Allergy in Hong Kong: an unmet need in service provision and training

YT Chan, HK Ho, Christopher KW Lai, CS Lau, YL Lau, TH Lee *, TF Leung, Gary WK Wong, YY Wu; for The Hong Kong Allergy Alliance

A B S T R A C T

Many children in Hong Kong have allergic diseases and epidemiological data support a rising trend. Only a minority of children will grow out of their allergic diseases, so the heavy clinical burden will persist into adulthood. In an otherwise high-quality health care landscape in Hong Kong, allergy services and training are a seriously unmet need. There is one allergy specialist for 1.5 million people, which is low not only compared with international figures, but also compared with most other specialties in Hong Kong. The ratio of paediatric and adult allergists per person is around 1:460 000 and 1:2.8 million, respectively, so there is a severe lack of adult allergists, while the paediatric allergists only spend a fraction of their time working with allergy. There are no allergists and no dedicated allergy services in adult medicine in public hospitals. Laboratory support for allergy and immunology is not comprehensive and there is only one laboratory in the public sector supervised by accredited immunologists. These findings clearly have profound implications for the profession and the community of Hong Kong and should be remedied without delay. Key recommendations are proposed that could help bridge the gaps, including the creation of two new pilot allergy centres in a hub-and-spoke model in the public sector. This could require recruitment of specialists from overseas to develop the process if there are no accredited allergy specialists in Hong Kong who could fulfil this role.

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[1] **YT Chan,** MB, BS, FHKAM (Pathology)
[2] **HK Ho,** MB, BS, FHKAM (Paediatrics)
[3] **CKW Lai,** DM, FRCP
[4] **CS Lau,** FRCP, FHKAM (Medicine)
[2] **YL Lau,** MD, FHKAM (Paediatrics)
[5] **TH Lee *,** ScD, FRCP
[6] **TF Leung,** MD, FRCPCH
[6] **GWK Wong,** MD, FRCPC
[3] **YY Wu,** MB, ChB, DABA&I

[1] *Division of Clinical Immunology, Department of Pathology and Clinical Biochemistry, Queen Mary Hospital, Pokfulam, Hong Kong*
[2] *Department of Paediatrics and Adolescent Medicine, Queen Mary Hospital, The University of Hong Kong, Pokfulam, Hong Kong*
[3] *Private practice, Hong Kong*
[4] *Division of Rheumatology and Clinical Immunology, Department of Medicine, The University of Hong Kong, Pokfulam, Hong Kong*
[5] *Allergy Centre, Hong Kong Sanatorium and Hospital, Hong Kong*
[6] *Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong*

* Corresponding author: thlee@hksh.com

Introduction

There is a global epidemic of allergic diseases in the developed world and Hong Kong has not been spared. This review provides an overview of the epidemiology of allergic diseases in Hong Kong and matches it to the provision of local health care services as well as training in allergy.

How common are allergic diseases in Hong Kong?

The International Study of Asthma and Allergies in Childhood (ISAAC)[1-6] and other local studies[7-11] provide data on the prevalence and changing trends for some allergic diseases in Hong Kong. The ISAAC was a multi-country cross-sectional survey that provided a global epidemiological map of eczema, asthma, and rhinoconjunctivitis in 1995, 2000, and 2003. Children aged 6 to 7 years and 13 to 14 years were studied. The ISAAC Phase Three was a repetition of the ISAAC Phase One that aimed to evaluate the possible trend of disease prevalence after a period of 5 to 10 years.

In 2001, the prevalence of those who had ever been diagnosed with asthma in 6- to 7-year-olds was 7.9%. This reflected an increase of about 0.04% compared with 1995. In 2002 the prevalence of having asthma ever in 13- to 14-year-olds was 10.1%, representing a decrease in prevalence of 0.15% per year since 1995.

In 2001, the prevalence of lifetime eczema in 6- to 7-year-olds was 30.7% and current eczema was 4.6%. This reflected an increase in the current eczema prevalence of 0.12% per year since 1995. In 13- to 14-year-olds, the prevalence of lifetime eczema was 13.4% and that of current eczema was 3.3%. This reflected an increase of 0.08% per year since 1995.

In 2002, the rhinoconjunctivitis prevalence in

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香港的過敏性疾病：服務及培訓需求均未能滿足的一個範疇

陳育達、何學工、賴奇偉、劉澤星、劉宇隆、李德康、梁廷勳、黃永堅、鄔揚源；香港關注過敏病聯盟

香港不少兒童受過敏性疾病困擾，流行病學數據亦顯示過敏性疾病有上升的趨勢。此病往往會延續至成年，只有少數孩子在成長的過程中會逐漸自愈。縱然香港一向有優質的醫療服務，可是針對過敏性疾病的服務和培訓卻嚴重不足。本港過敏病科的專科醫生對人口比例為1比150萬人，這比例與外國甚至本港其他專科的數字比較都偏低。小兒過敏病科的專科醫生對人口比例為1比46萬人，而成人過敏病科的專科醫生對人口比例更為1比280萬人，醫生數量嚴重不足，而且小兒過敏病科的專科醫生只會花部分時間進行與過敏病症有關的工作。此外，公立醫院中並沒有過敏病科的專科醫生，亦沒有提供針對成人過敏病的服務。本港只有一個公營部門提供由認可的免疫學專科醫生監管的實驗室，顯然與過敏病和免疫學有關的實驗室服務不夠全面。這種情況對業界和香港社會會產生深遠的影響，應立即予以改善。本文建議在公營部門內設立兩個以軸輻運作方式的過敏病試驗中心。如果在開發的過程中未能在本港找到認可的過敏病科專科醫生，便可能有需要招聘外國專家去擔當這個角色。

13- to 14-year-olds was 22.6% and showed a decrease of 0.2% per year since 1995. Similar figure for 6- to 7-year-olds was 17.7% in 2001 and this represented an increase of 0.7% per year since 1995.

The Asthma Insights and Reality in Asia-Pacific Study was conducted twice in Asian countries, including mainland China, Hong Kong, Korea, Malaysia, The Philippines, Taiwan, and Vietnam, to gain insight into asthma management.[12] In the first survey of more than 3000 adults and children, more than 40% of asthmatic patients had at least one hospitalisation or visit to the emergency department for acute exacerbation. Inhaled corticosteroid use was reported by only 13.6% of the respondents. Another study performed 10 years after the first survey showed that less than 5% of patients achieved a level of complete asthma control, while more than one third were in the uncontrolled asthma category. Patients tended to overestimate their level of control and tolerated a high degree of impairment of their daily activities.[12-14] Most participants younger than 16 years had inadequately controlled asthma (53.4% 'uncontrolled' and 44.0% 'partly controlled'). The demand for urgent health care services (51.7%) and use of short-acting β-agonists (55.2%) were high.[15]

There are little epidemiological data on asthma and allergy in Hong Kong adults. In a review of data from local public hospitals in 2005, asthma ranked fourth and fifth highest as a cause of respiratory hospitalisations (5.7%) and respiratory inpatient bed-days (2.6%), respectively.[16] The overall crude hospitalisation rate for asthma in 2005 was 76/100 000, and was high at both extremes of age. The age-standardised mortality rate of asthma increased between 1997 (1.33/100 000) and 1998 (1.82/100 000), but decreased thereafter to 1.4/100 000 in 2005. The overall annual change in asthma mortality was not significantly different between 1997 and 2005. The prevalence of current wheeze increased from 7.5% in 1991/1992 to 12.1% in 2003/2004 among people older than 70 years; the corresponding figures for asthma were 5.1% and 5.8%.[17]

A number of studies have examined the prevalence of food allergies and adverse food reactions in a wide age range of Hong Kong children.[9-11,18] In 2009, parent-reported adverse reactions in 2- to 7-year-olds was 8.1%. A study involving children aged 7 to 10 years reported in 2010 that 'probable' food allergy in Hong Kong was 2.8%.[10] In 2012, the prevalence of food allergy in children from birth to 14 years was 4.8%, of which shellfish was by far the commonest food causing allergic symptoms, alongside egg, milk, peanuts, and fruits.[10]

Children with food allergies have 2 to 4 times higher rates of co-morbid conditions, including asthma, rhinoconjunctivitis, and eczema. Strikingly 700/100 000 of the population (15.6% of children with food allergies) aged 14 years or younger are estimated to be at risk for anaphylaxis, which is high relative to other countries. Almost 50% of cases are estimated to be caused by foods, with drug allergy also being a cause.[11]

Regarding other allergic diseases, Leung et al[19] reported glove-related symptoms in nearly one third of 1472 employees in a teaching hospital in Hong Kong. Most of these allergies could be classified as glove dermatitis, whereas only 3.3% had symptoms suggestive of latex allergy. About 7% of 133 participants had positive skin prick testing to one or more of the five latex extracts.

How does Hong Kong compare with the rest of the world in the number of allergy specialists?

There are only four immunology and allergy specialists (Medical Council Specialist Registration S34) in Hong Kong. Two of these clinicians, both of whom were trained abroad, are in private practice and the other two are not involved in allergy practice. There are no registered allergy specialists in adult medicine in public hospitals.

There are six specialists in Paediatric Immunology and Infectious Diseases (PIID; Medical Council Specialist Registration S56) of whom two work full time and four work part time, mainly in an allergy/immunology practice in the Hospital Authority (HA) hospitals/university sector. There is another PIID specialist working in private practice. Most of these clinicians only work part time on allergy.

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Many patients with allergic diseases in Hong Kong are treated by non-allergy specialists, such as general practitioners, or specialists in dermatology, respiratory medicine, ear nose and throat medicine, and paediatrics. While these excellent clinicians undoubtedly have experience in looking after patients with allergies, it is unclear how many have received formal training in managing complex multi-system allergies or whether their continuous professional development (CPD) activities include allergy.

If one assumes that PIID specialists spend on average 40% of their working week (5.5 days) on allergy, irrespective of whether they are full or part time (a generous estimate), then Hong Kong has 2 full-time equivalent (FTE) adult allergists and 2.8 FTE PIID specialists consulting for allergy. The overall ratio is therefore estimated to be around one allergist to 1.46 million population in Hong Kong, which is near the bottom of the world league table published by the World Allergy Organization (Table[20]).

There is a stark contrast in Hong Kong between the level of service provision for children and that for adults. The ratio of paediatric and adult allergists per head of population is around 1:460 000 (assuming there are about 1.3 million children in Hong Kong who are younger than 18 years) and 1:2.8 million (assuming there are about 5.7 million adults), respectively. There are no allergists for adult patients in public hospitals. The very low numbers of allergists (4.8 FTE) compares unfavourably with other specialties in Hong Kong, for example, there are 226 cardiologists, 164 gastroenterologists, 162 respiratory physicians, 190 otorhinolaryngologists, and 92 dermatologists. These data, combined with the average waiting times at public hospitals of 6 to 9 months for a new allergy appointment, clearly indicate that the demands for allergy services are unmet. The disease burden cannot be absorbed by the private sector as there are also very few private allergists.

Laboratory support is essential for the good practice of allergy and immunology. There are two Hong Kong Medical Council–registered immunologists (S44) who have also received some allergy training. One of them directs a public laboratory service in immunology and allergy as well as providing a limited service for drug allergy, while the other is not involved with allergy. Their budget does not allow a comprehensive menu of relevant tests to support the specialty.

In countries where there are more allergists per head of population than in Hong Kong, patients still consult non-allergy specialists instead of an allergist, even for a condition that often has an allergic cause such as rhinitis (Fig 1[20]).This suggests that there is a relative global lack of understanding

TABLE. Allergists per head of population[20]*

Country	Allergists per head of population
Argentina	1:46 353
Australia	1:140 000
Belgium	1:900 000
Brazil†	1:100 000
Bulgaria	1:106 250
Chile†	1:500 000
Colombia	1:571 428
Czech Republic	1:17 543
Denmark	1:135 000
Ecuador	1:2 400 000
El Salvador†	1:470 000
Finland	1:94 545
France	1:1 240 000
Germany	1:16 000
Greece	1:183 333
Hondurat†	1:1 380 000
Hungary	1:50 000
Israel	1:52 000
Italy	1:43 200
Japan	1:61 200
Lebanon	1:121 000
Malaysia	1:25 000 000
Mexico†	1:175 000
Mongolia	1:2 250 001
New Zealand	1:440 000
Paraguay†	1:200 000
Peru†	1:1 360 000
Philippines	1:66 115
Portugal	1:63 334
Romania	1:197 577
Serbia/Montenegro	1:500 000
South Africa	1:1 666 666
Spain†	1:44 000
Sweden	1:42 857
Switzerland	1:36 649
Thailand	1:1 000 000
Turkey	1:1 076 923
United Kingdom	1:1 083 333
Ukraine	1:94 441
Uruguay	1:110 000
United States (ACAAI)	1:65 546
Venezuela	1:109 090
Hong Kong	1:1 460 000

Abbreviation: ACAAI = American College of Allergy, Asthma and Immunology

* Data adapted from Reference 20, and permission granted by S Karger AG, Basel

† Figures from the Latin American Society of Allergy, Asthma and Immunology survey

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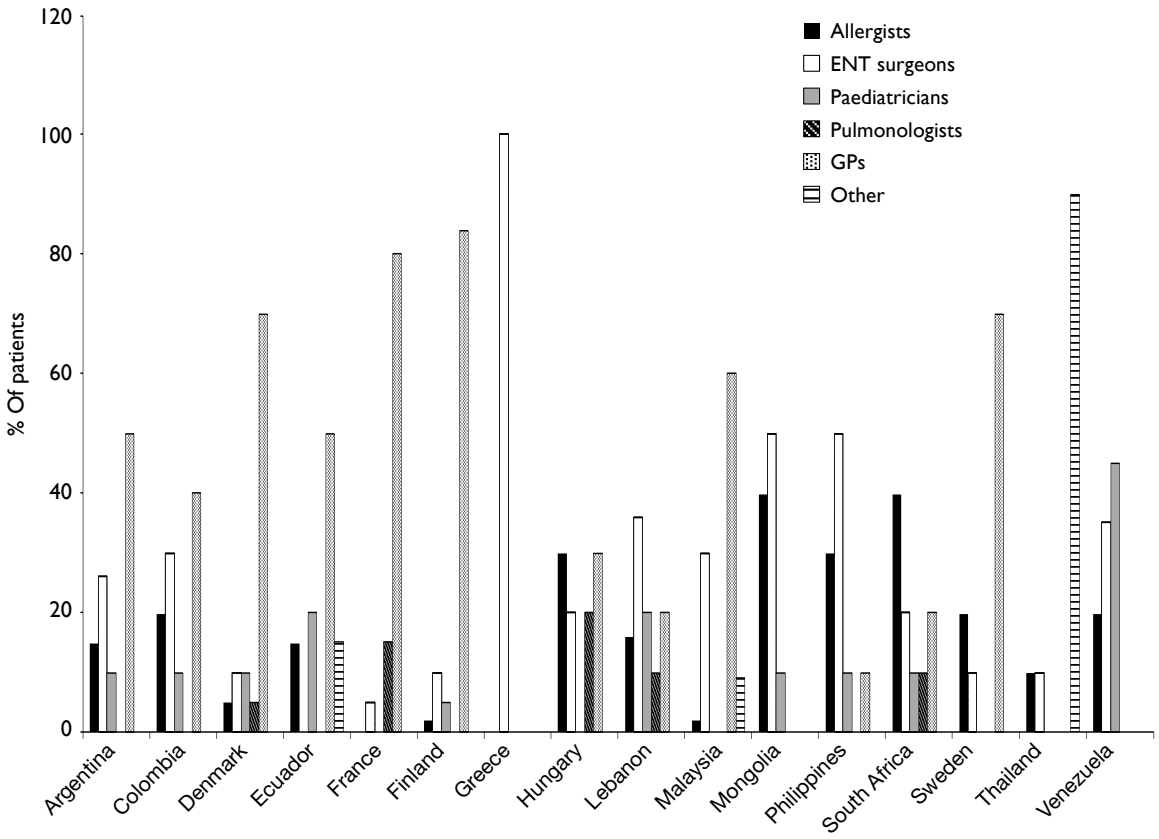

FIG 1. Who sees rhinitis patients?*
Abbreviations: ENT = ear, nose and throat; GP = general practitioner
* The % of patients seen by dermatologists remained at 0% for all countries; data adapted from Reference 20, and permission granted by S Karger AG, Basel

of what allergists can offer in health care. Clearly much needs to be done in public and professional education.

In the absence of allergists, patients may suffer because they may find it hard to get state-of-the-art medicine and diagnostics. Pharmaceutical companies are less likely to register their products in a country where the drugs will be prescribed only rarely. Furthermore, there is a high probability that unproven diagnostic procedures and therapies could be introduced if mainstream medicine is unavailable, or conventional tests are used inappropriately.[21] Finally, with a lack of allergy specialists, it becomes difficult to train future generation of clinicians, researchers, and teachers in allergy.

What is the provision of allergy services in public hospitals in Hong Kong?

Current situation for children

There are 12 acute paediatric units admitting children and adolescents for various acute exacerbations of diseases, including systemic allergic reactions and acute asthmatic attacks. The level of acute care is comprehensive and includes intensive care unit support when indicated. Data from the HA suggest that one in 10 patients with anaphylaxis attending acute emergency departments has been admitted to a paediatric intensive care unit.[22]

Ambulatory and out-patient follow-ups, however, are sometimes fragmented, especially for the prevention of anaphylaxis and investigation to identify allergens. Adrenaline auto-injector (eg EpiPen [Dey LP, Napa, California, US]) availability is very limited, although much improved recently, probably as the result of an audit report identifying the unmet need.[22]

Only four hospitals have designated allergy clinics to investigate food and drug allergy (Queen Mary Hospital [QMH], Prince of Wales Hospital [PWH], Princess Margaret Hospital [PMH], and Queen Elizabeth Hospital [QEH]). Some paediatricians with gastro-intestinal training look after patients with non-immunoglobulin E (IgE)–mediated food allergy with predominant gastro-

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intestinal symptoms.

Most of the paediatric units in Hong Kong have asthma clinics that are run by paediatricians with respiratory training. Care of patients with allergic rhinoconjunctivitis is largely provided by general paediatricians in conjunction with other organ specialists such as ear, nose and throat surgeons and ophthalmologists; there are long waiting times, ranging from 6 to 12 months.

Five hospitals have dermatology clinics (QMH, PWH, United Christian Hospital, Caritas Medical Centre, and Pamela Youde Nethersole Eastern Hospital) run by paediatricians with dermatology training, but also treating some patients with allergies.

Currently, there is one single immunology/allergy public laboratory service in QMH that provides limited numbers of specific IgE, human leukocyte antigen, and tryptase tests. Clinical investigational laboratories for in-vivo allergen skin tests and challenge protocols are run by specialists in PIID or paediatrics. Food and drug challenges are provided at QMH and PWH on a regular basis, but may be occasionally provided by other hospitals such as QEH, PMH, and Kwong Wah Hospital. The waiting time is generally about 6 months. There are no commonly accepted local challenge protocols, so those used by internationally recognised paediatric allergy centres are followed.

Currently, the four PIID centres have two FTE staff plus four part-time staff who work mainly on food and drug allergies. The trained dietician and nurses work only on a part-time basis. There is also one private PIID specialist.

Clinical guidelines

Local anaphylaxis guidelines have been drafted and are pending approval and implementation. The Hong Kong College of Paediatricians has issued guidelines to improve care for atopic dermatitis. Different hospitals may have different in-house guidelines for asthma or they may be adopted from international guidelines.

Allergen immunotherapy

Allergen immunotherapy is very limited in public service. The reasons are multifactorial and include affordability, availability, and accessibility.

Resources

Lack of central funding may seem to be a hindrance to provision of allergy services, but the real problem is the shortage of skilled staff. Many trained nurses experienced in skin testing and allergy education have left their jobs or have been redeployed to other areas. To cater for the current service demands and to achieve reasonable waiting times, more staff need to be trained urgently, for instance, a resident trainee, advanced practice nurses, and even clerical support.

Current situation for adults

There is currently no formal allergy clinical service provided in the public sector for adults. Clinicians, including a few dermatologists, respiratory physicians and otolaryngologists, who have an interest in allergy provide an ad-hoc service to patients with various allergic disorders. Limited skin prick tests are provided. There are, however, no specialty nurses or technicians specially trained in this area.

In 2013, the Division of Rheumatology and Clinical Immunology, together with the Division of Clinical Immunology (Pathology) set up a Drug Allergy Clinic at QMH to provide consultations for Hong Kong West Cluster patients. Because of resource restrictions, these consultations are limited to the diagnosis and confirmation of general anaesthetic and antibiotic allergies.

Hong Kong has produced only one locally trained immunologist who is an HIV (human immunodeficiency virus) specialist currently working in the Department of Health. There have been no trainees in allergy and immunology since 1998.

Drug allergies

Data retrieved on 30 June 2013 from an analysis of HA data (personal communication) indicate that almost 400 000 patients have drug allergy, with 44 018 having three or more drug allergies. Almost 5000 patients (mainly adults) have three or more antibiotic allergies. This is a huge potential clinical workload that impacts on many other specialties, and is a growing area of allergic disease that needs to be addressed urgently.

Laboratory support services for allergy/immunology

Only one laboratory service for allergy/immunology in Hong Kong is directed by accredited immunologists in the public sector (at QMH). The service cannot offer a complete portfolio of tests because of budgetary constraints.

Training

Paediatric Immunology and Infectious Diseases

The first Fellowships of the subspecialty of PIID were conferred in 2012 (Medical Council Registration S56). Among the first 12 Fellows, five work principally in the field of immunology and allergy. Paediatric units of four regional hospitals (QMH/The University of Hong Kong [HKU], PWH/The Chinese University of Hong Kong [CUHK], PMH, and QEH) are accredited to be the training centres and they have formed a training network. Allergy is an integral part of the PIID programme.

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Higher training in allergy in adult medicine

Allergy and hypersensitivity is one of the five areas of knowledge requirement for the training in allergy and immunology under the Hong Kong College of Physicians (HKCP). The other four areas include autoimmune and immune complex diseases, primary and secondary immunodeficiency, transplantation, and lymphoproliferative diseases. Training in adult allergy is hampered by the lack of trainers and the lack of an allergy clinical service in the public sector.

Immunology

Training of immunology is under the Hong Kong College of Pathologists (HKCPath). The goal of training is to produce specialist immunologists who are able to direct a laboratory service in clinical immunology and tissue typing, to advise clinicians on the management of immunological disorders, including allergy, autoimmunity, immunodeficiency, and malignancy of the immune system. At present such training is only available at QMH where there are two immunologists.

Recommendations

With the introduction of potent targeted biologics, greater understanding of the genetics and epigenetics determining allergic disease expression, improved strategies and vaccines for allergen-specific desensitisation, novel approaches to allergy prevention, and the advent of an era of stratified medicine, the need for more allergists, allergy services, research, and trainees in the specialty have never been more urgently required. In an otherwise high-quality health care landscape in Hong Kong, allergy services and training are a seriously unmet need. The deficiencies should be remedied without delay for the benefit of the patient community.

The recommendations described below are adapted from a recent authoritative report about allergy[23] and should also be seen in the context of the declaration of the World Allergy Organization in 2013.[24]

Model and location

(1) We recommend that urgent advice is sought from the major stakeholders on how one might remedy the unmet need for allergy services and training in Hong Kong.

(2) We recommend that the best model for allergy service delivery is a 'hub-and-spoke' model (Fig 2[23]). The 'hub' would act as a central point of expertise with outreach clinical services, education, and training provided to doctors, nurses, and allied health care professionals in primary and secondary care (the 'spokes'). In this way, knowledge regarding the diagnosis and management of allergic conditions could be disseminated throughout the region. The hub and spokes in its entirety forms the 'allergy centre'. The hub should lead and coordinate the activities of the entire centre.

(3) Each hub should have an allergy service both for adults and for children to share in knowledge transfer and resources. In addition to hubs, a network of satellite allergy services could be established at different hospitals (for instance by changing the emphasis of one or two existing clinics a week designated for respiratory medicine, otorhinolaryngology, and/or dermatology to become allergy clinics), which can then link to one of the allergy hubs for academic, clinical, and educational support. This solution might not incur substantially more resources, as the complex multi-system allergy cases could be transferred from the other clinics and managed in a new dedicated allergy service.

(4) We recommend that paediatric and adult services in an allergy centre should each be led by an allergy specialist and each should be supported by at least one other clinical colleague (another allergy specialist or an organ specialist with a special interest in allergy), at least one trainee, specialist dietician and nursing support, and a technician for routine allergy testing, counselling, and education.

(5) The hub forming the allergy centre will be collaborating, not competing, with single organ specialists or with general paediatricians,

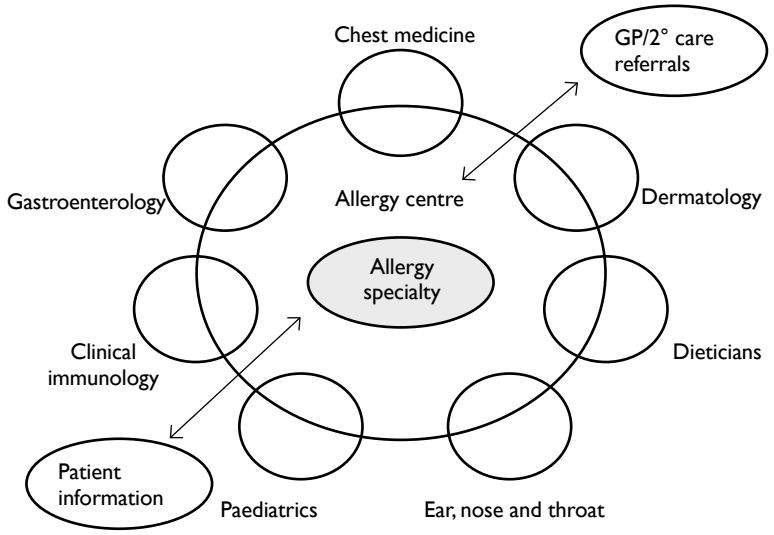

FIG 2. Hub-and-spoke model for an allergy centre (adapted from Reference 23 and contains public section information licensed under the UK Open Government Licence v2.0)
Abbreviations: GP = general practitioner; 2° = secondary

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internists, and general practitioners. It is envisaged that the tertiary allergy centres would work together with other colleagues to provide joint, integrated, and holistic care for the most complex allergy cases, which are often characterised by multi-system involvement. To facilitate this interaction, it is recommended that clear criteria are defined for the types of patients that could be referred to tertiary specialist allergy centres.

Adult allergy

(1) We recommend that two pilot allergy centres are created by recruiting allergy specialists (from overseas if necessary) to start the services and to oversee a training programme.

(2) We recommend that each of the new appointees is a joint appointment between the HA and a university. Each appointee should be supported by three trainees, a specialist nurse, and a dietician.

(3) We recommend that the two pilot allergy centres should be located at QMH/HKU and PWH/CUHK (hubs), so that Hong Kong, Kowloon, and the New Territories are covered. Two pilot centres are required because of the heavy burden of allergic disease and the capacity of a solitary centre in Hong Kong would very soon become overextended. Both QMH and PWH have a long distinguished history of looking after children with allergic and immunological diseases, but both lack a dedicated allergist in adult medicine. Creation of an allergy centre that integrates existing strengths in paediatric clinical/academic/education in allergy with a new adult clinical/academic/education allergy service would be a major catalyst to bridging the obvious gaps in service and academic provision. Formal designation of both hospitals as pilot allergy centres could also provide formal encouragement to hospital and university management for some internal realignment of resources. Finally creating these innovative allergy centres could provide significant opportunities to attract private funding from benefactors to grow the discipline subsequently.

(4) We recommend that metrics for success of each pilot centre be predefined and progress in the first 5 years be assessed against those goals. If the pilot is successful, then the model should be continued and could even be extended to other suitable clinical/academic centres.

(5) We recommend that the HKCP training curriculum for immunology and allergy is updated as soon as possible. In addition, we suggest that the HKCP and HKCPath consider creating an intercollegiate training programme in immunology and allergy to produce clinical immunologists who will direct allergy/immunology laboratories and consult for allergic patients. This can be extended to other colleges and cross-college training is encouraged by the Hong Kong Academy of Medicine. In due course, a core curriculum in allergy could be shared by all interested colleges in addition to a college-specific curriculum. This model is already being explored for sub-specialty training in genetics and genomics among some academy colleges.

(6) We recommend the training of allergy as a main subject to be included in the college training guidelines in allergy and immunology and four allergy and immunology trainees majoring in allergy are recruited every 4 years.

Paediatric allergy

(1) It is envisaged to develop an immunology and allergy centre at the Hong Kong Children's Hospital (HKCH) for management of complex allergy cases from 2018 onwards (a hub). A team of core medical and nursing staff will be based at HKCH, but will also run an outreach programme by linking up with other network hospitals.

(2) When the immunology and allergy centre at the HKCH is operational, there will need to be some reorganisation with parts of the top-tier paediatric allergy services in the 'hub' hospitals being moved to the HKCH (which will then become the new hub), leaving satellite services in the previous 'hub' hospitals (the spokes) in situ.

(3) To facilitate a smooth transition to the HKCH, we recommend at least four to five FTE PIID specialists majoring in allergy/immunology to be appointed to run the top-tier service at the HKCH, to provide training and conduct local relevant audit/research (hub). A further 12 PIID specialists will be required to provide step-down and secondary services in both the training (PMH, PWH, QEH, QMH) and non-training (other HA paediatric units) posts for the specialty and general paediatrics (spokes).

(4) We recommend that common protocols, guidelines, care pathway, and a referral network, especially for complex cases, should be agreed and formally created.

(5) We recommend that four PIID trainees are recruited every 3 years, of which at least two resident specialists majoring in allergy/immunology should be trained. This will maintain a sustainable public workforce for specialty development and cover for normal turnover. It should then be possible to produce 12 PIID specialists in three cycles (around

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9 years), of whom 50% will have majored in allergy/immunology with the rest majoring in infectious diseases. Therefore, the estimated total required workforce for PIID in the public sector for the hub-and-spoke model could be 18 to 20 with eight in the hub (four to five in allergy and immunology and two to three in infectious diseases) and about 12 in the spokes working in both the specialty and general paediatrics.

(6) We recommend that allergy is added to the title of the PIID training programme so it will become a PIAID (paediatric immunology allergy and infectious diseases) programme and the paediatric discipline should also be so named.

Drug allergy

Drug allergy is common and constitutes a major clinical problem, which needs to be managed by allergy specialists. We recommend resources to be made available to establish two separate supra-regional drug allergy services at QMH and PWH (as they already have a limited service) to cover Hong Kong Island and Kowloon/New Territories. This could be part of the new pilot centres.

Laboratory support

We recommend that two supraregional laboratories for Hong Kong should be created with a focus on drug and food allergy that are directed by accredited immunologists. The laboratories should be adequately funded so that they have sufficient manpower, equipment, and budget for reagents to widen the scope of routine laboratory services to include tests for specific IgE to a wide spectrum of whole allergen extracts and to allergen components, basophil activation tests, and lymphocyte function tests. This can be incorporated into existing laboratory support at QMH and PWH with only a relatively modest increase in resources. These laboratories could then support the new pilot centres.

Education

We recommend that collaboration is established between the Hong Kong Institute of Allergy (as the professional platform) and Hong Kong Allergy Association (as the allergy charity) to create an agenda for professional CPD (such as regular workshops) as well as engaging and educating the public about allergy. These organisations are strongly encouraged to involve other professional societies and charities as appropriate when designing their strategies.

Schools

(1) We recommend that the appropriate Government department should audit the level of allergy training staff in schools receive, and consider taking urgent remedial action to improve this training where required.

(2) We recommend that the Government should review the desirability of schools holding one or two generic auto-injectors.

Air quality

Solving the urban air pollution problem is a huge challenge. Bold, realistic, and moral leadership by national leaders is required to address this increasing important public health issue. We recommend that it is essential to develop effective strategies to reduce pollution, to engage the public, and to monitor whether the strategies result in a significant improvement in the prevalence of pollution-related diseases in Hong Kong and mainland China.

Conclusions

Epidemiological data support a rising trend in many allergic diseases. The provision of services and training for specialists in allergy is mismatched with disease burden and there is a large unmet need that should be remedied without delay. Key recommendations are proposed that could help bridge the gaps, including the creation of two pilot allergy centres in a hub-and-spoke model in the public sector. This could require recruitment of specialists from overseas to start the process in the likely event that there are no accredited allergy specialists in Hong Kong who could fulfil this role in the short term.

Declarations of interest

Drs CKW Lai, CS Lau, YY Wu, and Prof TF Leung are consultants or serve on advisory boards and/or receive travel expenses and lecture fees to attend international meetings from various pharmaceutical companies including GlaxoSmithKline, AstraZeneca, Takeda, Mundipharma, Boehringer, ALK-Abello, AbbVie, Bristol-Myers Squibb, Celltrion, Janssen, Novartis, Pfizer, Roche, Sanofi, and Union Chimique Belge. Dr TH Lee is President of the Hong Kong Institute of Allergy and Honorary Clinical Professor, The University of Hong Kong. Dr Marco Ho is Chairman of the Hong Kong Allergy Association.

The Hong Kong Allergy Alliance is a group of individuals with an interest in allergy drawn from academia, HA hospitals, private practitioners, representatives from the HA, Hong Kong Institute of Allergy, Hong Kong Thoracic Society, Hong Kong Allergy Association, patients, and drug company representatives from ALK.

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