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Asia-Pacificâ??s Cardiac Revolution: From Global Evidence Gap to Global Innovation Powerhouse

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With Asia-Pacific accounting for just 7.7% of enrolment in major cardiometabolic trials, Prof Tan calls for stronger regional research leadership, AI-driven innovation and equitable access to advanced cardiovascular treatments.



Asia-Pacific stands at a defining moment in interventional cardiology, where technological advancement must be matched by stronger clinical evidence and wider patient access. I**n an exclusive interview with BioSpectrum Asia, Professor Tan Huay Cheem, Founding Member and Course Director of AICT-AsiaPCR 2026 and Senior Advisor and Senior Consultant, Department of Cardiology, National University Heart Centre, Singapore,** shares his perspectives on AI-assisted interventions, next-generation cardiovascular technologies, cross-border research collaboration and the region's potential to shape global cardiac care in 2027 and beyond.

Despite accounting for nearly 60% of the global population, Asia-Pacific remains significantly underrepresented in major cardiovascular clinical trials. What are the structural barriers preventing greater regional participation, and how can APAC move from being a consumer of global evidence to a contributor shaping international treatment guidelines?

Asia-Pacific (APAC) has the scale, patient population and disease burden to make a greater contribution to cardiovascular research, but several structural barriers continue to limit participation. These include fragmented regulatory frameworks, differences in research infrastructure and expertise, linguistic and geographic diversity, limited access to research in non-urban settings, and uneven availability of technologies and biobanking facilities. Patient awareness and willingness to participate in research can also vary considerably across countries [1].

The evidence gap remains substantial. A review of 656 major cardiometabolic trials found that only 7.7% of enrolment occurred in APAC, while APAC-led authorship accounted for just 7.9% of trials. Importantly, greater APAC authorship and collaboration were strongly associated with higher regional recruitment, suggesting that strengthening regional leadership can directly improve representation [1,2].

Moving forward will require more multinational investigator-led trials, stronger regional research networks, investment in clinical-trial infrastructure and workforce development, and greater alignment of regulatory and ethical processes. Initiatives by various organisations such as the Asian Pacific Society of Interventional Cardiology (APSIC) and the Asia Pacific Cardiovascular Research (ASPIRE) Network are in place to connect existing national research infrastructures and develop coordinated multicentre studies across the region [1].

Alongside this, regional educational platforms such as AICT-AsiaPCR, the official Course of APSIC, can help strengthen the wider ecosystem by bringing practitioners from across APAC together to exchange clinical experience, discuss emerging evidence and techniques, and build professional networks across countries. Its regional, case-based and practical format also creates opportunities for younger interventionists to learn from experienced faculty and for locally relevant clinical perspectives to be shared more widely [3].

The goal should not be to create a separate evidence base for APAC, but to ensure that the region contributes more meaningfully to global evidence and clinical practice. Stronger research networks and regional educational platforms can play complementary roles. The former by expanding evidence generation, and the latter by helping clinicians interpret, exchange and apply that evidence across diverse real-world settings.

Interventional cardiology is advancing rapidly through complex PCI, intracoronary imaging, coronary physiology and structural heart interventions. Which emerging technologies do you believe will fundamentally transform cardiovascular treatment across Asia-Pacific over the next five years, and where is the region positioned to lead innovation?

The next phase of interventional cardiology is likely to be shaped less by one breakthrough technology and more by the integration of better imaging, physiological assessment, device innovation and data-driven decision-making [4].

In coronary intervention, intravascular imaging and physiology are increasingly helping physicians understand lesion characteristics, determine whether intervention is necessary and optimise PCI [3]. At the same time, new technologies are expanding the options available for complex disease. One example is the treatment of heavily calcified coronary arteries, where calcium can prevent a stent from expanding adequately and make procedures more challenging. Newer calcium-modification technologies such as intravascular lithotripsy are designed to fracture this calcium before stent implantation [5].

An example of this evolving device landscape is LithiX Hertz Contact Intravascular Lithotripsy (HC-IVL), a balloon-based system that uses mechanical contact forces to fracture coronary calcium without an external energy generator. Published PINNACLE-I [5] and MY-IVL studies [6] have demonstrated its feasibility in moderately to severely calcified lesions, although both are single-arm studies. This is illustrative of a broader trend, that innovation is increasingly focused not simply on creating new devices, but on addressing specific procedural challenges and making complex PCI more predictable and practical. Structural heart intervention is another important area of growth, alongside advances in procedural imaging [7].

APAC is also well placed to contribute rather than simply adopt innovation. The region has already generated influential techniques in complex PCI, bifurcation intervention, chronic total occlusion treatment and transradial intervention [8,9].

The opportunity over the next five years is therefore to combine this technical expertise with stronger regional evidence, in the number of randomised controlled clinical trials that are being carried out, evaluating new technologies and treatment strategies, not only for whether they work, but which patients benefit, how they compare with existing approaches, and whether they can be implemented effectively across different healthcare settings in APAC.

Asia-Pacific presents significant disparities in cardiovascular infrastructure, reimbursement policies and access to advanced interventions. How can healthcare systems balance the adoption of cutting-edge technologies with affordability, clinical outcomes and equitable patient access?

APAC is highly heterogeneous. Regional consensus work in complex PCI has highlighted major differences in healthcare infrastructure, affordability, device availability and access to experienced operators. In some developing settings, even established technologies such as intravascular imaging or physiological assessment may remain difficult to access because of reimbursement and infrastructure limitations [9].

Similar issues have been seen with transcatheter aortic valve implantation (TAVI). Adoption in parts of Asia was initially slower because of device cost, limited reimbursement, lack of dedicated infrastructure, and shortages of specialised Heart Teams and training programmes [10]. Another area will be the use of IMPELLA microaxial pump for patients with cardiogenic shock complicating acute myocardial infarction [11].

A more sustainable approach would include appropriate patient selection, stronger local outcome and cost-effectiveness data, regional registries and structured training, while ensuring that adoption and funding decisions are guided by demonstrated clinical value. Highly specialised procedures may also need to be concentrated initially in centres with sufficient case volume and multidisciplinary expertise [12].

Equitable access does not necessarily mean making every technology immediately available at all centres. It means ensuring that patients can access interventions that are evidence-based, clinically appropriate and supported by systems capable of delivering them safely.

As artificial intelligence, robotics and advanced imaging increasingly enter cardiovascular care, how do you foresee these technologies influencing interventional decision-making, procedural precision and patient outcomes? What challenges must be addressed before widespread clinical adoption?

Artificial intelligence (AI) is likely to have its earliest practical impact by supporting clinicians rather than replacing clinical judgement.

In interventional cardiology, AI is being explored for automated angiographic analysis, lesion detection, vessel segmentation, prediction of physiological significance and interpretation of intravascular imaging. It may help physicians process complex imaging more quickly and consistently and support procedural planning and PCI optimisation [13,14].

However, the field is still developing. Recent systematic reviews have found that many AI models perform well in development datasets but lack sufficient external or prospective validation. Challenges include differences in data quality, potential algorithmic bias, limited generalisability across populations, integration into clinical workflows and the need for clear regulatory oversight [14,15].

For now, AI is better at descriptive rather than prescriptive function. In imaging, it can provide accurate image interpretation but lacks the clinical judgement and ability to devise strategies and predict success and complication rates.

Robotic PCI is another promising area. It may improve procedural precision and substantially reduce radiation exposure for operators, but evidence demonstrating superior patient outcomes compared with conventional PCI remains limited, while cost, procedural complexity and compatibility with advanced devices remain barriers to widespread adoption [16,17].

The priority should therefore be rigorous validation, clinically meaningful outcomes and appropriate governance. Technology should make procedures safer, more reproducible or more accessible. Adoption should not be driven by novelty alone.

With APAC increasingly developing its own clinical expertise and research capabilities, what opportunities exist for stronger collaboration between hospitals, medical technology companies, academic institutions and regulatory authorities to accelerate region-specific cardiovascular innovation and clinical evidence generation?

APAC has an opportunity to build a more connected cardiovascular research and innovation ecosystem rather than having institutions and countries work independently. Hospitals and academic centres can contribute clinical expertise, research leadership, and suggest patients while medical technology companies can support technology development and clinical investigation. Finally, regulators and research networks can help create clearer pathways for well-designed multicentre studies. The greatest value comes when these groups work together around questions that are clinically relevant to the region.

The ASPIRE Network is one example of this approach. It brings together cardiovascular researchers across multiple APAC markets and aims to leverage existing national research infrastructure, including Singapore's cardiovascular clinical-trials (Cardiovascular Disease National Collaborative Enterprise - CADENCE) and Clinical Research Malaysia, to support multicentre studies, investigator-led research, industry collaboration and development of future clinical researchers [18].

Equally important is what happens after evidence is generated. Regional educational platforms such as AICT-AsiaPCR, the official Course of APSIC, provide a forum where clinicians from different healthcare systems can examine emerging evidence, discuss real cases and techniques, and exchange experience across borders. The Course was deliberately developed as an APAC platform shaped by representatives from across the region, with an emphasis on practical learning and shared best practice.

As such, stronger collaboration across various stakeholders can help APAC build a more connected cardiovascular innovation ecosystem. The priority should be to strengthen the links between these groups so that innovation is not only developed in the region, but also evaluated rigorously, adapted to local healthcare settings and translated into better patient care.

Looking towards 2027 and beyond, what do you see as the most significant opportunities and challenges for interventional cardiology in Asia-Pacific? What must the region prioritise to establish itself as a global leader in cardiovascular research, innovation and clinical excellence?

APAC has the opportunity to play a greater role in shaping the future of interventional cardiology. The region already has recognised expertise in complex PCI, bifurcation intervention, chronic total occlusion treatment and transradial intervention, while structural heart procedures, advanced imaging, physiology-guided treatment and digital technologies continue to expand [8,9].

The main challenge is ensuring that evidence generation, access and clinical capability keep pace with technological advancement. APAC remains underrepresented in many international cardiovascular trials, while differences in infrastructure, reimbursement and specialist expertise continue across the region. Emerging technologies such as AI will also require robust validation in diverse Asian populations and clear evidence of clinical value [19].

Priorities should therefore include greater APAC leadership in multinational and investigator-led research, stronger regional registries and real-world evidence, continued investment in specialist training, and closer cross-border collaboration. Evaluating new technologies in the context of local healthcare systems will be equally important, so that innovation translates into meaningful clinical benefit.

APAC's opportunity is not simply to adopt global innovation, but to help generate the evidence, evaluate new technologies in regional settings, build the expertise to use them well and contribute that knowledge back to global practice.

If you are interested in attending AICT-AsiaPCR 2026, taking place from 23–24 October, you can explore the programme and register here: https://www.pcronline.com/Courses/AICT-AsiaPCR/Register

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