RESPIRE ASM 2024 Abstract Listing

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RESPIRE ASM 2024 Abstract Listing

Look for the numbers displayed on each poster board when visiting the posters shown below.

1 RESPIRE: A collaboration across research programmes and their supporting platforms in Bangladesh, Bhutan, India, Indonesia, Malaysia, Pakistan and Sri Lanka

Visit this poster display to learn how RESPIRE's studies, programmes and platforms work together to enable world-leading research to reduce the burden of respiratory disease.

Programmes and studies: https://www.ed.ac.uk/usher/respire/research
Supporting platforms: https://www.ed.ac.uk/usher/respire/platforms

2 Open Science, Data, and Methodologies: Lessons learned from NIHR-RESPIRE Network in Asia

Tapas Kumar Mohanty[1,2]; Jayakayatri Jeevajothi Nathan[2,4]; Dhiraj Agarwal[1,2]; Simon Smith[2]; Tathagata Bhattacharjee[2,3]; John Norrie[2]

[1]Vadu Rural Health Program, KEM Hospital Research Centre, Pune, India; [2]NIHR Global Health Research Unit on Respiratory Health (RESPIRE), University of Edinburgh, UK; [3]Department of Population Health, London School of Hygiene & Tropical Medicine, UK; [4]Department of Primary Care Medicine, Universiti Malaya, Kuala Lumpur, Malaysia

NIHR-RESPIRE, a Global Health Research Unit funded by NIHR, is committed to advancing respiratory health research in Asia. We prioritise Open Science, Data, and Methodologies to maximise research data utility securely, sharing the lessons encountered across seven LMIC partner countries (Bangladesh, Bhutan, India, Indonesia, Malaysia, Pakistan, and Sri Lanka). Our strategic shift from traditional data sharing to LMIC-tailored Open Science practices ensures data privacy and security. This includes refining Data Management Plans, metadata standards, and mandating FAIR Data sharing, providing methodological support, and developing Open Science Policy Guidelines.

We advocate for the adoption of open science principles to maximise secure data use and value with a focus on FAIR data. We also provide aid to partners in enhancing their data-related skills, hosting regular meetings, and establishing internal data monitoring structures to bolster cross-cutting activities within RESPIRE. Through capacity building, we have enabled high-quality respiratory health research using Open Science principles, enhancing data sharing efficiency, research visibility, and ultimately respiratory health outcomes in Asia and beyond.

Our experience underscores the following lessons: (1) Flexibility in data sharing, tailored to LMIC researchers' needs, is essential; (2) Training and support to enhance knowledge of methodologies and dispel misconceptions are key to successful data stewardship; (3) Appointing a focal person for structured anonymised data sharing and supporting the internal Data Monitoring Committee are critical. We recognise Open Science's potential to foster innovation, collaboration, and knowledge sharing in respiratory health research.

https://www.ed.ac.uk/usher/respire/platforms/open-science-data-methodologies

3 Mapping Respiratory Health Digital Interventions in South and Southeast Asia: A Scoping Review

Laura Evans[1], Jay Evans[1], Dr Adina Abdullah[2], Dr Zakiuddin Ahmed[3]

[1]Usher Institute, University of Edinburgh, Edinburgh, UK; [2]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [3]Ripah Institute of Healthcare Improvement and Safety, Islamabad, Pakistan

Background
Digital health interventions (DHIs) have expanded in the last two decades while the global burden of respiratory disease continues growing. Leveraging DHIs to manage and mitigate respiratory disease and its adverse health effects is an obvious path forward.

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Objectives
To understand the current digital landscape around respiratory health to reduce costs, avoid duplication of future DHIs, and understand their comprehensiveness.

Methodology
This study followed a scoping review methodology. Peer-review and grey databases were searched. The terms "respiratory health," "digital health," "South Asia," and "Southeast Asia" constituted the search strategy. 10468 studies were screened, and 163 studies were included for analysis.

Challenges and early results
- The number of relevant results covering COVID-19 was high (~250). However, due to its multi-organ impact and the potential ephemerality of those DHIs, we decided to exclude those results from this study.
- Among the included studies, interventions using machine learning (ML) and artificial intelligence (AI) are the most common. Self-management, telemedicine, and SMS reminder interventions were also prevalent.
- ML and AI are being employed in each of RESPIRE2's three programmes: infectious diseases, non-communicable diseases, and preventable risk factors.

Expected impact
This scoping review shows that the use of ML and AI is highly prevalent among partner countries yet immature. It is primarily linked to research studies and pilot projects. This review should inform future DHIs, especially those looking at utilising ML and AI, making sure that they build on what is already known, not duplicating previous work so that new interventions are more scalable and reach a wider population.

https://www.ed.ac.uk/usher/respire/platforms/digital-health-innovation

4 Effects of indoor air pollution on respiratory health outcomes of pregnant women, infants and children in Sri Lanka

Dulshan Jayasinghe[1], Chanaka Karunarathne[1], Akindra Kariyawasam[1], Gayani Kanchana[1], Damith Nissanka[2], Lakshani Kaushalya[2], Savithri Wimalasekera[1], Dushantha Madegedara[3], Duminda Yasaratne[2], Sampatha Goonewardena[1], Thamara Amarasekara[1], Pathum Dissanayake[2], Gayan Bowatte[2], Himansu Waidyasekera[1], Lalindra Kaththiriarachchi[4], Chun Lin[5], Jurgen Schwarze[5]
[1]University of Sri Jayewardenepura, Sri Lanka; [2]University of Peradeniya, Sri Lanka; [3]Wayamba University of Sri Lanka; [4]General Sir John Kotelawala Defence University, Sri Lanka; [5]Usher Institute, University of Edinburgh, UK

Research question
Does exposure to indoor air pollution (IAP) affect the respiratory symptoms and lung function of pregnant women, infants and children under 5 years?

Background
About 2.4 billion people are exposed to IAP mainly from stoves using biomass fuel worldwide. Mothers who often perform the cooking and young children who reside at home are significantly exposed to fumes of biomass fuel. In Sri Lanka's rural areas, most households use firewood as cooking fuel.

Methodology
- This study will be conducted as an 18-month prospective longitudinal study recruiting 330 families in rural and urban settings in Colombo and Kandy districts of Sri Lanka. Outcomes of participants in households exposed to high and low levels of IAP will be compared.
- Respiratory symptoms will be assessed by questionnaires. Portable lung oscillometer will be used to assess lung function, in terms of resistance and reactance of the lung at various ultrasonic wavelengths, in pregnant women and children. Additionally, exhaled carbon monoxide and fractional exhaled nitric oxide will be measured in pregnant women.
- Validated optical air pollution monitors, will be used to measure indoor fine particulate matter (PM2.5) concentrations, temperature and relative humidity.

Challenges/opportunities
We anticipate accessibility issues for visiting many rural households and familiarising participants with new lung function devices. The study will empower and engage the community.

Expected impact
Research findings will:
- help the participants to change behaviours to protect their respiratory health
- inform policy-making to protect people from the harms of IAP

https://www.ed.ac.uk/usher/respire/research/preventable-risk-factors/current/aq-indoor

5 Effects of Indoor Air Pollution (IAP) on quality of life (QOL) of pregnant women in Sri Lanka

Akindra Kariyawasam[1], Dulshan Jayasinghe[1], Chanaka Karunarathne[1], Gayani Kanchana[1], Damith Nissanka[2], Lakshani Kaushalya[2], Savithri Wimalasekera[1], Dushantha Madegedara[3], Duminda Yasaratne[2], Sampatha Goonewardena[1], Thamara Amarasekara[1], Pathum Dissanayake[2], Gayan Bowatte[2], Himansu Waidyasekera[1], Lalindra Kaththiriarachchi[4], Chun Lin[5], Jurgen Schwarze[5]
[1]University of Sri Jayewardenepura, Sri Lanka; [2]University of Peradeniya, Sri Lanka; [3]Wayamba University of Sri Lanka; [4]General Sir John Kotelawala Defence University, Sri Lanka; [5]Usher Institute, University of Edinburgh, UK

Background
Indoor Air Pollution (IAP) is a significant public health concern, especially in developing countries where plant-based materials are commonly used for cooking and heating. Pregnant women are particularly vulnerable to IAP due to prolonged exposure, adversely affecting their health and quality of life.

Research Question/Objectives
This study investigates the effects of IAP on the health, nutritional status, and quality of life of pregnant women in Colombo and Kandy, Sri Lanka. Objectives include assessing indoor particulate matter (PM2.5) levels, respiratory health, physical activity, psychological status, sleep quality, nutritional status, quality of life, and perceptions of IAP among pregnant women.

Methodology
A community-based prospective longitudinal study will enroll 300 pregnant women from Colombo and Kandy. Around 15-20 in-depth interviews will assess perceptions of women on health effects of exposure to IAP. Data will be collected through air quality monitoring, health assessments, nutritional evaluations, quality of life surveys, and qualitative interviews.

Challenges/Opportunities Encountered So Far
Challenges of infrastructure, cultural practices, use of equipment in field settings, plus nutritional and environmental complexities are anticipated. However, it offers opportunities for community engagement, policy influence, health interventions, capacity building, and collaborative research to improve outcomes for pregnant women.

Expected Impact
The study will determine the effects of IAP on health of pregnant women, providing comprehensive insights into the interplay between IAP exposure and maternal health. Findings will inform health policy planners to adopt remedial acceptable interventions to reduce IAP exposure, to improve health/quality of life of pregnant women and their unborn children in Sri Lanka.

https://www.ed.ac.uk/usher/respire/research/preventable-risk-factors/current/aq-indoor

6 Development of a mobile healthcare application with a high-resolution air quality forecast as an early warning system among patients with asthma.

Adina Abdullah[1], Wei Leik Ng[1], Norita Hussein[1], Ping Yein Lee[2], Chin Hai Teo[1,2], Chee Sun Liew[3], Norimichi Hirahara[2], Chee Kuan Wong[4], Chun Lin[5], Wee Cheah[6], Chng Saun Fong[7], Yong Kek Pang[4], Nasrin Aghamohammadi[8], Mohd Talib Latif[9], Maggie Chel Gee Ooi[10], Jenny Stocker[11], Kate Johnson[11], Nik Sherina Hanafi[1], Siti Nurkamilla Ramdzan[1], Rizawati Ramli[1], Ai Theng Cheong[12], Sazlina Shariff Ghazali[12], Poh Ying Lim[13], Hani Syahida Salim[12], Jay Evans[5], Bee Kiau Ho[14], Hilary Pinnock[5], Ee Ming Khoo[1]

[1]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [2]UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Malaysia; [3]Department of Computer System & Technology, Faculty of Computer Science and Information Technology, Universiti Malaya; [4]Department of Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [5]NIHR Global Health Research Unit on Respiratory Health (RESPIRE), Usher Institute, The University of Edinburgh, United Kingdom; [6]Institute of Ocean and Earth Sciences, Universiti Malaya, Malaysia; [7]Institute for Advanced Studies, Universiti Malaya, Malaysia; [8]Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [9]Department of Earth Sciences and Environment, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Malaysia; [10]Center for Tropical Climate Change System, Institute of Climate Change, Universiti Kebangsaan Malaysia, Malaysia; [11]Cambridge Environmental Research Consultants, United Kingdom; [12]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia; [13]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia; [14]Botanik Health Clinic, Klang District, Ministry of Health, Malaysia

Research question

How to develop a mobile healthcare application with high-resolution air quality forecast as an early warning system among patients with asthma?

Background

Air pollution can lead to poor asthma control. Existing mobile applications (apps) display indoor/outdoor air quality but none incorporate alerts for people with asthma. We aimed to develop an app with high-resolution air quality forecast with early warning system for people with asthma to reduce asthma morbidity.

Methodology

We used the Agile Development Framework. A team of app developers and clinicians discussed requirements. The developers developed the app in short sprints and tested it internally among the clinicians. Several cycles of alpha and beta testing were conducted with stakeholders including clinicians, NGOs and patients with asthma. The users' comments were used to refined the app.

Results

The app has five major functionalities:

- Registration: Gathers minimal user biodata and GINA asthma-control assessment questions.
- Air-quality alert set-up: Users choose the notifications types and reminder timings.
- Settings: Users can view information about the app, manage their account and choose their preferred language.
- Forecast: Displays forecast AQ data for the next 2 days, displayed in a traffic light colour gauge meter and prompts suitable actions.
- Air Quality Map: The hour-by-hour forecast data for air pollution parameters are displayed on the map.

The agile development approach has allowed expedient app development, facilitating development of interactive and simple to use interfaces.

Expected impact

A mobile healthcare application with high-resolution air quality forecast has the potential to be an effective early warning system to improve asthma control.

https://www.ed.ac.uk/usher/respire/research/preventable-risk-factors/current/aq-haze

7 The challenges in accessing air quality data from a middle-income country for the development of a street scale-resolution air quality forecast system using the Atmospheric Dispersion Modelling System (ADMS) Urban model

Norita Hussein1, Chun Lin2, Wee Cheah3, Chng Saun Fong4, Adina Abdullah1, Wei Leik Ng1, Ping Yein Lee5, Chin Hai Teo1,2, Chee Sun Liew6, Norimichi Hirahara 5, Chee Kuan Wong7, Yong Kek Pang7, Nasrin Aghamohammadi8, Mohd Talib Latif9, Maggie Chel Gee Ooi10, Jenny Stocker11, Kate Johnson11, Nik Sherina Hanafi1, Siti Nurkamilla Ramdzan1, Rizawati Ramli1, Ai Theng Cheong12, Sazlina Shariff Ghazali12, Poh Ying Lim13, Hani Syahida Salim12, Jay Evans2, Bee Kiau Ho14, Hilary Pinnock2, Ee Ming Khoo1

1Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia ; [2]NIHR Global Health Research Unit on Respiratory Health (RESPIRE), Usher Institute, The University of Edinburgh, United Kingdom; [3]Institute of Ocean and Earth Sciences, Universiti Malaya, Malaysia; [4]Institute for Advanced Studies, Universiti Malaya, Malaysia; [5]UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Malaysia; [6]Department of Computer System & Technology, Faculty of Computer Science and Information Technology, Universiti Malaya; [7]Department of Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [8]Department of Social and Preventive Medicine, Faculty of Medicine, Universiti Malaya, Malaysia; [9]Department of Earth Sciences and Environment, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Malaysia; [10]Center for Tropical Climate Change System, Institute of Climate Change, Universiti Kebangsaan Malaysia, Malaysia; [11]Cambridge Environmental Research Consultants, United Kingdom; [12]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia; [13]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia; [14]Botanik Health Clinic, Klang District, Ministry of Health, Malaysia

Background

Half the participants of the RESPIRE Klang Asthma Cohort study reported haze triggered their asthma. Exposure to haze was significantly associated with poor control (OR 1.51; 95% CI 1.13-2.01) and every 10 µg/m3 increase in PM10 increased the relative risk of an asthma exacerbation by 8.7% (RR 1.087; 95% CI 1.023-1.155). A forecasting model could alert these patients to take timely preventative action. Thus, we proposed to use an Atmospheric Dispersion Modelling System (ADMS)-Urban model to provide a 2-day advance forecast to be displayed in a mobile application.

Research question

What were the challenges in accessing air quality and other input data to achieve a good air-quality forecast system in Malaysia?

Methodology

The ADMS-Urban model (Cambridge Environmental Research Consultants (CERC)) uses a physics-based approach and incorporates background air quality measurements, emission inventories, meteorological and urban morphological data to ensure reliability and suitability.

Challenges

Three main challenges were faced when accessing Malaysia's air quality and other input data -

- Data fragmentation: Data availability is dispersed across various agencies in different ministries, necessitating engagement with multiple agencies. Within these agencies, data ownership is further fragmented among smaller departments.
- Uncertain data availability: Few departments have poor data collection records, and data may be faulty or incomplete even if available.
- Restricted accessibility: Some data are not publicly accessible, with a lengthy application process including requesting a fee waiver for research purposes.

Expected impact

Data fragmentation, uncertain data availability, and restricted accessibility significantly hindered the progress of air quality research in Malaysia.

https://www.ed.ac.uk/usher/respire/research/preventable-risk-factors/current/aq-haze

8 A mHealth intervention (mTB-Tobacco) for smoking cessation in people with tuberculosis: Cluster Randomized Controlled Trial

Maham Zahid[1], Fahmidur Rehman[2], Shakhawat Hossain Rana[2], Amina Khan[1], Rumana Huque[2], Kamran Siddiqi[3]
[1]The Initiative Pakistan; [2]ARK Foundation Bangladesh; [3]University of York UK

Background
To address the challenges of integrating face-to-face behavioural interventions for smoking cessation among TB patients, a mHealth package was developed to deliver smoking cessation support via SMS messages.

Objective
To assess the effectiveness and cost-effectiveness of mTB-Tobacco in achieving continuous abstinence for at least six months among TB patients; along with enhancing TB treatment adherence and improving clinical outcomes

Study design
A multi-centre, cluster 6andomized, controlled trial, was proposed for this study, comprising four phases recruiting 2,700 smokers with TB from Pakistan and Bangladesh.

Preliminary findings
The SMS content was refined after the input of the PPI group (phase 1), involving translation adjustments, the addition of a few new messages, and optimised frequency and timings of SMS messages. In the Pilot (Phase 2), 16 TB patients (8 per country) were enrolled at 4 TB sites. At the 9-week follow-up, successful synchronisation between the REDCap database and mTB-Tobacco portal was achieved. The portal effectively delivered messages to intervention patients, excluding controls. Patients reported satisfaction with message frequency, quantity, timing, and length. In Phase 3-Superiority Trial (mTB-Tobacco vs Usual Care), by May 2024, 1015 (93.9%) out of a total sample of 1080, new pulmonary TB patient-smokers were recruited consisting of 34 females (3.4%) and 981 males (96.6%). The smoking prevalence among screened TB patients was 23.0% (2070 out of 8959). There were 16 deaths, and 3 withdrawals. Phase 4-Non-inferiority trial comparing mTB-Tobacco to behavioural support will commence after the final analysis of phase 3, contingent upon proving mTB-Tobacco's effectiveness over usual care.

Expected impact
This study will strengthen our existing engagement with the TB control programmes and help them in adopting the most cost-effective approaches to smoking cessation.

https://www.ed.ac.uk/usher/respire/research/preventable-risk-factors/current/quit4tb

9 Smear Negative Pulmonary TB (SNPT): Still a major diagnostic problem in LMICs

Wai Khew Lee[1], Chee Kuan Wong[2], Ee Ming Khoo[2], Helen Stagg[3], Harish Nair[4], Harry Campbell[4], Karuthan Chinna[5], Long Lew Yao[6], Jane Jia Chyi Chan[1], Suhashini Sivasegaran[1], Hema Yamini Ramarmuty[1], Jiloris Dony[1], Roddy Teo[1], Giri Shan Rajahram[1], Timothy William[7], Jayakayatri Jeevajothi Nathan[2], Yin Chin Chan[1], Ri Hui Lam[1]
[1]Ministry of Health, Malaysia; [2]University of Malaya, Kuala Lumpur, Malaysia; [3]London School of Hygiene & Tropical Medicine, London, United Kingdom; [4]University of Edinburgh, United Kingdom, [5]UCSI University, Kuala Lumpur, Malaysia; [6]Menzies School of Health Research, Darwin, Australia; [7]Subang Jaya Medical Centre, Petaling Jaya, Malaysia

Background
TB remains the single infection that causes the highest mortality in the world after the Covid-19 pandemic. Annually, 10.6 million people fell ill with TB and 10% succumbed to it. Early and correct diagnosis is pivotal to achieve World Health Organisation's goal to end the global TB epidemic by 2035.
Globally, only 55%-63% of new pulmonary TB cases are bacteriologically confirmed. Most smear negative pulmonary TB (SNPT) are treated empirically. SNPT leads to continuous transmission in the community, spread of MDR-TB, worse treatment outcomes and misdiagnoses which could be fatal. Molecular rapid tests have been proven to improve the diagnosis and are touted as the 'game-changer'. Unfortunately, the high cost is prohibitive for many lower-and-middle income countries (LMICs).

Study Objective
To develop and validate a clinical algorithm scoring system (CASS) that is non-inferior to Xpert® MTB/RIF Ultra to diagnose TB among suspected SNPT patients.

Methods
The CASS will be developed by a panel of experts using the modified Delphi method. It will be tested prospectively in Sabah, the state with the highest incidence of TB in Malaysia by comparing it with the Xpert® MTB/RIF Ultra rapid test with the TB culture as the gold standard.

Impact
- If the CASS is proven to diagnose SNPT accurately, doctors in remote areas can initiate TB treatment without delay or additional costs to patients and the health system.
- It is possible to adjust the CASS using artificial Intelligence (AI) to keep it up-to-date or to be used in other countries.

https://www.ed.ac.uk/usher/respire/research/infectious-diseases/current/amassment

10 Designing a complex intervention to find the 'missing millions' in tribal communities in Maharashtra, India: A Systematic Review of barriers, enablers and interventions

Dr. Ashish Satav, Dr. Dhananjay Raje, Dr. Vibhawari Dani, Dr. Radha Munje, Dr. Dipti Jain, Dr. Sanjay Zodpey, Dr. Shraddha Kumbhare, Dr. Mansi Shelgaonkar, Professor Hilary Pinnock, Professor Helen Stagg

Background
Previous work (2015) among tribal communities in India has revealed a very high burden of tuberculosis at 7,030 per million. The diagnosis and notification gap in tribal communities is known to be substantial, partly due to the remoteness of many of these populations. Within an over-arching study to design a complex intervention to find the 'missing millions' among tribal communities, we undertook a systematic review to determine the barriers and enablers of tuberculosis diagnosis and notification and identify successful interventions in similar populations.

Methodology
We searched PubMed, Embase and Web of Science on September 26, 2023 using search terms around tuberculosis, diagnosis, notification, barriers, enablers and interventions. We sought to identify studies from lower- and lower-middle-income countries (LIC & LMIC) published between 2000-2023,. Studies were quality assessed using Critical Appraisal Skills Programme tool and adapted New-Castle Ottawa scale. Narrative and thematic analyses were performed using the socio-ecological model (SEM) for barriers and enablers, and consolidated framework for implementation research (CFIR) for interventions.

Results
34 eligible studies were found from 15 countries. Included studies revealed an array of barriers and enablers, from the individual and interpersonal to the policy level (Figure 1). We mapped where intervention studies had sought to address these enablers and barriers, including providing transport to resolve issues of distance, and bringing services to communities.

Conclusions
Enablers, barriers, and potential intervention routes identified by this review form an initial theory of change and logic model for our complex intervention. This model will be further development and refined through interviews and focus groups, before undergoing feasibility testing.

https://www.ed.ac.uk/usher/respire/research/infectious-diseases/current/mtbht

11 Scoping Review: Policies to Improve Air Quality in India

Rachel Immanuel[1]; Sharon Jose[1], Paul Jebaraj[1], Biswajit Paul[1], Mansi Tyagi [1], Rita Isaac [2], Genevie Fernandes[3], David Weller[3], Hilary Pinnock [3]
[1]Christian Medical College, Vellore, India, [2]Karakinos Foundation, [3]Usher Institute, University of Edinburgh, UK

Background
Air quality-related health hazards are a significant global concern, with approximately 7 million annual deaths due to polluted air1. People living in experience the burden of ambient air pollution with 89% of the 4.2 million premature deaths occur in low- and middle-income countries (LMICs); it is the second highest risk factor for noncommunicable diseases. Fourteen Indian cities are among the world's most polluted for PM2.52. At this point, evaluating current policies and engaging stakeholders is crucial.

Research question
What is known about policies developed and implemented to improve air quality in India and the barriers and facilitators in achieving these policy goals?'

Methodology
The review includes qualitative and quantitative studies, policy analysis, and service and evaluation reports from published and the grey literature. This scoping review is be guided by the PCC3 (population, concept, context) framework. PRISMA-ScR4 checklist and guide will be used for framing the protocol and reporting the study. The selection process includes initially reviewing titles and abstracts from electronic databases like MEDLINE, PubMed, and Google Scholar/ Scopus and selecting studies for full review that meet the full inclusion criteria. The searches are being performed by two researchers. Policies to improve air quality or address air pollution are the phenomenon under consideration. Relevant information will be extracted using a standard data extraction form and results will be presented through narrative synthesis.

Impact
This evidence synthesis will be critical for capacity building and transformation to a greener environment and to inform policy.

12 Identifying vulnerable communities and their experiences related to climate change and respiratory health and creating awareness through community engagement

Manoj Jacob[1], Dhingar Udayakumar[1], Paul Jebaraj[1], Biswajit Paul[1], David Weller[2], Hilary Pinnock [2]
[1]Christian Medical College, Vellore, India, [2]Usher Institute, University of Edinburgh, UK

Background
There has been a doubling of the climate related disasters in last 20 years throughout the world with major burden of mortality in the low- and middle-income countries (LMIC) affecting vulnerable communities with its impact on (respiratory) health and livelihoods.

Objectives
- To identify communities vulnerable to climate change and study the adverse respiratory health effects in them
- To create awareness about health (respiratory) vulnerability to climate change through capacity building and stakeholder engagement

Methodology
Vulnerable communities will be identified using the existing United Nations Framework Convention on Climate Change (UNFCCC)1 recommendations using a triangulation between targeting, vulnerability and community based participatory techniques. We will choose those groups or populations which have had adverse respiratory health effected by climate change and produce case studies using qualitative research methods like phenomenology. We

will create awareness about health (respiratory) vulnerability to climate change through Community Advisory Committee and community meetings. The cultural sensitivity and the local beliefs and customs will be accounted for while developing health education programs and communication methods. Role play, puppet shows, video shows and mime shows will be conducted to create awareness among communities.

Expected impact
The identification of various vulnerable groups, occupations and communities will help in providing powerful narratives about health problems created by climate change, help in increasing awareness, mitigate challenges and search for solutions in this low-literate, rural-poor and marginalised populations.

13 Adaptation strategies and Physiological Responses to Weather Variability, among persons with chronic respiratory diseases (CRDs) in Rural India: Vadu HDSS experience

Dr Dhiraj Agarwal[1], Dipali Dhamdhere[1], Dr Anand Kawade[1], Dr Parag Khatvkar[1], Jacques Prioux[2], Joy Merwin Monteiro[3]
[1]Vadu Rural Health Programme, KEM Hospital Research Centre, Pune, India, [2]Ecole Normale Supérieure in Rennes (France), [3]Departments of Earth and Climate Science and Data Science at the Indian Institute of Science Education and Research Pune, India

Background
Climate change and extreme weather conditions affecting health of vulnerable populations with chronic respiratory diseases (CRDs). Effective interventions and early warning systems require understanding physiological and behavioural responses to heat stress and poor air quality in individuals with CRD. However, data on these responses in rural Indian population is limited. This study aims to investigate physiological and behavioural responses to heat stress in the elderly population with CRDs.

Objectives
The primary objective is to assess the relationship between heat stress and strain in individuals with CRDs compared to healthy individuals, and to evaluate the impact of heat stress on their ability to perform physical activity. The secondary objective is to assess the impact of air quality on health and identify behavioural adaptation strategies to extreme heat.

Methodology
A mixed methods approach will be used, involving 40 participants (20 with CRDs & 20 healthy participants), aged 60 & above. Data on physical activity (using wearable accelerometers) and physiological stress and strain (skin temperature, heart rate, its variability) during the 6-minute walk test (6-MWT) will be captured along with air quality measurements. In-depth interviews (IDIs) & focus group discussions (FGDs) will gather data on behavioural adaptation strategies.

Opportunities
To generate knowledge for design of early warning systems, understand extant adaptation strategies to heat stress for better study implementation.

Expected impact
Improve understanding of impacts of heat stress on a vulnerable population and local adaptation of strategies. Integration of physiological and behavioural data could inform better public health interventions and policies.

14 A scoping review for TOOLKIT development to improve health systems for climate change and health (respiratory) in lower- and middle-income countries (LMICs)

Dr. Biswajit Paul[1], Mr. Paul Jebaraj[1], Dr. Manoj Jacob Dhinagar[1], Dr. Udayakumar[1], Dr. Ruth McQuillan[2]
[1]RUHSA Department, Christian Medical College, Vellore, [2]Usher Institute, University of Edinburgh, UK

Background
Health providers response to climate change and respiratory health in lower-and middle-income countries (LMIC's), and knowledge, skills or competencies required by them, and capacity building of health systems to respond and mitigate health effects due to climate change is need of the hour as the climate change is expected to cause at least 250 000 deaths every year globally by 2050 (Vicedo-Cabrera AM, 2023)

Research questions
- What knowledge, skills or competencies are required of health providers to respond to health effects/conditions (including respiratory) arising and or aggravated by climate change in LMIC's?
- How should the health providers respond to the climate change and respiratory health in LMIC's? and
- How to build climate resilient health systems so as to respond and mitigate health effects due to climate change and respiratory health in LMIC's?

Methodology
This scoping review will be guided by the PCC framework (population, concept, context). Electronic databases (MEDLINE, Web of Science, Cochrane Library, Global Health, and CINAHL) will be searched for peer-reviewed journals and grey literatures published between 2000 to 2023 written in any language. The search terms:
Population Health providers response, health providers knowledge/skill/competency, health systems response, Concept Climate change, respiratory health, Context Low- and middle-income countries

Following a calibration exercise, three independent reviewers will screen titles and abstracts in covidence software and identify potential eligible studies. After retrieval of the full text of potentially eligible studies, three reviewers will independently screen the studies against the selection criteria. Disagreement in both stages will be resolved by consensus.

Expected impact
Following narrative synthesis of evidence, a toolkit will be developed to train health providers and to improve health systems for climate change and respiratory health in LMICs.

References
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15 Assessing short-term effects of particulate matter on Outpatient Department (OPD) presentations with acute respiratory infection in children under five in Islamabad, Pakistan

Hana Mahmood, Saleem Abbasi, Hira Kiani & Syed Yahya Sheraz
Neoventive Solutions Pakistan

Background
Climate change is deteriorating air quality, which is emerging as a silent killer. Acute Respiratory illnesses (ARI) are affecting millions and approximately 10% under 5 deaths are linked to polluted air. Pakistan's AQI range from 300-500 i.e. hazardous. The link of air pollution with ARI is well known, however, there is no local data regarding air quality and its effects on ARI.

Research question
Is the air quality index of urban and peri-urban Islamabad related to ARI in under 5 children and how often it leads to severe morbidity and/or mortality?

Objectives
Primary:
- To investigate the temporal correlation between fluctuations in outdoor air quality and the frequency of healthcare facility visits due to acute respiratory infections among under five children, in both peri-urban and urban areas of Islamabad

Secondary:
- To estimate the variation of air quality index in urban and peri-urban areas.
- To analyze the short-term effects of particulate matter on paediatric respiratory health, considering the interplay of air pollution, climate change, and allergic reactions.
- To relate the sociodemographic characteristics of children with poor air quality and resultant pneumonia severity and mortality

Research Methods
Study design: An ecological study
Study population: Under 5 children presenting with a respiratory episode in selective facilities

Challenges encountered
Co-morbidity among children and confounders

Probable impact of study
ARI is still highly prevalent, thus, exploring the probable correlation of poor air quality with ARI would be ideal, firstly, to fill this gap, and secondly, to develop hypotheses regarding cause and effect and thirdly, to address this issue, if proven significant.

16 Scale up of pulse oximetry in outdoor management of childhood illnesses in Bangladesh: a hybrid effectiveness implementation study

Ahmed Ehsanur Rahman[1], Shafiqul Ameen[1], Sadman Sowmik Sarkar[1], Sabit Saad Shafiq[1], Md. Jahurul Islam[2], Shams El Arifeen[1]
[1]International Centre for Diarrhoeal Disease Research, Bangladesh, [2]Directorate General of Health Services, Ministry of Health and Family Welfare, Dhaka, Bangladesh

Background
Pneumonia remains a prominent contributor to child mortality in Bangladesh. The association between hypoxemia and pneumonia-related hospitalizations and deaths is well-established. To address this issue, the World Health Organization (WHO) advocates for the integration of pulse oximetry (PO) – a non-invasive method for assessing oxygen saturation – into routine Integrated Management of Childhood Illness (IMCI) services in resource-constrained countries.

Research objectives
The study aims to assess the effectiveness of introducing PO in routine IMCI settings in Bangladesh. The secondary objective is to assess the implementation outcomes of introducing pulse oximetry during national scale-up.

Methodology
This will be a hybrid effectiveness-implementation study during scaling up PO in IMCI services of Bangladesh employing a stepped-wedge cluster randomized controlled trial design in three districts of Bangladesh. Trained study nurses will conduct structured observations of IMCI service-providers conducting PO assessments on children presenting with cough/difficulty-in-breathing, and extract data from the IMCI services registers. After that, a separate group of trained study nurses will conduct reassessments of the enrolled children. Trained study staff will conduct community follow-up of the enrolled children classified as pneumonia by IMCI service-providers on day-6. Also, a qualitative method of data collection will be employed to assess implementation outcomes.

Expected impact
The study seeks to elucidate the effectiveness of integrating PO into routine IMCI services, ultimately improving childhood pneumonia classification, and reducing mortality rates. The study will also provide valuable insights to the Government of Bangladesh for making evidence-based decisions during the national scale-up of PO in routine IMCI services.

https://www.ed.ac.uk/usher/respire/research/infectious-diseases/current/po-hybrid-implementation

17 RESPIREing "Lancet Global Health Commission on Medical Oxygen Security

Ahmed Ehsanur Rahman[1], Shams El Arifeen[1], Harry Campbell[2]
[1]International Centre for Diarrhoeal Disease Research, Bangladesh, [2]Usher Institute, University of Edinburgh, UK

Background
Hypoxemia, a condition characterized by low oxygen saturation in the blood, poses a significant threat to health worldwide. Among children and adults facing various acute respiratory and non-respiratory conditions, hypoxemia remains a critical concern. Despite its status as a powerful predictor of in-hospital mortality, timely identification and appropriate oxygen therapy can significantly mitigate this burden. However, a substantial proportion of those requiring oxygen therapy face barriers in availing functional oxygen services, particularly in low and middle-income countries with limited resources. Regrettably, evidence regarding global oxygen needs, access, and coverage remains scarce.

Research question/objectives
In response to this pressing issue, the Lancet Global Health launched the Commission on Medical Oxygen Security in September 2022. This ambitious initiative aims to address evidence gaps and foster concerted efforts toward ensuring universal access to medical oxygen when needed.

Methodology
The commission is hosted by two institutes based on global south, and is managed by a six-member Executive Committee, governed by 20 commissioners, and supported by 40 advisors. Notably, icddr,b, a key partner of RESPIRE, co-hosts the commission. Within this framework, Dr. Ahmed Ehsanur Rahman, who completed his PhD with RESPIRE funding, serves as an esteemed member of the Executive Committee. Additionally, senior leaders of RESPIRE, Dr. Harry Campbell and Dr. Shams El Arifeen, actively contribute as commissioners.
The commission's work is divided into four distinct work packages. Work Package 1, led by Dr. Harry Campbell, focuses on estimating global oxygen needs across acute medical conditions, peri-operative care, and long-term oxygen therapy for chronic conditions. Dr. Shams El Arifeen contributes as one of the commissioners, and Dr. Ahmed Ehsanur Rahman serves as the focal person of Work Package 1. Importantly, these experts also play vital roles in other work packages, ensuring a comprehensive approach.

Expected impact
The impact of the commission's advocacy efforts has been profound. In 2023, it played a pivotal role in passing a resolution on oxygen security during the World Health Assembly. Subsequently, the formation of GOAL, a high-level committee comprising international agencies and donors, aims to advance this critical agenda. The commission's comprehensive report, slated for publication in the first quarter of 2025, will serve as a beacon. Pooled evidence from this report will attract attention, drive investment, and strengthen medical oxygen systems. As we prepare for future pandemics and address the needs of millions lacking access to essential oxygen, RESPIRE remains at the forefront of this vital endeavor.

18 Evaluating the Oxygen Preparedness & Security in LMICs: A Mixed-Methods Approach for Oxygen Survey

Ahmed Ehsanur Rahman[1], Dr. Shabina Ariff[2], Dr. Divas Kumar[3], Dr. Mimi Lhamu Mynak[4], Shafiqul Ameen[1], Sabit Saad Shafiq[1], Sadman Sowmik Sarkar[1], Hareem Fatima[2], Fareeha Javaid[2], SN Singh[3], Shams El Arifeen[1]
[1]International Centre for Diarrhoeal Disease Research, Bangladesh, [2]Aga Khan University Hospital, Pakistan, [3]King George's Medical University, India, [4]JDW National Referral Hospital, Bhutan

Background
It has been demonstrated that oxygen is a crucial medicinal treatment that can save lives. For healthcare to be effective, oxygen delivery systems must be ready, functional, and available. However, differences in access to oxygen have been made visible in low-resource settings.

Research Questions
This research aims to assess the oxygen delivery mechanisms in Bangladesh, Bhutan, India, and Pakistan to improve oxygen security and access. The key research questions include: (1) To assess the current policies and strategies related to oxygen delivery systems. (2) Examine the availability, readiness, and functionality of oxygen delivery systems (3) To investigate service providers' knowledge, attitude, and skills, as well as patients' perceptions of oxygen therapy (4) Assess the documentation practices of oxygen use by examining factors such as adherence to guidelines and rational use (5) To understand the financial implications of implementing and maintaining an oxygen system.

Possible Methodology
The research design will employ a mixed-method approach, encompassing the following components: a) Cross-sectional health facility assessments, b) Surveys of healthcare providers and caregivers, and c) Key informant interviews (KIIs). Data collection will involve interviews with open-ended questions, structured questionnaires, and extraction forms.

Expected impact
This research is anticipated to revolutionize the oxygen delivery system and enhance healthcare facilities' overall medical oxygen environment. Furthermore, the results of this study will enable policymakers, healthcare practitioners, and international health organizations to develop an evidence-based oxygen supply network.

https://www.ed.ac.uk/usher/respire/research/infectious-diseases/current/oxygen-security

19 Acceptability of respiratory syncytial virus (RSV) vaccine: a qualitative study in India and Pakistan

Sajid Bashir Soofi[1,2], Girish Dayma[3], Dhiraj Agarwal[3], Aditi Apte[3], Shabina Ariff[1]
[1]Department of Pediatrics & Child Health, The Aga Khan University, Karachi, Pakistan, [2]Center of Excellence in Women & Child Health, The Aga Khan University, Karachi, Pakistan, [3]Vadu Rural Health Program and Community Health Research Unit KEM Hospital Research Centre, Pune, India.

Background
RSV is a major cause of lower respiratory infections in young children worldwide, with most cases and deaths occurring in low- and middle-income countries. Limited healthcare access and vaccine hesitancy in these countries pose challenges to vaccinating pregnant women and providing immunity to young infants.

Research Objectives
To explore the acceptability of vaccinating pregnant women, infants, and children against RSV in India and Pakistan. This includes understanding the barriers and facilitators of RSV vaccine uptake and preferences regarding vaccine administration.

Methodology
This qualitative study will be conducted in rural and urban settings in Pune, India, and Matiari and Karachi, Pakistan. Data will be collected through in-depth-interviews (IDIs) and focus group discussions (FGDs) with stakeholders using semi-structured interview guides based on the Theoretical Framework of Acceptability (TFA) to understand factors influencing the acceptability of the RSV vaccine. Target stakeholders include pregnant women, mothers of children under two, their husbands and mothers-in-law, community leaders, community health workers, doctors, and immunization managers. Approximately 194 participants in India and 246 in Pakistan will be invited for participation in IDIs or FGDs. Thematic analysis will be used to analyze the data, and the results will be shared with stakeholders through workshops, manuscripts, and conference presentations.

Public Health Implications
By analysing the viewpoints of key stakeholders, this study can provide valuable insights to help health programs in LMICs, develop effective strategies to enhance acceptability and increase participation once an RSV vaccine becomes available.

https://www.ed.ac.uk/usher/respire/research/infectious-diseases/current/rsv-qualitative

20 Enhancing chronic respiratory disease (CRD) care through upskilling health care providers of the government health system in a rural district in India: a pre-post educational intervention trial

Biswajit Paul[1], Richa Gupta[1], Sangeetha Rathnam K[1], Rachel Immanuel[1], Paul Jebaraj[1] Rita Isaac[2], David Weller[3], Hilary Pinnock[3]
[1]Christian Medical College, Vellore, India, [2]Karakinos Foundation, [3]Usher Institute, University of Edinburgh, UK

Background
Integration of spirometry-based diagnosis and protocol-based management of Chronic Respiratory Diseases (CRD) in primary health care setup in the government setting using existing health care providers, can lead to effective treatment and better control of CRDs. The aim of this study is to provide evidence that spirometry-based diagnoses and protocol-based management is feasible in primary care and to inform policy.

Methodology
This has a one-group, pre-post, quasi-experimental study design and will be carried out in two rural blocks of Tirupattur district in Tamil Nādu, India involving government health system. Facility assessment and KAP of health providers will be done at baseline and after intervention period of 1 year to evaluate outcomes. Capacity building of health facility and skills training of health providers will be conducted and change in practices of care pathways of CRD will be measure by patient satisfaction questionnaire and KAP.

Challenges
The main challenge was obtaining approvals and ethical clearances from multiple agencies leading to a delay in implementation.

Opportunities
Technology aided digital innovations in the management of CRDs at the primary care level like digital screening tool by community health workers, patient navigation and follow up through SMS, digital clinical review forms with drop-down menus for diagnosis and treatment, teleconsultation and creation of a digital hub for connecting primary care providers with specialists.
Meetings with administrators, health care providers and community health workers in the district health office and hospitals will help understand available personnel and resources, and assess local conditions and feasibility.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/4ccord-quality-improvement-upskilling

21 Development of Pictorial Asthma Action Plan

Ai Theng Cheong[1], Sazlina Shariff Ghazali[1,2], Hani Salim[1], Fadzilah Mohamad[1], Poh Ying Lim[3], Ping Yein Lee[4], Norita Hussein[5], Nik Sherina Hanafi[5], Siti Nurkamilla Ramdzan[5], Rizawati Ramli[5], Siow Foon Tan[6], Norasnita Nordin[7], Fazlina Mohamed Yusoff[8], Zuzana Aman[9], Chee Kuan Wong[10], Ee Ming Khoo[5], Hilary Pinnock[11].
[1]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [2]Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia, [3]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [4]UM eHealth Unit, Faculty of Medicine, University of Malaya, Malaysia, [5]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia, [6]Port Klang Health Clinic, Klang District, Ministry of Health Malaysia, [7]Kapar Health Clinic, Klang District, Ministry of Health Malaysia, [8]Anika Health Clinic, Klang District, Ministry of Health Malaysia, [9]Meru Health Clinic, Klang District, Ministry of Health Malaysia, [10]Department of Medicine, Faculty of Medicine, Universiti Malaya [11]Usher Institute, The University of Edinburgh, UK

Background
Asthma action plans are used to support self-management and have been shown to improve clinical outcomes. Pictorial asthma action plans (PAAP) have the potential to benefit all patients regardless of their health literacy. We aimed to develop a culturally tailored PAAP to support patient self-management.

Methodology
A literature review was performed to inform the content of the plan. The PAAP was then designed by a graphic designer. An expert panel consisted of two respiratory physicians and three family physicians was invited to assess the relevance and clarity of the PAAP contents and graphics using a structured questionnaire. The item content validity index (I-CVI) was used for the assessment. Public, patients and healthcare providers were also invited to review the PAAP.

Results
Two PAAPs were developed: one for the preferred track (The use of combination budesonide and formoterol as preventer and reliever) and another for the alternative track (The use of inhaled corticosteroid as preventer and short-acting beta-agonist as reliever) according to GINA and Malaysia Clinical Practice Guideline for Management of Asthma. The contents and graphic designs of the PAAP had I-CVI ranging from 0.83 to 1.00 (satisfactory). The PAAP was amended based on the expert feedback and the revised version was presented to the public, patients and healthcare providers. Subsequently, the wording was further refined for ease of patients' understanding.

Conclusion
The two PAAPs developed for the preferred and alternative track according to GINA and Malaysian CPG for asthma are valid with successful engagement from various stakeholders.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/paap

22 Effectiveness of pictorial personalised asthma action plans in Malaysian public primary care clinics: Baseline profile and challenges

Ai Theng Cheong [1], Sazlina Shariff Ghazali[1,2], Hani Salim[1], Fadzilah Mohamad[s], Poh Ying Lim[3], Ping Yein Lee[4], Norita Hussein[5], Nik Sherina Hanafi[5], Siti Nurkamilla Ramdzan[5], Rizawati Ramli[5], Siow Foon Tan[6], Norasnita Nordin[7], Fazlina Mohamed Yusoff[8], Zuzana Aman[9], Chee Kuan Wong[10], Ee Ming Khoo[5], Hilary Pinnock[11]

[1]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [2]Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia, [3]Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [4]UM eHealth Unit, Faculty of Medicine, University of Malaya, Malaysia, [5]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia, [6]Port Klang Health Clinic, Klang District, Ministry of Health Malaysia, [7]Kapar Health Clinic, Klang District, Ministry of Health Malaysia, [8]Anika Health Clinic, Klang District, Ministry of Health Malaysia, [9]Meru Health Clinic, Klang District, Ministry of Health Malaysia, [10]Department of Medicine, Faculty of Medicine, Universiti Malaya [11]Usher Institute, The University of Edinburgh, UK

Background

Asthma self-management, supported by a personalised asthma action plan (PAAP), improves clinical outcomes. We developed a pictorial-PAAP to facilitate asthma self-management and to compare its effectiveness with text-based PAAP (text-PAAP). In this paper, we aimed to present the baseline profile of the participants recruited and to discuss challenges faced in recruitment.

Methodology

We recruited 180 adult asthma patients who were treated with daily inhaled corticosteroids and able to understand Malays or English. Participants would need to agree to the following requirements: 1)A 12-month commitment to the project; 2)Able to be contacted via telephone calls at each follow-up at 3-, 6- and 12-month.; 3) Allow access to their medical record. Recruited patients were randomly assigned to receive either a pictorial-PAAP or a text-PAAP via random number generator.

Results

63.9% of the participants aged <50 years, 80.0% were females, 57.8% were Malay, 84.4% had attained secondary or tertiary education, 72.8% were married, 91.1% were in the low-income category (household income ≤ RM5,249(GBP874.30;USD1118.71) and 72.8% had excellent or adequate health literacy.

Challenges/opportunities encountered

The majority of the participants who participated in this study had excellent or adequate health literacy, which differed from previous literature that showed half of the patients with asthma had limited health literacy. Reasons for not participating included not being able to understand well English and Malays, unable to commit to phone call follow-up e.g. factory workers, lorry drivers). This could lead to different outcomes than hypothesised in this trial due to differing population profile from the literature.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/paap

23 Development of an asthma care kit for healthcare providers at primary care clinics

Rizawati Ramli[1], Hooi Chin Beh[2], Norita Hussein[1], Siti Nurkamilla Ramdzan[1], Adina Abdullah[1], Nik Sherina Hanafi[1], Chin Hai Teo[1,3], Ping Yein Lee[3], Hirahara Norimichi [3], Ai Theng Cheong[4], Hani Syahida Salim[4], Sazlina Shariff Ghazali[4,5], Azainorsuzila Mohd Ahad[6], Zienna Zufida Zainol Rashid[7], Siti Fairuz Asahar[8], Yong Kek Pang[9], Chee Kuan Wong[9], Asiah Kassim[10], Ahmad Tajuddin Mohamad Nor[11], Karuthan Chinna[12], Ee Ming Khoo[1], Jurgen Schwarze[13], Hilary Pinnock[13]

[1]Department of Primary Care Medicine, Universiti Malaya, Malaysia, [2]Department of Primary Care Medicine, Universiti Malaya Medical Centre, Malaysia, [3]UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Malaysia, [4]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [5]Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia, [6]Port Dickson Health Clinic, Port Dickson, Malaysia, [7]Pandamaran Health Clinic, Klang, Malaysia, [8]Bukit Kuda Health Clinic, Klang, Malaysia, [9]Department of Medicine, Universiti Malaya, Malaysia, [10]Department of Medical Peadiatric, Clinical Research Centre, Hospital Tunku Azizah, Kuala Lumpur, Malaysia [11]Emergency and Trauma Department, Hospital Tengku Ampuan Rahimah, Klang, Malaysia, [12]UCSI University Kuala Lumpur, Malaysia, [13]The University of Edinburgh, United Kingdom

Research question

What should be included in a web-based asthma resource toolkit to facilitate implementation of evidence-based asthma care among healthcare providers at primary care clinics?

Background
Heavy clinic load presents a huge challenge for the implementation of evidence-based asthma care in primary care clinics that may result in suboptimal asthma care delivery. This study aims to develop a web-based asthma care resource (Klang Asthma Cohort - KAC Kit) to facilitate primary healthcare providers manage asthma more efficiently and effectively.

Methodology
The KAC Kit development involved content and website structure design. A group of asthma care experts and primary healthcare providers reviewed and compiled evidence-based asthma care resources for primary healthcare providers and designed the presentation of the content. The study team who excels in digital health technology organised the web-site content in a practical and user-friendly manner.

Results
Four sections of the website were developed (1) overview of asthma in primary care and quality improvement strategies (2) clinical management of asthma (3) targeted asthma education and (4) supporting tools for routine asthma care. The content is presented through short articles, simplified diagrams, infographics, and videos. All graphics were created using Canva while videos were created using Vyond software. Both software applications are cloud-based which allowed collaborative work between creators.

Expected Impact
KAC Kit has the potential to facilitate the integration of evidence-based asthma care into primary care practice resulting in improved quality of care and patient outcomes, and reduced healthcare costs.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/klang-asthma-registry

24 Challenges in developing an asthma registry for primary care practice in Malaysia

Rizawati Ramli[1], Hooi Chin Beh[2], Norita Hussein[1], Siti Nurkamilla Ramdzan[1], Adina Abdullah[1], Nik Sherina Hanafi , Chin Hai Teo[1,3], Ping Yein Lee[3], Hirahara Norimichi[3], Ai Theng Cheong[4], Hani Syahida Salim[4], Sazlina Shariff Ghazali[4,5], Azainorsuzila Mohd Ahad[6], Zienna Zufida Zainol Rashid[7], Siti Fairuz Asahar[8], Yong Kek Pang[9], Chee Kuan Wong[9], Asiah Kassim[10], Ahmad Tajuddin Mohamad Nor[11], Karuthan Chinna[12], Ee Ming Khoo[1], Jurgen Schwarze[13], Hilary Pinnock[13]
[1]Department of Primary Care Medicine, Universiti Malaya, Malaysia, [2]Department of Primary Care Medicine, Universiti Malaya Medical Centre, Malaysia, [3]UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Malaysia, [4]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [5]Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia, [6]Port Dickson Health Clinic, Port Dickson, Malaysia, [7]Pandamaran Health Clinic, Klang, Malaysia, [8]Bukit Kuda Health Clinic, Klang, Malaysia, [9]Department of Medicine, Universiti Malaya, Malaysia, [10]Department of Medical Peadiatric, Clinical Research Centre, Hospital Tunku Azizah, Kuala Lumpur, Malaysia [11]Emergency and Trauma Department, Hospital Tengku Ampuan Rahimah, Klang, Malaysia, [12]UCSI University Kuala Lumpur, Malaysia, [13]The University of Edinburgh, United Kingdom

Research question
What are the challenges in developing an asthma registry for primary care clinics?

Background
In Malaysian primary care, evaluation and monitoring of asthma care have been limited by poor documentation and absence of an organised database that collects and stores relevant clinical information. We developed the Klang asthma cohort (KAC) registry to support efficient and standardised data entry, data storage and retrieval for effective monitoring of asthma care performance indicators in primary care clinics.

Methodology
The development phase of the registry involved designing the dataset based on evidence of quality asthma care indicators and designing the operating system to support data transfer between electronic medical record system (EMR: Teleprimary Care and Oral Health Clinical Information System (TPC OHCIS)) and the research database.

Results
The finalised registry consists of 25 data elements encompassing patients' demography, asthma control, asthma treatment, asthma education and continuity of care. An MS Excel spreadsheet is used as the registry template and the Universiti Malaya Data Intensive Computing Centre (DICC) cloud service is used for data storage to ensure data security. The main challenge encountered was establishing interoperability between the clinic EMR system and the registry. Automating the process of transferring patient data from the clinic EMR into the registry was highly technical and costly for a small-scale feasibility study. Unfortunately, this process does not align with the Ministry of Health (MOH) policy resulting the inability to adopt.

Expected impact
A properly designed and implemented asthma registry is important to provide a true picture of asthma management and patient outcomes in primary care clinics. However, the poor interoperability of the EMR system may hinder the implementation's success and long-term sustainability.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/klang-asthma-registry

25 Evaluating a school-based asthma training programme for primary school staff: a pilot cluster-randomised controlled trial

Dr Siti Nurkamilla Ramdzan[1], Nursyuhada Sukri[1], Norita Hussein[1], Christine Shamala Selvaraj[1], Rizawati Ramli[1], Nik Sherina Hanafi[1], Ping Yein Lee[2], Adina Abdullah[1], Jayakayatri Jeevajothi Nathan[1], Ai Theng Cheong[3], Sazlina Shariff Ghazali[3,4], Hani Salim[3], Ho Bee Kiau[5], Salbiah Mohamed Isa[5], Asiah Kassim[6], Chee Kuan Wong[7], Yong Kek Pang[7], Azainorsuzila Ahad[8], Ahmad Tajuddin Mohamad Nor[9], Ee Ming Khoo[1], Karuthan Chinna[10], Jürgen Schwarze[11], Hilary Pinnock[11]
[1]Department of Primary Care Medicine, Faculty of Medicine, Universiti Malaya, Malaysia, [2]UM eHealth Unit, Faculty of Medicine, Universiti Malaya, Malaysia, [3]Department of Family Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Malaysia, [4]Malaysian Research Institute on Ageing, Universiti Putra Malaysia, Malaysia, [5]Botanic Health Clinic, Klang District, Ministry of Health Malaysia, [6]Department of Pediatric and Clinical Research Centre, Hospital Tunku Azizah, Hospital Kuala Lumpur, Malaysia, [7]Department of Medicine, Faculty of Medicine, Universiti Malaya, Malaysia, [8]Port Dickson Health Clinic, Port Dickson, Malaysia, [9]Emergency and Trauma Department, Hospital Tengku Ampuan Rahimah, Klang, Malaysia, [10]UCSI University Kuala Lumpur, Malaysia, [11]The University of Edinburgh, United Kingdom

Background
The World Health Organization recommends providing school staff with first-aid asthma training to support the care of children with asthma in all settings. Malaysia has no existing programme, so we have developed a training programme for school staff to provide timely and appropriate care for children with asthma in schools. The study aims to estimate the effectiveness of the programme.

Methodology
This is a pilot cluster-randomised controlled trial involving school staff in government primary schools in the Klang District, Malaysia. Two schools were randomised to receive the intervention, and another two to receive general health education. We trained the Klang school health team and delivered the school-based asthma programme together. For the primary outcome, we will assess the knowledge of school staff using a validated questionnaire at baseline, 1-, 3-, 6-, and 12-month post-intervention. The feasibility of implementing the programme will be assessed as a secondary outcome.

Challenges
Seven of 23 eligible schools agreed to participate. Due to limited resources, agreed schools were randomised to only include two schools in each group: intervention and control. We implemented the intervention in one school and the control programme in another. In general, we received favourable feedback from the school staff in the intervention group; however, some school staff in the control group were dissatisfied with receiving general health education. Delivery in two schools, one from each group, was hindered by scheduling conflicts. We are currently engaged in ongoing discussions to secure dates for delivering the programmes at these schools.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/react-schools

26 Enhancing Chronic Respiratory Disease Management in Rural India: Evaluating the Feasibility of Spirometry Integration in Primary Care

Radhika Nimkar[1], Anand Kawade[1], Hilary Pinnock[2], Dhiraj Agarwal[1]
[1]Vadu Rural Health Program, KEM Hospital Research Centre, Pune, [2]Usher Institute, The University of Edinburgh, Edinburgh

Background
Chronic respiratory diseases (CRD) account for 11% of NCD-related mortality in India. Despite spirometry being the gold standard for diagnosing asthma and COPD, shortage of skilled personnel in primary care hinders timely management. RESPIRE research highlights knowledge gaps and challenges among general practitioners (GPs) in managing these conditions, emphasizing the need for better training and diagnostic tools. NP-NCD revised guidelines (2023-2030) propose CRD screening at the primary healthcare level but lack clarity on capacity building for spirometry use. The study aims to assess the feasibility and acceptability of integrating spirometry into routine primary care practice.

Research question
What is the feasibility and acceptability of integrating spirometry into the routine practice of primary care physicians in rural India for the effective diagnosis and management of CRD?

Objective
To assess the feasibility and acceptability of integrating spirometry among primary care physicians in rural India for the effective diagnosis and management of CRD.

Methodology
This mixed-methods, pre-post intervention study will be conducted at the Community Health Research Unit (KEMHRC) in Pune district. The study population includes primary care physicians (GPs), Auxiliary Nurse Midwives (ANMs), and Accredited Social Health Activists (ASHAs). Baseline data from In-depth interviews (IDI) will assess the Knowledge, Attitude, and Practices (KAP) in CRD management and spirometry use. Pulmonologist-led interventions will provide capacity building and hands-on training. Six months post-intervention, IDI of 20 participants will evaluate changes in KAP, exploring facilitators and barriers to incorporating spirometry into clinical practice.

Challenges
Inadequate infrastructure in primary care centers to support routine spirometry use.

Expected Impact
Early, accurate diagnosis of CRDs will enable timely, appropriate management, reducing morbidity and mortality.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/4ccord-quality-improvement-upskilling

27 Pulmonary Rehabilitation for Chronic Respiratory Diseases: Views of Healthcare Professionals and Policymakers in Bangladesh

Ajay K Roy[1], Monsur Habib[1,2,3], Nazim Uzzaman[1,2,3], Rowshan Alam[1], Sadia Sultana[2], Kmarun Nahar[1], Ataul Gani[1], B D Bidhu[1], Hilary Pinnock[3]
[1]Bangladesh Primary Care Respiratory Society, [2]Bangladesh Lung Foundation, [3]Usher Institute, University of Edinburgh, UK

Background
Chronic respiratory diseases (CRDs) significantly burden global health, causing widespread morbidity and mortality. Despite their impact, CRDs are rarely prioritised in healthcare agendas in low- and middle-income countries (LMICs) like Bangladesh. Pulmonary rehabilitation (PR) is crucial for managing CRDs, combining exercise training, education, and psychosocial support to address the physical, functional, and emotional challenges of CRDs. Despite guidelines recommending, PR remains underutilised in LMICs.

Research questions

1. Are healthcare professionals and policymakers confident on effectiveness and safety of PR?
2. What are their views on the practicality, acceptability, and organisational framework of current PR services?
3. What recommendations and insights do they offer for promotion and implementation of PR in Bangladesh?

Rationale

Previously, we organised stakeholder events in Bangladesh, identifying key challenges in implementing PR services. Most stakeholders were already supportive of PR. We now aim to understand the perspectives of healthcare professionals, particularly pulmonologists and primary care practitioners, and explore views of influential stakeholders who might hinder PR implementation.

Method

We will conduct up to 20 interviews with healthcare professionals and 20 with policymakers from public and private health sectors using snowball and purposive sampling. We consider 40 interviews sufficient for diversity within the study's timeline and resources. Recruitment will stop upon achieving data saturation, but we may conduct up to five more interviews to clarify key themes.

Result

We have obtained approval from ACCORD and the local IRB to date. So far, we have conducted 20 interviews, facing challenges of time constraints and participants' unpreparedness. We are currently transcribing the interviews and coding them concurrently, while also modifying the topic guide accordingly.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/pr-qualitative

28 Co-designing a multi-national trial in low- and middle-income countries (LMICs): the story of the PuRe trial

Pinnock H[1], Habib M[2], Agarwal D[3], Engkasan J[4], Paul B[5], Hammersley V[1], Rabinovich R[6], and the teams from BPCRS, CMC, KEM, UM and UoE.

[1]Usher Institute, The University of Edinburgh, UK, [2]Community Respiratory Clinic, Bangladesh Primary Care Respiratory Society, Khulna, Bangladesh, [3]Vadu Rural Health Program, King Edward Memorial Hospital Research Centre, Pune, India, [4]Department of Rehabilitation Medicine, Universiti Malaya, Kuala Lumpur, Malaysia, [5]Rural Unit for Health and Social Affairs, Christian Medical College, Vellore, India, [6]NHS Borders

Background

Co-designing research with local stakeholders improves relevance of findings and is especially pertinent to developing and evaluating complex interventions in LMICs when technical expertise may lie with colleagues in high-income countries but the experience and local knowledge is embedded in the low-resource setting. Emerging from RESPIRE, our experience of designing the PuRe trial illustrates some key considerations.

Approach, challenges and opportunities

The PuRe trial is testing pulmonary rehabilitation for people with chronic respiratory disease in four diverse settings in Bangladesh, India and Malaysia.

- Community engagement work conducted in the four centres, ensured the research question reflected the local contexts and healthcare needs, optimising the relevance of the research to end-users.
- The academic research gap was identified by systematic reviews undertaken by the local teams.
- Feasibility studies in the four centres explored a range of approaches to delivering pulmonary rehabilitation and confirmed practicability, acceptability and potential utility in the proposed settings.
- The core components of pulmonary rehabilitation, systematically adapted from global guidelines by local colleagues, are being defined for the trial in a detailed manual.
- On-going discussions allow/encourage adaptations that will enable delivery in the diverse settings.
- A robust process evaluation will be needed to monitor fidelity and record local adaptations.
- Capacity building is embedded throughout the preliminary work and trial delivery.

Progress
Following UK ethical approval, local ethical applications have been submitted. On-line training will be followed by a face-to-face workshop in Khulna in October. We hope to recruit our first participants before the end of the year.

29 Using photovoice to understand the experiences of people living with chronic respiratory disease (CRD): reflections of its conduct across various settings

Hani Salim1, Nik Sherina Hanafi2, Ee Ming Khoo2, Dipali Dhamdhere3, Uddhavi Kand3, Dhiraj Agarwal3, Rutuja Patil3, Sangeetha Rathnam4, Rachel Immanuel4, Paul Jebaraj4, Sharon Jose4, Biswajit Paul4, Ashish Satav5, Dhananjay Raje5, Vibhawari Dani5, Niteen Wairagkar5, Radha Munje5, Milind Sovani5, Dipti Jain5, Sanjay Zodpey5, Abhishek Madura5, Mansi Shelgaonkar5, Shilpa Satao5, Rita Isaac6, David Weller7, Hilary Pinnock7

[1]Universiti Putra Malaysia, Malaysia; [2]Universiti Malaya, Malaysia; [3]KEM Hospital Research Centre, Pune; [4]Christian Medical College, Vellore, India; [5]MAHAN Trust, India; [6]Karkinos Foundation; [7]Usher Institute, University of Edinburgh

Background
Photovoice is an arts-based qualitative method that captures subjective experiences through photographs and narratives.

Objective
We aimed to describe the challenges and opportunities in conducting photovoice with people with chronic respiratory diseases (CRDs) in India and Malaysia.

Methods
We adapted photovoice methodology to six diverse settings, enabling the conduct of initial qualitative interviews, training and photo-taking activity using a smartphone. One-to-one photo interviews with the subset of participants who successfully took photos. Interviews were audio-recorded, transcribed, and analysed. The projects are on-going in four of the settings.

Challenges
Maintaining participant motivation is challenging for all study stages and requires proactive follow-up. Participants with moderate to severe CRD symptoms face difficulties completing the study stages. Older participants and those with poor digital literacy need extra support, often relying on family members for smartphone use. Lack of access to electricity and difficult terrain complicate participation in tribal communities. Poverty, illiteracy, work priorities, and cultural practices reduce participant commitment and quality of contribution. For example, stigma surrounding phone usage for taking photographs among women living in villages can impede engagement.

Opportunities
Effective engagement with communities and their families (such as through village visits and involving family members of elderly participants) enhanced participation, ensured retention and promoted culturally sensitive research practices. Photovoice training provided with contextually adapted manuals that resulted in good quality and meaningful photos. Access to at least one smartphone per household in most settings ensured success in the photo-taking task. Photo-taking and accompanying discussions empowered participants to highlight issues that mattered to them.

Conclusion
Despite its challenges, photovoice proves to be a transformative method, empowering individuals and amplifying the voices of people living with CRD in India and Malaysia to drive awareness and potentially drive change in the community.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/4ccord-photovoice

30 Understanding the views and experiences of people living with chronic respiratory disease (CRD) in India: Insights from an adapted photovoice study

Uddhavi Kand[1], Dipali Dhamdhere[1], Dhiraj Agarwal[1,3], Hani Salim[2,3], Hillary Pinnock[3], Rutuja Patil[1,3] and RESPIRE collaboration

[1]Vadu Rural Health Program, KEM Hospital Research Centre, Pune, India, [2]Universiti Malaya, Malaysia, [3]NIHR Global Health Research Unit on Respiratory Health (RESPIRE), University of Edinburgh

Background

Chronic respiratory diseases (CRD) substantially impact health and quality of life, awareness about them remains low, and the social and healthcare burdens are inadequately understood. In this abstract we present the findings from the initial interview to understand the experiences of individuals living with CRD, aiming to inform holistic care approaches in Indian Settings.

Objectives

To explore the knowledge, perceptions, social and cultural environment of patients of CRDs through Photovoice and its influence on policymakers.

Methods

As a part of the Photovoice study, we have conducted initial text interviews and have analysed data from 5 interviews using a rapid analysis approach. We plan to recruit 30 participants for this study.

Results

The data analysis is done using the following domains:

- Knowledge: Participants' knowledge of CRD varied significantly. Some had a good understanding of their condition including the causes, symptoms, and management strategies, while some were less informed. Common misconceptions included beliefs that CRD symptoms were a normal part of ageing.
- Perception: Participants viewed CRD as a manageable chronic condition, while others saw it as an illness that severely restricted their lives.
- Impact on Daily Life: CRD had a major impact on daily life, restricting physical activity, social interactions, and work opportunities. Participants often felt fatigued and unable to participate in activities they earlier participated in, which provided them with a sense of isolation.
- Economic and Social Factors: Socio-economic status influenced access to healthcare, affordability of treatment, and overall quality of life. Participants from lower socio-economic backgrounds reported challenges in managing their condition due to financial constraints and lack of access to quality healthcare.
- Coping Mechanisms: Participants used various coping mechanisms, including practicing traditional exercises (Yoga), maintaining a healthy diet, and engaging in light physical activities. They also avoided exposure to factors like exposure to dust, and pollen grains which can worsen their condition.

https://www.ed.ac.uk/usher/respire/research/non-communicable-diseases/current/4ccord-photovoice

NIHR Global Health Research Unit on Respiratory Health (RESPIRE)

RESPIRE aims to reduce the number of deaths and wider health and societal impacts from respiratory diseases in some of the world's most disadvantaged populations.

Co-led by the University of Edinburgh and Universiti Malaya, RESPIRE partners based in Bangladesh, Bhutan, India, Indonesia, Malaysia, Pakistan, and Sri Lanka collaborate to deliver low-cost, scalable policy and clinical interventions to reduce respiratory disease and death in Asia.

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