

Reports

The RECHARGE-IPCRG 'Teach the Teacher' programme: building capacity for pulmonary rehabilitation in low- and middle-income countries

Juliet McDonnell¹, Mark Orme², Linzy Houchen-Wolloff², Noel Baxter¹, Amanda Barnard³, Jaime Correia de Sousa⁴, Ioanna Tsiligianni⁵, Nikki Gardiner⁶, Azamat Akylbekov⁷, Gulzada Mirzalieva⁷, Maamed Mademilov⁷, Talant Sooronbaev⁷, Richard Kasiita⁸, Wincelous Katagira⁸, Bruce Kirenga⁸, Savithri Wimalasekera⁹, Thamara Amarasekara¹⁰, Mathanki Sooriyakanthan¹¹, Ravini Karunatilake¹², Rubia Ishrat¹³, Obaidullah Ahmed¹³, Humaira Hanif¹³, Prajjwal Dixit¹³, Deepak Talwar¹³, Shruti Sahasrabudhe¹⁴, Meenakshi Bhakare¹⁴, Sundeep Salvi¹⁴, Sally J Singh²

¹ IPCRG, ² Department of Respiratory Sciences, University of Leicester, Leicester, United Kingdom; Centre for Exercise and Rehabilitation Science, NIHR Leicester Biomedical Research Centre-Respiratory, University Hospitals of Leicester NHS Trust, Leicester, United Kingdom, ³ International Primary Care Respiratory Group (IPCRG), London, UK; Charles Sturt University and Australian National University, Canberra, Australia., ⁴ International Primary Care Respiratory Group (IPCRG), London, UK; Life and Health Sciences Research Institute (ICVS), School of Medicine, University of Minho, Braga Portugal. ICVS/3B's, PT Government Associate Laboratory, Braga/Guimarães, Portugal, ⁵ International Primary Care Respiratory Group (IPCRG), London, UK; Department of Social Medicine, University of Crete, Crete, Greece, ⁶ Centre for Exercise and Rehabilitation Science, NIHR Leicester Biomedical Research Centre-Respiratory, University Hospitals of Leicester NHS Trust, Leicester, United Kingdom, ⁷ Republican Research Center of Pulmonology and Rehabilitation, Ministry of Health, Bishkek, Kyrgyzstan; National Centre for Cardiology and Internal Medicine, Bishkek, Kyrgyzstan, ⁸ Makerere University Lung Institute, Kampala, Uganda, ⁹ Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka, ¹⁰ Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Nugegoda, Sri Lanka, ¹¹ Department of Physiology, Faculty of Medicine, University of Jaffna, Sri Lanka, ¹² Central Chest Clinic, Colombo, Sri Lanka, ¹³ Metro Centre for Respiratory Disease, Metro Hospital and Heart Institute, Uttar Pradesh, India, ¹⁴ Symbiosis Medical College for Women and Symbiosis University Hospitals and Research Centre, Symbiosis International (Deemed) University, Pune, India

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Introduction

Chronic respiratory diseases are the most common causes of morbidity and mortality globally. Pulmonary rehabilitation (PR) is a low-cost, high-impact intervention with patient education and exercise at its core. Although supported by a well-established evidence base, demand greatly exceeds capacity in low- and middle-income countries (LMIC), including limited workforce training opportunities to support PR development and implementation. The International Primary Care Respiratory Group's (IPCRG) Teach the Teacher (TtT) is an established education programme designed to build sustainable local clinical teaching and delivery capacity.

Methods

A collaboration between the National Institute for Health and Care Research (NIHR) funded Global RECHARGE Group for PR and IPCRG to deliver a 'Teach the Teacher' (TtT) programme for PR capacity building. Our Tier 1 TtT programme combined educational and PR service development concepts with core clinical content adapted for RECHARGE partners in India (Pune and Delhi), Sri Lanka, Kyrgyzstan and Uganda. Due to the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) pandemic, the programme was adapted to a digital environment using online platforms such as Zoom video conferencing and Google Classroom. We used an adapted framework to evaluate professional learning and its impact.

Findings

Fifteen Tier 1/local leader participants attended a sixteen-hour online programme in September–October 2021. Participants included nurses, physiotherapists, doctors and early career health professionals/researchers. As local leaders in PR, participants created a tiered teaching programme for developing a critical mass of PR expert teachers, contextualised to their local healthcare systems and cultures. Participants also explored how to engage and influence multiple professional groups and stakeholders to support the widespread sustainable implementation of PR.

Conclusions

The RECHARGE-IPCRG TtT programme provided a clear education and service development framework to support PR capacity development in LMIC. We address a lack of empirical evidence concerning capacity-building initiatives by being explicit about the programme's learning design, management and evaluation. A whole system perspective to PR allowed consideration of health systems, culture, referral pathways and scalability. Sustainable national PR education programmes will require additional resources and a long-term strategy, potentially aligning with the TtT three-tier cascade model.

The WHO Rehabilitation Call to Action 2030 highlights the importance of strengthening health systems to provide rehabilitation.¹ Chronic respiratory diseases (CRDs) represent a significant global burden, especially in LMIC,² where >90% of CRD-related deaths occur and where the demand for pulmonary rehabilitation (PR) greatly outweighs capacity.³ PR is supported by the highest levels of evidence⁴ and reduces the disability associated with lung disease. This multidisciplinary, complex intervention has supervised exercise training and education at its core, supporting people to manage their condition.⁵ In LMIC, PR has the potential to make a significant and sustainable contribution to the wellbeing of individuals as well as wider social, cultural and economic impacts.⁶ Although recommended internationally,⁴ the capacity to deliver PR in LMIC is underdeveloped.⁷

The National Institute for Health and Care Research (NIHR) Global RECHARGE Group (17/63/20)⁸ seeks to build capacity to address the unmet need for PR in LMIC. With five project partners in four countries - India (Pune and Delhi), Sri Lanka (Colombo), Kyrgyzstan (Bishkek) and Uganda (Kampala), the project proposes to reduce the disability associated with CRD through context-specific PR and building capacity for research,⁹ leadership and service development.^{10,11} With NIHR support LMIC partners are exploring how to implement and take account of the cultural, workforce, demographic and health differences.¹²

Accordingly, we describe an innovative education programme designed to build sustainable local capacity in PR teaching and delivery in LMIC. The Global RECHARGE Group, in collaboration with the International Primary Care Respiratory Group (IPCRG), developed a Teach the Teacher (TtT) programme. Our TtT programme is a scalable and sustainable model for workforce training, building local capacity to develop expertise in PR, service development, and teaching clinicians how to deliver PR.

METHODS

IPCRG is a clinically led charity, collaborating globally with primary care partners to achieve a vision of a world, feeling and breathing better through universal access to the 'right care'.¹³ The IPCRG education strategy proposes a TtT programme model to increase teaching capacity in primary care.¹⁴ It encompasses teaching and learning principles taught in parallel with evidence-based clinical content. Unlike conventional 'train the trainer' programmes based on a model of cascading knowledge,¹⁵ this approach empowers clinicians working in multiple health systems and in different languages, to think creatively about developing con-

text-specific programmes that strive to maintain fidelity to evidence-based practice. Previous TtT programmes have been piloted successfully in two European programmes on difficult-to-manage asthma^{16,17} and tobacco dependence, as well as a global programme on paediatric asthma¹⁸ and a Latin American programme on Asthma Right Care.

The RECHARGE-IPCRG TtT comprised a three-tier cascade programme (Figure 1) of education and was adapted for PR and, due to the severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) pandemic, it was further adapted to a digital-only environment.

We first convened a joint RECHARGE-IPCRG Master Faculty with combined expertise in PR (research and practice), teaching and learning for primary care, policy and behavioural interventions. We then conducted a situational analysis (S1 in online supplementary material) to inform the curriculum and learning design. This was completed by Principal Investigators (PIs) and team members from each of the five RECHARGE project partners. This helped the faculty to understand differences and challenges in respective healthcare systems, education and PR provision. We discussed the analysis with PIs to decide where to focus the programme to complement what was already offered as a core part of the research. We decided to focus on the education element of PR because there is greater potential variation in learning needs and adaptation for context than the exercise component and a lack of capacity to support spreading and sustaining PR. We recruited participants termed 'In-Country Master Teachers' (n=15) whom PIs selected based on a bespoke teacher specification (S2 in online supplementary material), including an assessment of English language capability, teaching/online teaching experiences, PR knowledge and PR delivery experience.

There were specific adaptations to the programme design, resulting from the need to transfer to an online learning environment due to the SARS-CoV-2 pandemic. We held a 'Tier Zero' meeting with a broader group of stakeholders to enhance online teaching and learning skills. A series of RECHARGE-IPCRG Faculty planning meetings enabled programme design and selection of optimal educational approaches. We consulted PIs about the feasibility and timings for online events. We used digital tools (such as Padlet: <https://en-gb.padlet.com>) for Faculty and Country Master Teachers to introduce themselves using text and photographs before the event.

We also held a technical pre-meeting (16.9.21) to build engagement with participants. The meeting lasted one hour and was hosted by some of the faculty. We met participants and introduced them to the online environment and

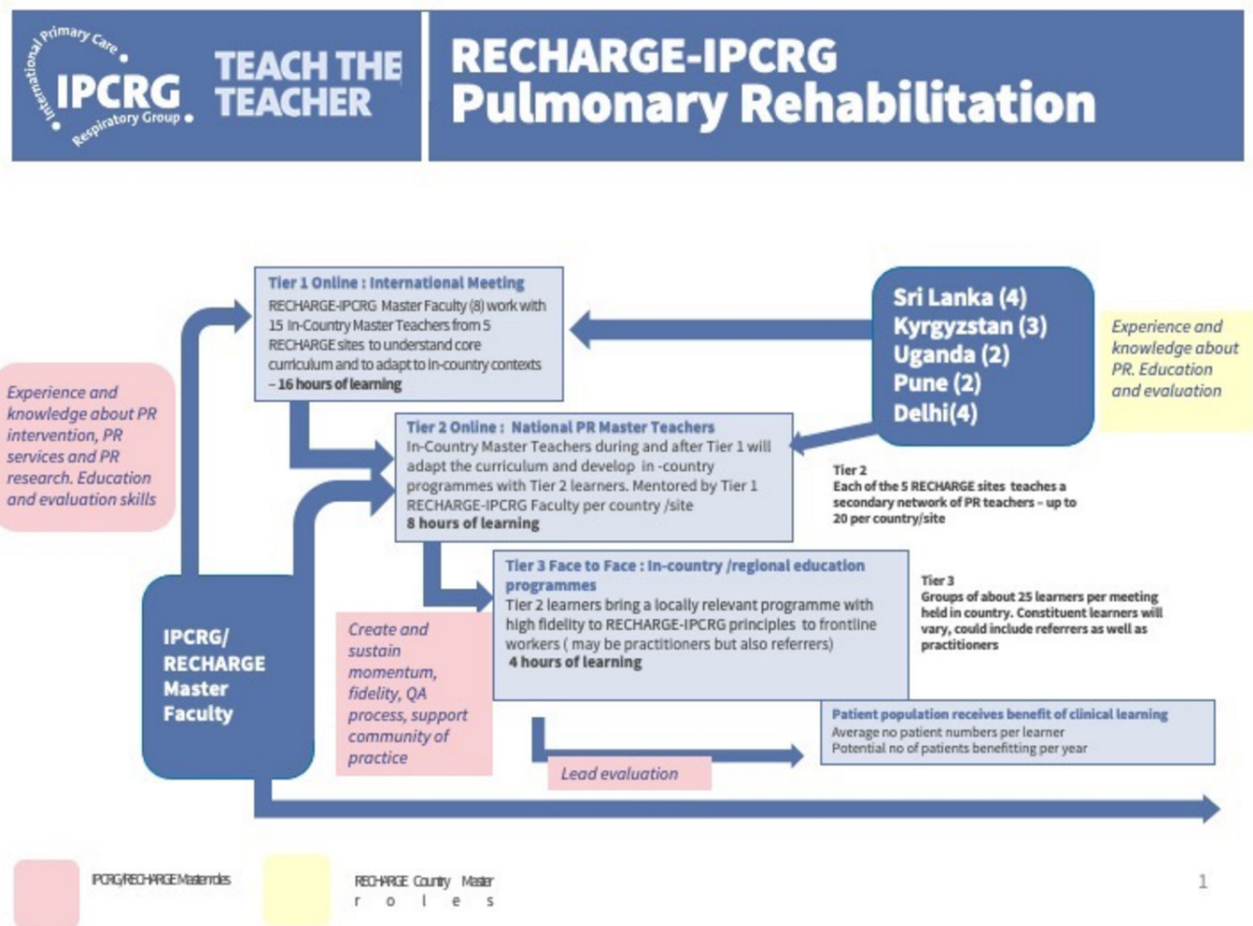


Figure 1. RECHARGE-IPCRG Teach the Teacher cascade programme for pulmonary rehabilitation

features of the online platform, such as the ‘chat function’, reactions/ emojis and room management.

The Tier 1 online international meeting took place over four sessions, each lasting four hours – sixteen hours of education (September-October 2021). All the sessions took place online. The curriculum consisted of teaching principles and techniques, the components of PR, and we supported participants in considering how to adapt the core PR curriculum to local settings (Table 1). For example, we included a session on which topics were culturally appropriate to include. While most participants would include topics such as how the lungs work, there were differences of opinion about including other topics such as how to have sex when breathless, death and dying and worrying about family finances.

Throughout the programme, there was a deliberate balance between teaching the important elements of PR (clinical content) and exploring how the Country Master Teachers would subsequently teach this to their clinical colleagues (process). This balance was achieved in many ways:

- We used various online teaching methods and tools, including Zoom features such as chat, Q&A and reactions; live polling; live surveys (e.g. <https://www.poll Everywhere.com/>); videos; formal slide presentations and small group work in breakout

rooms followed by whole group feedback and discussions.

- Google Classroom was used as a repository for learning materials, session transcripts, and recordings, made available to all participants.
- Transparent decision-making, whereby the RECHARGE-IPCRG faculty shared with participants about the process elements in running the course and demonstrated real-time dynamic adjustments to teaching content and delivery.
- Faculty Members were paired with each country group to offer support and mentoring. The Faculty also communicated behind the scenes, using WhatsApp and dropbox to share resources and adapt the programme in real time.

At the end of Tier 1 online international meeting, each country team presented proposals for PR education programmes and how they plan to transition their programme into tier 2 and tier 3 (Figure 1). This was delivered via PowerPoint presentation, with the faculty and other participants acting as a panel for discussion and constructive feedback. The teams contextualised the programmes to their local environments, including healthcare systems and cultures. They identified key stakeholders to ensure the scalability and sustainability of their programmes. We in-

Table 1. RECHARGE/IPCRG TtT Programme Objectives & Overview

Objectives: The curriculum was designed to enable local adaptation by the In-Country Master Teachers to be relevant to their local setting, including: <ol style="list-style-type: none"> To enable implementation of the British Thoracic Society's 'Fundamentals of PR' course in the participating countries. This included: <ul style="list-style-type: none"> Patient section and initial assessment Properties and conduct of field-based walking tests Patient education Fundamentals of exercise prescription – aerobic training To create a sustainable resource in each country of teachers who can disseminate this learning for the benefit of frontline staff and patients. <ul style="list-style-type: none"> How to teach others about PR as an intervention and a service 	
Curriculum for RECHARGE-IPCRG Tier 1 Programme	
Session 1 (4 hours) <ul style="list-style-type: none"> Welcome and opening of the session, aims and objectives Introduction of faculty and participants Country situational analysis, the context of PR, challenges and opportunities Participants' learning needs Principles of teaching and theory Content 1: PR patient selection and assessment Summary, close and pre-work for the next session 	Session 2 (4 hours) <ul style="list-style-type: none"> Small group work in country groups with Faculty facilitator: Selection and assessment: How will this work in your country? What adaptations, if any, would you need in your context? Start to record your plan for this element of the programme. Facilitated whole group discussion: How can the principles of the programme be spread, adopted, sustained and upscaled yet maintain fidelity to the original programme? Content 2: Properties and conduct of field-based walking tests. Constructing a local program – discussion of local suggestions and additions/adaptations.
Session 3 (4 hours) <ul style="list-style-type: none"> Teaching others – what have you seen, what modalities might work in your situation and context? (Facilitated large group discussion) Behaviour change models - whom do you need to change? Content 3: Patient education Small group work - PR programme in your own country Framework for change - how are you going to do it? Models of action/actor. Evaluation 	Session 4 (4 hours) <ul style="list-style-type: none"> Content 4: Fundamentals of exercise prescription - aerobic training Facilitated small group work on next steps/ own country programme Presentation of tiered teaching programmes. Faculty feedback Conclude: next steps, close of the programme.

corporated theory and practice of leadership and improvement skills during the course, which was also demonstrated in the final presentations.

FINDINGS

CASE REPORT

We used an adapted framework to evaluate professional learning and its impact (Figure 2).¹⁹ There are five levels of evaluation with different indicators, ranging from simple to complex.

LEVEL 1: PARTICIPANT REACTION

- Attendance: 15 participants from four countries, attended sixteen hours of online education. Participants included nurses, physiotherapists, doctors and early career health professionals/researchers.
- Participant reaction was evidenced by immediate and post-event experience survey and free-text feedback. Illustrative quotes:
 - “The interactions with the entire group from varied backgrounds and geographies were quite insightful. Theoretical knowledge on teaching was very helpful,” and “I learned a lot from how the course

was delivered and the interactive nature of the training”.

- All participants reported that their knowledge and confidence to teach online had increased and feeling more motivated and confident than before the course to run a Tier 2 education programme.

LEVEL 2: PARTICIPANT LEARNING

- A post-event knowledge survey (S3 in online supplementary material) consistently indicated improvements across all participants (n=15) in knowledge and confidence related to:
 - Identifying learning needs, learning theory, designing a learning event and engaging learners.
 - Patient selection and assessment, properties and conduct of field-based walking tests, fundamentals of exercise prescription, and aerobic training.
 - Knowledge and confidence in stakeholder mapping and behaviour change models.

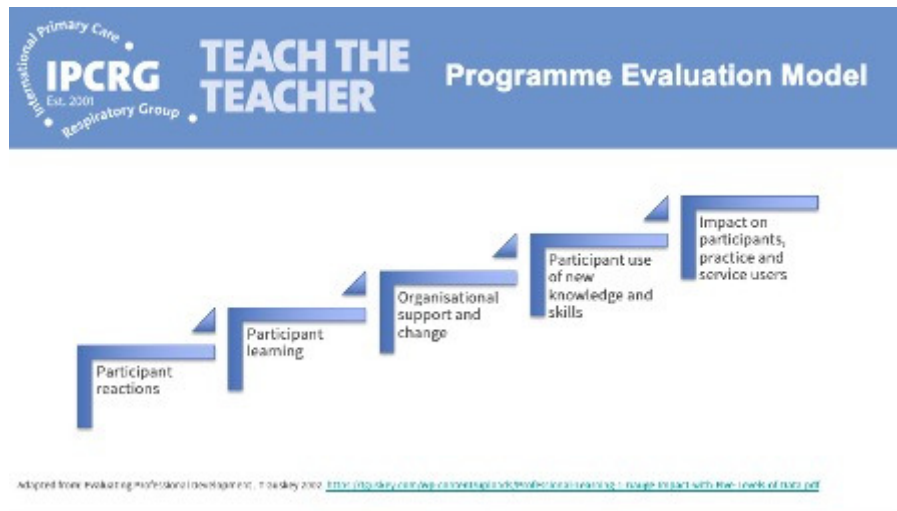


Figure 2. RECHARGE-IPCRG Teach the Teacher cascade programme for pulmonary rehabilitation - adapted model for programme evaluation.

LEVEL 3: ORGANISATIONAL DIMENSIONS (FACTORS WHICH ARE CRITICAL TO OR CAN HINDER/ PREVENT IMPACT)

- Participants presented proposals for PR education programmes, as well as how they plan to transition their programme into tier 2 and tier 3, which addressed specific features of local healthcare systems.
- For example, how to engage and influence across public/private healthcare sectors (India - Pune)

LEVEL 4: PARTICIPANTS USE OF NEW SKILLS AND KNOWLEDGE

- Participants developed feasible proposals for PR services and tier 2 & 3 education programmes adapted to their local context and demonstrated leadership to engage and influence multiple professional groups and stakeholders. Presentations were observed and recorded by RECHARGE-IPCRG Faculty, who provided feedback to participants.
- Proposals included cultural adaptations to support changes, such as nutritional support (Sri Lanka), incorporating the arts into PR, including dance (Kyrgyzstan) and singing (Sri Lanka), and other cultural adaptations like Yoga (India).

LEVEL 5: IMPACT ON PARTICIPANT PRACTICE AND ON SERVICE USERS

- Participants completed baseline qualitative work prior to TtT to examine the feasibility and acceptability of a national PR programmes.^{20–22}
- We continue to support participants to track implementation and to explore impact evaluation using narrative and standardised data collection.²³
- RECHARGE-IPCRG Faculty will provide ongoing mentoring.

- Five abstracts on implementation were presented to the IPCRG World Conference in May 2022.^{24–28}

DISCUSSION

‘Train the trainer’ or ‘cascade’ training has been widely proposed as a method for capacity building and strengthening health systems, by upskilling local experts and clinicians to offer peer-to-peer training and mentoring.¹⁵ It has been argued that a cascade approach oversimplifies a complex capacity-building process and often has a short-term horizon, raising questions over the effectiveness of training and longer-term sustainability - it has also been noted there is a lack of empirical evidence on the topic.¹⁵

Teach the Teacher (TtT) is an educational intervention which seeks to develop the capacity for teaching subject-specific knowledge and skills through a cascade approach, but offers an enhanced framework, which addresses the criticisms cited above. Through various iterations of the programme, we have enhanced and extended our understanding of capacity building in primary and respiratory care.^{16–18} This paper reports on our observations and experience of the IPCRGs TtT programme, which involved collaborating with the National Institute for Health and Care Research (NIHR) Global RECHARGE Group. It contributes to a larger body of work and practical knowledge concerning sustainable capacity-building models.

We proposed a three-tier cascade programme (Figure 1) of education adapted for PR. We successfully engaged an expert RECHARGE-IPCRG Faculty and five teams from four countries to develop in-country evidence-based education programmes for developing PR programmes. There were specific adaptations to the programme design, resulting from the need to transfer to a digital learning environment due to the SARS-CoV-2 pandemic. This was achieved through changes to learning design and supporting infrastructure for Faculty and participants. There was a deliberate balance between clinical content (teaching the impor-

tant elements of PR) and process (how the Country Master Teachers would subsequently teach to their clinical colleagues).

Our evaluation demonstrated that in-country teachers are highly motivated to develop in-country programmes building on previous participation and baseline work in the RECHARGE project. Each country now has a cohort of 'In Country Teachers' trained in PR and plans for an education programme adapted to their national context. Educational resources have been developed which can be used to sustain this work. There is increased confidence to offer PR to patients in clinical practice and to design and lead programmes of PR education. In-country teachers have the potential to develop PR services and, through repeated programmes, strengthen their teaching and expertise. In-country teachers were also highly motivated to influence policy and practice changes.

We have sought to address the lack of empirical evidence concerning capacity-building initiatives by being explicit about the faculty's work together on learning design and management of the programme and to elucidate a model of evaluation. This is practice-based knowledge,²⁹ which is sometimes neglected in traditional forms of academic literature - but is an important contribution for those tasked with designing and leading capacity-building projects.

At this stage, longer-term programme evaluation is inconclusive but suggests potential in developing PR services. It is unclear which factors or conditions contribute to success, as economic, political and social contexts are all significant variables.³⁰ There are commonalities in broad aims and challenges across partner countries, substantive differences in organisational, functional, professional, and service integration and population focus. These differences are useful in understanding the varied forms that implementation can take. Future research that tracks PR implementation at a service and/or population level is needed and will provide important lessons for service providers and policy-makers seeking to build capacity for PR.

CONCLUSIONS

The RECHARGE-IPCRG TtT programme provided a clear education and service development framework to support PR capacity development in LMIC. High-quality teaching programmes can support the implementation of PR in LMIC, where demand greatly exceeds capacity. The RECHARGE-IPCRG TtT programme combined educational, and PR service development concepts with core clinical content adapted for project partners and a digital environment. Local leaders in PR can develop context-specific tiered education programmes to develop a critical mass of expert teachers and PR practitioners. RECHARGE-IPCRG TtT can be successfully adapted to an online environment

using various teaching methods and digital tools, which can meet the needs of diverse international participants. A whole system perspective to PR allowed consideration of health systems, culture, referral pathways and scalability.

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AUTHORSHIP CONTRIBUTIONS

NB, MO, AB and SJS conceived and established the programme. JM, MO, LHW, NB, AB, JCS, IT, NG were the RECHARGE-IPCRG Faculty who designed and led the TtT programme and evaluation. TS, BK, SW and SS are PIs. AA, GM, MM, RK, WW, TA, MS, RK, RI, OA, HH, PD, DT, SS, MB are the in-country Teachers and participants of the TtT programme. JM conducted the analysis and wrote the first draft. All authors contributed to the final draft and checked for the content. All authors approved the manuscript as submitted.

COMPETING INTERESTS

The authors completed the Unified Competing Interest form at <http://www.icmje.org/disclosure-of-interest/> (available upon request from the corresponding author) and declare no conflicts of interest.

CORRESPONDING AUTHOR:

Dr Mark Orme PhD, Lecturer, Department of Respiratory Sciences, University of Leicester, University Road, Leicester, LE1 7RH, UK. mwo4@leicester.ac.uk

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