

## Allergy training in India

India is the second most populous country in the world with approximately 1.35 billion people and is the home to nearly a quarter of the world's inhabitants.<sup>1,2</sup> Nearly 20%–30% of Indian citizens suffer from at least one form of allergy.<sup>2</sup> An estimated 300 million people worldwide have asthma, of these, 37.9 million people live in India alone.<sup>2</sup> The burden of asthma cases exceeds the number of people with HIV infection or tuberculosis in India.<sup>2</sup> Moreover, the prevalence of allergic rhinitis has also risen steadily over the last two decades. Although lower in prevalence in high-income countries, those with suspected food allergies have exhibited greater degrees of sensitization with the changing food habits in recent times.<sup>3</sup>

The specialty of allergy remains poorly understood in several parts of the world, especially in the lower-to-middle income countries. The disease burden has risen disproportionately compared to the availability of skilled manpower available in India and most of its neighbouring countries. Among the several challenges, delay in recognition of patient's symptoms, lack of awareness of atopic march progression, over-emphasis on serum allergy testing, pharma driven therapeutic approaches and lack of universal allergy practices are notable. Producing potent antigens for the skin testing and treatment of allergy in India remains a significant challenge. The allergen extracts of *D. pteronyssinus* and *D. farinae* manufactured in 2018 in India were significantly less potent compared with FDA approved allergen extracts made in the USA.<sup>4</sup> India has the lowest score for asthma control, according to Dr Salvi. et al.<sup>5</sup> reporting in the Asia Pacific Asthma Insights and Management (AP-AIM). This study has clearly highlighted the fact that asthma management in India remains very poor.

Addressing educational gaps in the field of allergy is crucial in addressing the deficiencies in the delivery of care. The curriculum at the medical schools in India inadequately covers topics related to allergy and immunology. Barker and colleagues have recently highlighted salient problems in imparting allergy education and training in different parts of the world.<sup>6</sup> Therefore, instituting better and more effective educational initiatives for healthcare professionals at various levels is essential. Apart from the fact that the undergraduate curriculum does not do justice to the teaching of allergy, the absence of allergy skin-testing facilities and lung-function laboratories in most of the medical institutions across India, seriously undermines the learning opportunities for both undergraduate and post-graduate medical students. There are no existing postgraduate degree program in allergy recognized by the National medical council, although the curriculum is written up in detail and the description of the course is available on the website of the National Medical Council of India.<sup>7</sup> It is also mentioned in the Gazette of India

in the year 2000 at the website of the erstwhile Medical council of India.<sup>8</sup> To mitigate these deficiencies, over the past several years, professional organizations such as the Indian College of Allergy and Applied Immunology (ICAAI) and Indian Academy of Allergy (IAA) have been offering continued medical educational (CME) seminars, webinars, and workshops. Notably, a hybrid program with distance-learning and contact sessions, 'Diploma Allergy Asthma (DAA)' was established in 2006 at the Christian Medical College, Vellore, Tamil Nādu, India, in collaboration with the International Asthma Services, a medical educational charity organization based in Colorado, USA ([www.globalchestinitiatives.org](http://www.globalchestinitiatives.org)). The program runs over one calendar year and includes four weeklong personal contact sessions, one every quarter. The program admits practicing Paediatricians, Otorhinolaryngologists, General and Respiratory Physicians. Capitalizing on their knowledge of the foundational principles, and the practical experience in their specialties, the program focusses on building up conceptual and practical skills in the field of Allergy and Immunology. The program is extremely popular and attracts specialists from all over India and the neighbouring countries. Some of the DAA alumni have in the past few years set up similar programs in Delhi, Bangalore, and Kolkata, India. The DAA program or any other similar program promoted by International Asthma Services (IAS) in India have no commercial support from any source. The programs are all self-funded through the tuition fees collected. The core faculty as well as the directors of the course are not compensated for their services. In fact, the program reimburses the supporting organization for providing space, infrastructure, and secretarial help. Hence this independent approach of our programs gives a significant lee way for the promoters in the selection of the faculty, selection of the students as well as the curriculum and overall autonomous operation of the program. All these courses have been endorsed by international bodies such as the American Academy of Allergy, Asthma, and Immunology (AAAAI) and the Center for Global Health, University of Colorado, Denver, USA. The standards based upon the quality of the course content, assignments, clinical and journal club discussions as well as the theory and practical examinations are in par with the international levels. This is based upon the input from the international faculty as well as foreign examiners who have been trained overseas. Currently, nearly 1000 physicians have graduated from these programs and are practicing in various locales in India and beyond. Around 30% of the alumni are practicing in corporate hospitals across the country and are located in 25/28 states (exceptions: Nagaland, Tripura, Manipur) of the Indian union. Around 30% of the graduates are administering allergen Immunotherapy and an unpublished survey done in 2018 only among the DAA graduates with 28%

response rate revealed 85% improvement in overall Allergy Asthma diagnostic skills, 66% improvement in disease management skills and 95% in achieving the set goals.

When the DAA program commenced in Vellore, it became clear that there was no comprehensive textbook covering the practical aspects of Allergy relevant to routine clinical care. A group of Indian and International Allergists contributed to the publication of a textbook namely, the 'Textbook of Allergy for the Clinician' published in 2014 and revised in 2021 by the CRC Press (Taylor & Francis).<sup>9</sup> The professional societies have a key role in physician education. The Indian Academy of Paediatrics (<https://www.iapindia.org>), a national professional organization serving paediatricians, with nearly 33,000 members, has set up a specialty chapter covering allergy and applied immunology. Such initiatives of the other National societies serving the respiratory and general physicians would go a long way in educating their members and thus improve the care of allergy patients in India.

The evaluation of the pertinent issues related to the state of Allergy education could be summarized in the following as a SWOT analysis:

- Strengths: Unique, in demand, effective, motivated, name brand, highly applicable
- Weakness: No Government recognition, lacks credibility, not transferable, lacks full time faculty
- Opportunities: Huge patient load, academic and research opportunities, high remuneration
- Threats: Not legally binding, insecurity, lack of sustainability, no reciprocity

Ultimately, the greatest impact would be in the introduction of changes to the formal medical education. There should be revamp

of the curriculum to cover the basics of Allergy and Immunology. A comprehensive formal 2-year postgraduate super specialty training for the general physicians, paediatricians and respiratory physicians would be the ideal option. A 2-year post-doctoral fellowship program for the same group may be a reasonable compromise. In any case unless these courses are approved by the National Medical Council, they would not have full credibility and there may not be many takers.

Education of the physician alone may not be sufficient to create the required transformation in allergy care. We, therefore, propose a multi-modal approach (Figure 1), in sync with Barker et al,<sup>6</sup> to include: medical students, physicians, nurses, paramedical personnel, as well as the community members.

The scope of training to be administered for medical personnel at the undergraduate, specialty training and super-specialty training is outlined in Table 1. Establishing a few centres of excellence in India to provide patient care, training perform high quality research and take on an advocacy role for the field of allergy remains the ultimate goal.

At this juncture it should be mentioned that there are programs offered in the field of allergy for training both clinicians as well as researchers. One such a very well-defined on-line as well as Hybrid courses (M.Sc. In Allergy /PG Diploma/PG Certificate) mentored by world renowned allergists and immunologists from the Imperial College, London U.K. will be offered in the later part of 2022. The curriculum is very well oriented and serves the purpose of clinicians as well as researchers. The fee structure mentioned are equivalent to USD 20000-USD 45000 for the full course. Obviously, these training opportunities are 'more expensive' than the 'local and national' courses like DAA offered at fees around USD 2000/ full course in India. Regular webinars and CME are offered at subsidized

	Physicians		Paramedical	Community	
<b>Cohort</b>	Trainee (Under-/Post-Graduation/ Super-specialty)	Practitioners (Conventional and Alternative medicine)	Nurses, Technicians, Pharmaceuticals and support staff	Parents/ Guardians/ Patients	Non-medical educational institutes
<b>Type of Training</b>	In-house training (Table 1)	Contact session based programs	Skill enhancement (Diagnostics & Therapeutics)	Support groups	Awareness campaign
<b>Tools</b>	Physical/Hands on sessions	Virtual/Physical/Hands on sessions		Physical/Media (Print or audio-visual)	
<b>Updates</b>	Continuing Medical Education (CME)/Workshops/Conferences			Awareness/Educational camps	
<b>Quality control</b>	Standardization, Periodic audit and evaluation, Action modification, Re-evaluation			Feedback, Improvisation	
<b>Recognition</b>	Accreditation by state/center medical regulatory societies/bodies			Legislative/local authorities	
<b>Participation</b>	Inter-sectoral coordination of Public-Private, Physician-Patient, Support groups, volunteers, Non-profit organizations and Information Technology				
<b>Goals</b>	To improve allergy diagnostics, therapeutics, awareness and research at affordable cost				

FIGURE 1 Allergy training plan in India - Multi-modal approach

TABLE 1 Grades of competency in allergy education

Competency levels	Beginner	Intermediate	Advanced
Goals	<ul style="list-style-type: none"> <li>• Emergency treatment</li> <li>• Recognize common conditions</li> <li>• Screen and refer</li> <li>• Patient education</li> <li>• Primary prevention</li> </ul>	<ul style="list-style-type: none"> <li>• Manage common ailments and their complications</li> <li>• Interpret common diagnostics</li> <li>• Provide routine pharmacotherapy and allergen immunotherapy</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to manage high risk patients</li> <li>• Provide quality referral services</li> <li>• Advanced diagnostics (viz. challenge tests) and therapeutics (viz. biologicals)</li> <li>• Knowledge dissemination by teaching and training</li> </ul>
Eligibility	<ul style="list-style-type: none"> <li>• Undergraduates</li> </ul>	<ul style="list-style-type: none"> <li>• Post-graduates</li> </ul>	<ul style="list-style-type: none"> <li>• Specialty level</li> </ul>
Type of training	<ul style="list-style-type: none"> <li>• Classroom teaching</li> </ul>	<ul style="list-style-type: none"> <li>• Rotatory postings</li> </ul>	<ul style="list-style-type: none"> <li>• Regular In-house training</li> </ul>
Schedule	<ul style="list-style-type: none"> <li>• Theory sessions</li> </ul>	<ul style="list-style-type: none"> <li>• Theory sessions</li> <li>• Hands on practical skill learning</li> <li>• Bed side teaching</li> </ul>	<ul style="list-style-type: none"> <li>• Theory sessions</li> <li>• Hands on practical skill learning</li> <li>• Journal club presentation</li> <li>• Thesis writing</li> <li>• Research activity</li> <li>• Periodic evaluation and exit exam</li> </ul>

prices or even free of cost to members from LMIC by EAACI, WAO, APACCI, AAAAI. These serve as additional sources of knowledge for students and alumni of DAA and similar programs offered. Shorter training programs with personal contact sessions could enhance the skills and expertise of practicing physicians, paramedical personnel, and nurses from urban, semi-urban, and rural locations.

With the implementation of the necessary changes in medical education and broad-based multi-modal approaches that target both professionals and community members alike, the standard of care of Allergic patients could improve substantially. This is the way forward for India.

#### ACKNOWLEDGEMENT

The authors are hereby acknowledging Ms. Ranjani Vedanthan for manuscript editing.

#### CONFLICT OF INTEREST

The authors (PKV, DJC, NG) have no conflict of interest to declare.

#### AUTHOR CONTRIBUTION

PKV authored the main content of the article. DJC reviewed and added additional concepts. NG reviewed the article and made up the table and figure. All the authors have fully reviewed the article in full and agree with the contents.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Pudupakkam K. Vedanthan<sup>1</sup>  
Devasahayam Jesudas Christopher<sup>2</sup>  
Neeraj Gupta<sup>3</sup>

<sup>1</sup>University of Colorado, Denver, Colorado, USA

<sup>2</sup>Christian Medical College-Hospital, Vellore, India

<sup>3</sup>Sir Ganga Ram Hospital, Delhi, India

#### Correspondence

Pudupakkam K Vedanthan, University of Colorado, Denver, Colorado 80204, USA.

Email: [pkv1947@gmail.com](mailto:pkv1947@gmail.com)

#### REFERENCES

1. Krishna TK, Mahesh PA, Vedanthan PK, Moitra S, Mehta V, Christopher DJ. An appraisal of allergic disorders in India and an urgent call for action. *World Allergy Organ J.* 2020;13:100446.
2. Krishna TK, Mahesh PA, Vedanthan P, Mehta V, Moitra S, Christopher DJ. The burden of allergic diseases in Indian subcontinent. *Lancet Glob Health.* 2020;8:e478-e479.
3. Li J, Ogorodova LM, Mahesh PA, Yaadan Akash M, Burney PGJ, Wong GWK. Comparative study of food allergies in children from China, India, and Russia: EuroPrevall-INCO surveys. *J Allergy Clin Immunol Pract.* 2020;8(4):1349-1358.
4. Christopher DJ, Ashok N, Ravi Varma A, et al. Low Potency of Indian dust mite allergen skin prick test extracts compared to FDA-approved extracts: a double-blinded randomized control trial. *Allergy Rhinol.* 2018;9. doi:10.1177/2152656718796746
5. Salvi SS, Apte KK, Dhar R, Shetty P, FuruqiRA TPJ, Guleria R. Asthma insights and management in India: lessons learnt from the Asia Pacific - Asthma Insights and Management (AP-AIM) study. *J Assoc Phys India.* 2015;63(9):36-43.
6. Barker S, Daniels L, Chang YS, et al. Allergy education and training for physicians. *World Allergy Organ J.* 2021;14(10):100589.
7. <https://www.nmc.org.in/wp-content/uploads/2019/09/Dipoma-in-Allergy-Clinical-Immunology.pdf>. Accessed May 15, 2022.
8. <https://www.nmc.org.in/wp-content/uploads/2019/12/Postgraduate-Medical-Education-Regulations-2000.pdf>. Accessed May 15, 2022.
9. Greenhawt M. Book review. *Ann Allergy.* 2022;128(1):114.