

The impact of ICCPR's Global Audit of Cardiac Rehabilitation: where are we now and where do we need to go?

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Despite the global epidemic of cardiovascular disease and the well-established mitigating benefits of cardiovascular rehabilitation (CR), availability is known to be grossly insufficient, and little was known about the nature of services delivered in resource-poor settings where it is needed most. Indeed, this had not been quantified before the International Council of Cardiovascular Prevention and Rehabilitation's (ICCPR) 2017 Global Audit, published in volume 13 of *eClinicalMedicine*.^{1,2} This commentary will: (1) summarize the key findings of the Global Audit, (2) actions taken to address identified issues, (3) what is known about current CR availability and the nature of delivered services globally, and finally (4) consider open questions and future directions to achieve change.

There were two main parts to the Audit. First, ICCPR's many members Associations (i.e., 43) and friends (<https://globalcardiacrehab.com/Members>) confirmed any program availability in every country globally (including number of programs in the country, where applicable). Second, they facilitated administration of an online survey to identified CR programs. This assessed program capacity and quality of services.

Correspondingly, two main papers from the Global Audit were published in *eClinicalMedicine* in August 2019 (Fig. 1). One characterized CR availability and density.¹ Results showed CR is available in only 111/203 (54.7%) countries globally; many countries with high burden have no (e.g., in Africa) or minimal CR (e.g., India, China, Russia). It is estimated there were 5753 CR programs that could serve 1,655,083 patients/year, despite an estimated 20,279,651 incident ischemic heart

disease (IHD) cases globally/year. The absolute density was one CR spot per 12 IHD cases globally (per 66 in low and middle-income countries versus 3.5 in high-income ones).

Results were leveraged by ICCPR to advocate to increase CR capacity (Fig. 1). CR density in each country was shared with national champions for broad dissemination, with drafted messages on how it compared to other countries, and what could be done. The manuscript also characterized top barriers to CR delivery, and ICCPR worked to address them. For instance, their CR advocacy toolkit (<https://globalcardiacrehab.com/Advocacy>) was leveraged to tackle the dearth of financial reimbursement. Lack of human resources was addressed by the launch of ICCPR's Cardiac Rehabilitation Foundations Certification.³ ICCPR along with many CR professionals across the globe have been working closely with the World Health Organization on their Package of Interventions for Rehabilitation,⁴ which promotes CR implementation for IHD in all member states.

The second main paper² characterized CR quality in relation to ICCPR's 2016 guidelines.⁵ Results revealed available programs were quite uniformly accepting patients with CR-indicated conditions,⁶ were staffed by multidisciplinary teams, and offered most of the core CR components.² This was the first study to establish that CR quality standards are being applied globally, and that while programs in low-resource settings did offer quality services, resource limitations and private-funding models did impact delivery (e.g., dose, comprehensiveness, multi-disciplinarity).

Based on these results,² ICCPR developed resources to support development of quality programs, particularly in resource-poor settings (Fig. 1). Their International Cardiac Rehabilitation Registry was launched in late 2021,⁷ with many successes achieved in its' first year.⁸ The ICRR has embedded dashboards whereby programs can evaluate change in their performance on 12



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Fig. 1: Main publications from ICCPR's Global Audit and corresponding initiatives to address issues raised. CR, cardiac rehabilitation; ICCPR, International Council of Cardiovascular Prevention and Rehabilitation; COVID, coronavirus disease. Note: other suggestion for capacity augmentation electronic cardiac rehabilitation (eCR; e.g., leveraging websites, videoconferencing, mobile phones, wearable devices, etc.).

indicators over time in relation to clinically-significant benchmarks, and compare it to all other ICRR-contributing CR sites (aggregate, non-site identifying data).⁷ ICRR's user sub-committee also supports a learning community, where based on ICRR data, programs focus on a specific area for quality improvement.

Follow-up research included addressing issues such as model delivery (e.g., home/technology-based, dose, women-focused programming) and CR costs/funding, as well as many region-specific publications delving into how CR availability and services differ and what we can learn from high-performing regions. For the first time, policy-makers, insurance companies and care providers were made aware of their CR status and could compare this regionally and internationally, inciting efforts to improve delivery and care.

The Audit was repeated in Spring 2020, shortly after COVID-19 was declared a pandemic⁸ (Fig. 1). Over 1000 (18.3% program response rate) responses were received from 70/111 (63.1% country response rate) countries in the world with existent CR programs. The update revealed some more CR programs had opened, primarily in countries where CR already existed.¹

Disconcertingly however, three-quarters of programs reported they had stopped CR delivery, which would correspond to ~4500 programs affected. Alternative models were delivered in many operational programs, primarily through low-tech modalities. However, remote CR was scantily reimbursed by government or insurance companies, raising questions of sustainability and patient access. These results were publicized to advocate for delivery and reimbursement of remote/virtual CR services, with positive effect in places such as Australia. Importantly then, when the COVID-19 pandemic has subsided, ICCPR shall repeat the Audit, to determine current CR delivery capacity (e.g., did programs re-open?) as well as models of care delivered and their reimbursement (i.e., are patients mostly receiving hybrid CR? Are they getting a sufficient CR dose to reduce risk at no out-of-pocket cost?).

It is daunting to consider how to address the tremendous gap in CR capacity, particularly given the mounting evidence of CR benefit for many other indications⁶ (which should also be considered in our future estimates). Clearly our capacity-increasing efforts must be undertaken in tandem with primary prevention efforts of

our partners, including promotion of healthy environments and behaviors. But at the least, the research should inform discussions about how to feasibly increase CR capacity using lower-cost, hybrid models while maintaining CR quality and consistency, particularly in low-resource settings where it is needed most.¹⁰

Contributors

All authors were involved in data collection for ICCPR’s Global Audit or the COVID-19 Audit update, with Drs. Grace, Turk-Adawi and Supervia as lead investigators. All authors submitted ideas to address the objectives herein to the senior author, who then drafted the commentary. All authors then had the opportunity to provide commentary or revision, ultimately agreeing to the final content. Dr. Ghisi generated the Figure. Prof. Grace and Dr. Turk-Adawi verified the underlying data.

Declaration of interests

The authors have no relationships/activities/interests to declare in relation to this commentary.

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