PhD, MHA; Alistair Phillips, MD; Emilio Quezada , MD; Craig A. Sable , MD;
Shubhika Srivastava, MD; Sandra L. Staveski, PhD, RN, CPNP-AC; Patcharapong Suntharos, MD;
David F. Teitel , MD; Betsy Tirado, RN; Brian C. Tran; Bistra Zheleva , MBA;
Liesl Zuhkle, MBChB, DCH, MPH, MSc, PhD; Anthony C. Chang, MD, MBA, MPH, MS



Characteristics of a Scalable Global Training Program

Executing a global strategy for training while prioritizing local solutions

- Standardized curriculum with a modular design
- Contextualized, interactive case-based lessons
- Training-the-trainer approach
- Sharing of trainers and mentors
- Standardized assessment tools

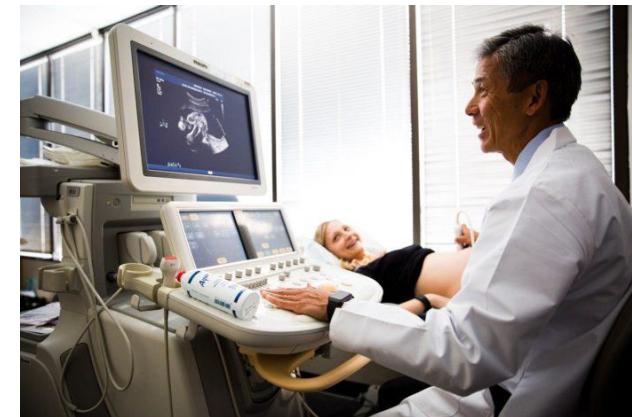
Emerging Technologies in Medical Education

- Pediatric cardiology large language model with RAG
- Augmented or extended reality for remote hands-on training
- AI-enhanced simulation training and assessment



Emerging Technologies in Early Diagnosis

- AI-enhanced fetal screening for congenital heart disease
- Point-of-Care Ultrasound (POCUS) for congenital and rheumatic heart disease



Strategic Goals

- Innovative Global Medical Education
- Innovative Technology for Early Diagnosis
- Capacity Building and Quality Improvement
- Knowledge Sharing and Networking
- Advocacy and Policy
- Funding and Fundraising
- Sustainable Programs

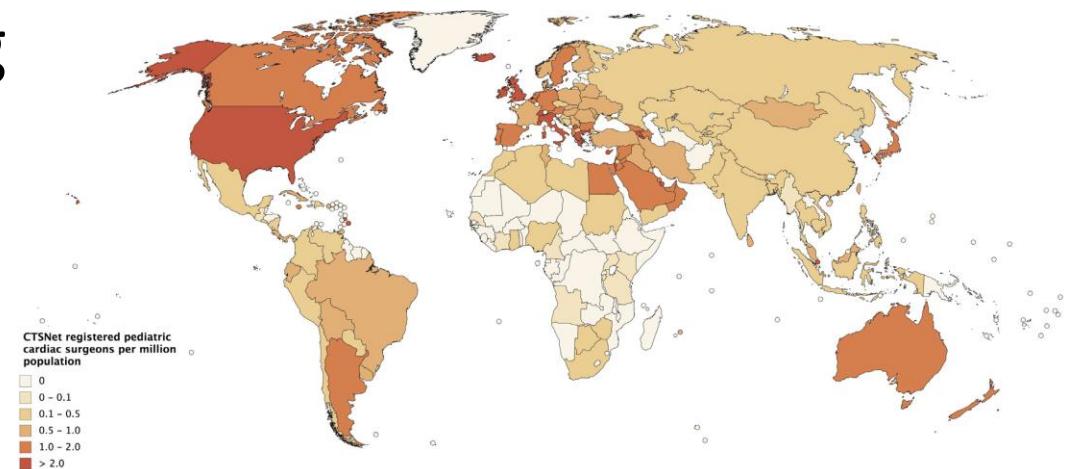
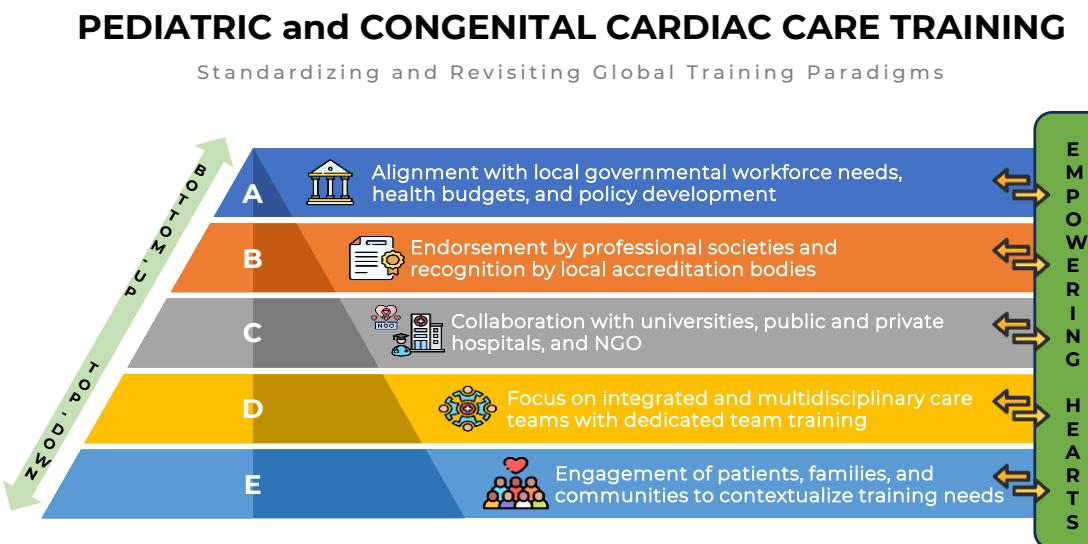


FIGURE 5. Pediatric cardiac surgeons per million population registered with the CTSNet in August 2017 (n = 3858). Map created at www.mapchart.net.
CTSNet, Cardiothoracic Surgery Network.

Start-Up Tasks

- Recruitment of Experts in Education and Technology
- Global Physician and Nurse Needs Assessment
- Curriculum Development
 - Pediatric Cardiology ***FIRST***
 - Team Approach
- Credentialing and Accreditation



Next Steps

- Partnership Agreements
- Refinement of Technology
- Funding and Fundraising
- Networking
- Pilot Programs



Impact

- Transformative Impact: *improve the lives of children with CHD*
- Sustainable Solutions: *prioritizing care in LMIC*
- Empowered Workforce
- Reduced Disparities: *bridge the global gap in access to quality pediatric and congenital cardiac services*
- Educational Reform: *quality with access*
- Pioneering Innovation

The Project Canvas: Developing An Innovative Approach to Global Training and Early Diagnosis in Pediatric and Congenital Cardiac Services

Foundation	People		Creation	
<p>Purpose <i>To transform access to quality pediatric and congenital cardiac care in low- and middle-income countries (LMIC)</i></p>	<p>Sponsorship <i>A new international organization of visionary clinician educators and collaborative healthcare advocates</i></p>	<p>Stakeholders <i>Governmental, non-governmental, local, and global agencies committed to the care of children and young adults with heart disease in LMIC</i></p>	<p>Deliverables <i>Training programs in pediatric and congenital heart disease (PCHD) tailored to the needs and resources in LMIC; development of pediatric cardiology large language model and early diagnostic tools for pediatric and congenital heart disease</i></p>	<p>Plan <i>Development of curricula and technologies in 2025-26; Testing of core curricula in pilot countries in 2026</i></p>
	<p>Resources <i>Educators, technology innovators, individuals familiar with challenges due to resource limitations, and individuals skilled in finance and advocacy</i></p>			<p>Change <i>Teaming with local partners to define appropriate short- and long-term goals; provide continuous learning opportunities and quality improvement tools</i></p>
<p>Investment <i>Start-up expenses of \$1.28 M over 1.5 years and estimated expenses of \$16 M over 10 years, decreasing years 7 to 10</i></p>		<p>Benefits <i>Improved access to personnel pediatric and congenital cardiac care and earlier diagnosis of PCHD leading to better outcomes</i></p>		

Wildly Important Goals

- Top Clinical Priorities
 - To develop a pediatric cardiology core curriculum by December 7, 2025 (for presentation at the World Congress of Pediatric Cardiology & Cardiac Surgery 2025)
 - To offer an online pediatric cardiac nursing course, in partnership with other organizations, by February 1, 2026
- Top Technological Priority
 - To develop a pediatric cardiology large language model with retrieval-augmented generation (LLM with RAG) by June 30, 2026

“...the envisioned results fully justify the effort.”

- Sir Magdi Yacoub, *Circulation* 2007

Establishing Pediatric Cardiovascular Services in the
Developing World: A Wake-up Call