

International sore throat guidelines and international medical graduates: a mixed methods systematic review

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ABSTRACT

AIM: To examine national and international guidelines on sore throat management and subsequently, to explore the phenomenon of international medical graduates working in general and rural practice in New Zealand.

METHOD: Two separate systematic reviews were conducted that resulted in a contingent methodology. Contingent methodologies involve syntheses of data that are derived sequentially. The initial review for this study examined international sore throat guidelines and their key points. The results of this initial review resulted in the theory that international medical graduates may be unaware of the New Zealand specific sore throat guidelines and the problem of acute rheumatic fever in this country. The subsequent review examined the phenomenon of international medical graduates working in general or rural practice in New Zealand. Data sources were Medline, Google Scholar, Trip Database, and NHS Evidence, Embase and Scopus. Electronic databases were searched for relevant data published January 2000–December 2013. Additional hand searches found key references from articles and websites.

RESULTS: International guidelines for the management of sore throats differ from New Zealand guidelines. Of resource rich countries, New Zealand has the second highest number of international medical graduates: they may not use New Zealand specific sore throat guidelines.

DISCUSSION: Acute rheumatic fever is virtually eradicated in most resource rich countries. Rheumatic fever rates of among indigenous Māori and Pacifica people in New Zealand have failed to reduce over the last three decades. Knowledge and actions of international medical graduates in relation to sore throat management needs investigating.

KEYWORDS: Sore throats; acute rheumatic fever; clinical guidelines; international medical graduates; mixed methods review

J PRIM HEALTH CARE
2016;8(1):20–29.
10.1071/HC15032

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Introduction

Sore throats are common and one of the top ten reasons for seeing a doctor in New Zealand (NZ).¹ In the NZ European population, most sore throats have viral aetiology, are self-limiting, and resolve without the need for medical intervention.^{2,3} In an estimated 10% of adult and 15–30% of paediatric cases, sore throats are a result of

group A beta-haemolytic streptococcal (GABHS) infection.⁴ Acute rheumatic fever (ARF) is an auto immune multi-system disease that occurs as sequela to GABHS. Throughout the developed world ARF has all but disappeared. For example, a recent study reported in the *British Medical Journal* examined 14 610 adults for complications following an acute sore throat and failed to mention

ARF.⁵ However in NZ, ARF remains a serious illness with high rates among Māori and Pasifika children compared with other children.⁶ Most cases of ARF are seen in the North Island, in poor socioeconomic areas. The rates of ARF in Māori and Pasifika have failed to reduce since the 1980s.⁷

NZ has the highest number of overseas trained doctors in the Organisation for Economic Development and Co-operation (OECD) countries, at 41%, nearly double the level of Australia.^{8,9} These international medical graduates (IMGs), who often hail from countries where ARF has been virtually eradicated such as the UK, may not be aware of the continuing problem of ARF in NZ. Additionally there is a plethora of international guidelines that have been developed to inform sore throat management, many of which aim to decrease antibiotics use in settings of low ARF prevalence, unlike NZ. Some IMGs who work in primary health care or rural practice may be unaware of the NZ specific guidelines developed by the Heart Foundation for sore throat management in Māori and Pasifika people.

This article is guided by a mixed methods systematic review using a contingent methodology and starts with a review of international sore throat guidelines. Our thesis is that guidelines are country specific and many IMGs may be unaware of the problem of ARF in Māori and Pasifika people in NZ. There are no bridging programmes available for IMGs coming to work in primary care here. IMGs may be unaware that access to primary health care, and thus treatment of sore throats, is limited for many Māori and Pasifika people and that this may contribute to the failure of ARF reduction over the past three decades. The persistence of high rates of ARF in NZ is now receiving attention from policy makers. It is timely to explore the preparation for IMGs coming to work in NZ, particularly for IMGs working in general and rural practice.

Methods

We conducted a mixed methods review using a contingent methodology.¹⁰ Contingent methodologies were described by Sandelowski et al. as being one of three frameworks to conduct a mixed methods review.¹¹ The other two ways are

WHAT GAP THIS FILLS

What we already know: Rates of acute rheumatic fever in Māori and Pasifika people in New Zealand are high compared to other developed world countries. These rates have failed to reduce over three decades.

What this study adds: International guidelines regarding sore throat management vary considerably between countries. At 41% of the medical workforce, New Zealand has the second largest number of international medical graduates of 14 resource rich countries.

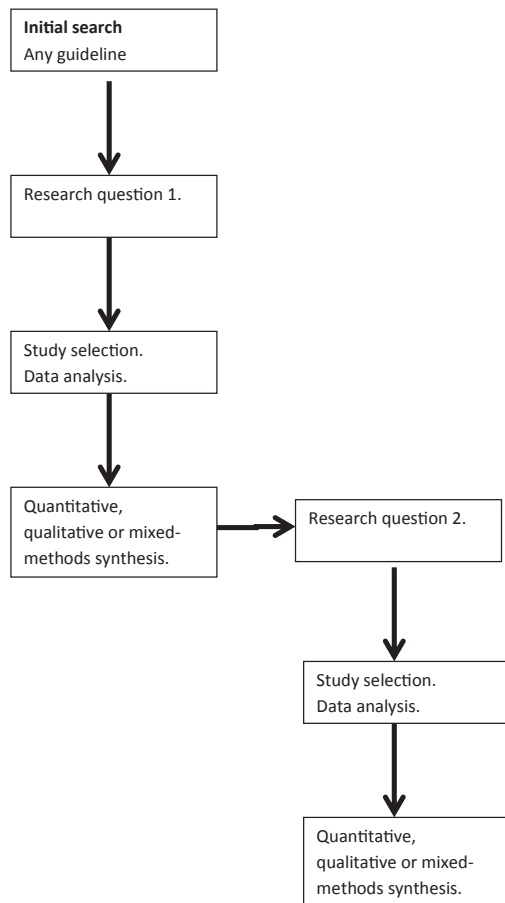
segregated and integrated mixed method systematic reviews. A contingent methodology involves two or more systematic reviews that are conducted sequentially and based on the results of the initial synthesis (see Figure 1). They can use data from qualitative, quantitative or mixed methods studies. In our review the initial data collected pertained to the number of international sore throat guidelines and their key points. The subsequent review focused on a content analysis of studies referring to IMGs working in primary health care in NZ.

The review commenced with searching and appraising international guidelines written in English for sore throat management. After reviewing and synthesising guidelines published between November 2012 and February 2013, it became apparent that there were inconsistencies in guideline recommendations. These inconsistencies led us to theorise that IMGs may be unaware of the specific problem of ARF in NZ and may refer to guidelines from their home countries when practising medicine in NZ.

Determining the search strategy

A systematic search of the literature pertaining to guidelines for sore throats was conducted. The databases accessed were Medline, Google Scholar, Trip Database, and NHS Evidence. Relevant references were retrieved from the reference lists of the guidelines. The search was limited to full text articles published in English January 2000 – December 2012. English language is mainly used in the NZ health system and therefore it was considered unnecessary to

Figure 1. Mixed-method systematic review using a contingent methodology¹⁰



appraise guidelines in other languages. Keyword terms used were ‘guidelines’, ‘pharyngitis’, ‘sore throat’, ‘diagnosis’, ‘management’, ‘antibiotic therapy’, and ‘streptococcus’.

Search outcome

The initial search of quantitative data relating to clinical guidelines in sore throat management elicited 26 suitable guidelines. Following analysis of the guidelines, we conducted a search of Medline, Embase, Google Scholar and Scopus using the search terms ‘international medical graduates’, ‘foreign medical graduates’ ‘overseas trained doctors’, ‘New Zealand’, ‘general practice’, ‘family practice’ ‘rural practice’. This search was limited to full text, English language articles published from January 2000 – December 2013. Reference lists were appraised to identify policy

documents and literature from medical professional bodies. The New Zealand Ministry of Health and Medical Council of websites were explored for information on IMGs.

Only eight articles were identified following this search and so ‘Australia’ was added as a search term due to its close ties with NZ’s medical system via the Trans-Tasman agreement. Adding ‘Australia’ as an additional search term elicited a further four articles.

Quality appraisal and data

KH and EW appraised all of the guidelines and used the AGREE Collaboration’s criteria for high quality clinical practice guidelines¹² (Box 1). Twenty guidelines met these criteria. The data were subject to content analysis and then organised by EW and KH into key themes.

Quality reporting standards are increasingly expected in health services research. The recently developed RAMESES (Realist and Meta-review Evidence Synthesis: Evolving Standards) publication standard was followed.¹³ The authors of this standard emphasise the importance of transparency in reporting the results of a realist or meta-review evidence synthesis. The authors considered the RAMESES standard an appropriate guide to convey the transparent process involved in the selection of data.

Figure 2 illustrates the RAMESES process that KH and EW used to determine data selection from 59 articles initially retrieved during the second search. Only 12 articles referred to IMGs working in general or rural practice in NZ or Australia and all of these were appraised and included in a content analysis. A further three articles were sourced following scrutiny of the reference lists of the original 12 articles. Additionally the websites of NZ’s Ministry of Health, NZ Medical Council and the OECD were accessed.

Results

From analysis of data produced by the first search, the first theme refers to discrepancies in guideline recommendations. The subsequent

three themes were constructed following the second search. All of the themes were reviewed by BA. The themes form the following four sub-headings:

Theme 1: Discrepancies in guideline recommendations in reference to ARF

See Table 1 for the main recommendations and major findings for each of the 20 guidelines. Only three of the five guidelines from Europe specifically refer to ARF. The English guideline does not mention ARF and the guideline from Scotland stipulates that antibiotics should not be prescribed to prevent ARF. This guidance contradicts NZ's algorithm for sore throat management.¹⁴ Of the five guidelines from North America, only four mention ARF. There were eight guidelines from the Asia Pacific region and, excluding three guidelines from NZ, only two of the remaining five discussed ARF. One of the Australian publications stated that focused programmes of early GAS pharyngitis diagnosis and management in populations at high risk of ARF have not yet been shown to translate to a significant reduction in ARF incidence. The single guideline from South Africa does make reference to ARF. It was the discrepancy in guideline recommendations and their potential influence on the knowledge/attitudes and skills of IMGs that prompted the authors to consider the role of IMGs in primary health care in NZ.

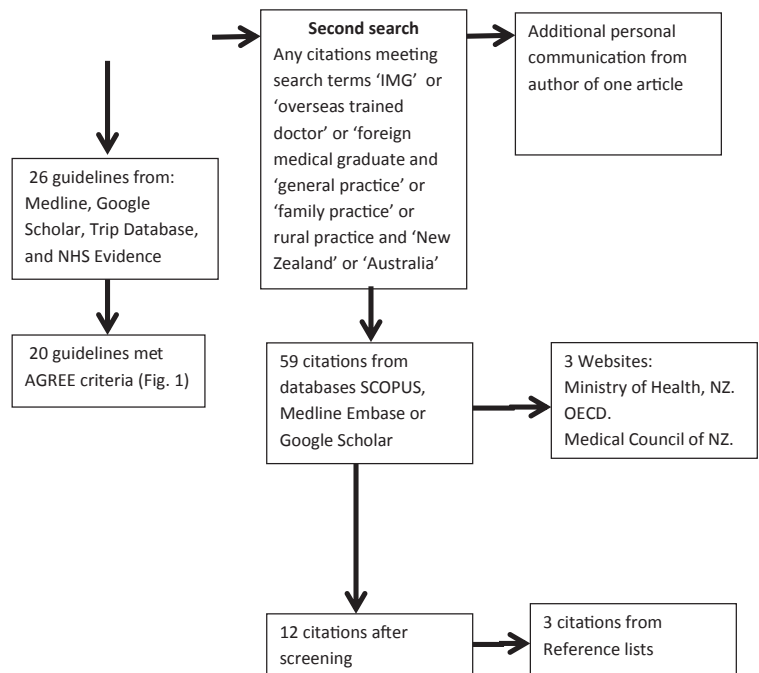
Theme 2: Migration of IMGs

Migration of medical graduates is not a new phenomenon. The first half of the 20th Century saw doctors moving from developed countries to developing countries (low and middle income), whereas the latter part of the 20th Century saw a reversal of the flow, from developing countries to developed ones. This direction of movement of doctors from low and middle income countries to high income countries caused concern internationally.¹⁵ There has also been substantial migration of UK trained doctors to Australia, Canada and the USA, unmatched by a flow from these three countries to the UK.¹⁵ The latest Medical Council of NZ workforce survey from data collected to comply with the Health Practitioners Competency Act 2003 showed that IMGs were

Box 1. AGREE criteria of high quality clinical guidelines¹²

Scope and purpose	Contain a specific statement about the overall objective(s) clinical question.
Stakeholder involvement	Provide information about the composition, discipline, and relevant expertise of the guideline development group and involve patients in their development. They also clearly define the target users and have been piloted prior to publication.
Rigour of development	Provide detailed information on the search strategy, the inclusion and exclusion criteria for selecting the evidence, and the methods used to formulate the recommendations. The recommendations are explicitly linked to the supporting evidence and there is a discussion of the health benefits, side effects and risks. They have been externally reviewed before publication and provide detailed information about the procedure for updating the guideline.
Clarity and presentation	Contain specific recommendations on appropriate patient care and consider different possible options. The key recommendations are easily found. A summary document and patients' leaflets are provided.
Applicability	Discuss the organisational changes and cost implications of applying the recommendations and present review criteria for monitoring the use of the guidelines.
Editorial independence	Include an explicit statement that the views or interests of the funding body have not influenced the final recommendations. Members of the guideline group have declared possible conflicts of interest.

Figure 2. Flow diagram illustrating RAMESES search process



41.4% of medical practitioners registered in NZ. This percentage increased from 34% in 2003.¹⁶ Of the 14 countries belonging to the OECD, NZ has

Table 1. Main recommendations from guidelines

Publication Europe	Main Findings/Major Recommendations
Croatia: ISKRA Guidelines on Sore Throat: Diagnostic and Therapeutic Approach – Croatian National Guidelines. ²⁸	Decision to perform bacteriology testing (RADT or throat culture) for GABHS guided by Centor score. Centor score 0–1: no testing and no antibiotic therapy. Centor score 2–4: perform RADT or throat culture, prescribe antibiotics if positive. In severe clinical presentations, antibiotics may be prescribed before the culture results are known, and if results are negative, antibiotics should be withdrawn. Antibiotics should be used in case of acute sore throat regardless of the Centor criteria in case of: very severe general condition; suspected peritonsillar infiltrate or abscess; ARF in personal or family history.
England: Prescribing of Antibiotics for Self-Limiting Respiratory Tract Infections in Adults and Children in Primary Care. ²⁹	Adults and children over 3 months with acute sore throat should be given a clinical assessment to identify relevant clinical signs, based on Centor score. Three antibiotic prescribing strategies recommended: no prescribing, delayed prescribing, and immediate prescribing. If >3 Centor criteria are present, depending on sore throat severity, consider an immediate antibiotic prescribing strategy (in addition to a no antibiotic or a delayed antibiotic prescribing strategy).
Europe: ESCMID Guideline for the Management of Acute Sore Throat. ³⁰	Centor clinical scoring system should be used. In patients with 0–2 Centor score, RADT not recommended and antibiotics should not be prescribed. In patients with 3–4 Centor score, consider RADT, and consider discussion of the likely benefits of antibiotics with patients. Modest benefits of antibiotics in GABHS-positive patients and patients with 3–4 Centor criteria have to be weighed against side effects, the effect of antibiotics on the microbiota, increased antibacterial resistance, medicalization and costs. Throat culture is not necessary for routine diagnosis of acute sore throat. If RADT is performed, throat culture is not necessary after a negative RADT.
France: Systemic Antibiotic Treatment in Upper and Lower Respiratory Tract Infections: Official French Guidelines. ³¹	In clinical practice, RADT are recommended and not throat cultures. Some very rare situations suggest ARF risks: individual medical history of ARF; age between 5 and 25 years, associated with some environmental conditions; particular bacterial epidemics (rheumatogenic GABHS strains); medical history of recurring GABHS pharyngitis; stays in streptococcal-endemic regions. In such contexts, a negative RADT could be further investigated by throat culture, and if positive, antibiotic therapy should be initiated.
Italy: Management of Acute Pharyngitis in Children: Summary of the Italian National Institute of Health Guidelines. ³²	A McIsaac score of 0–1 can be considered valid to rule out GABHS pharyngitis, in settings with no GABHS epidemics and/or with low prevalence for ARF. RADT should be performed in every child with history and signs/symptoms suggestive of GABHS pharyngitis. Throat cultures are not recommended. Antibiotic therapy is recommended in every child with microbiologically documented GABHS pharyngitis, treatment should be prescribed on diagnosis. Starting antibiotic therapy within 9 days of symptoms onset does not result in an increased risk of complications, therapeutic failure, or relapses.
Scotland: Management of Sore Throat and Indications for Tonsillectomy: A National Clinical Guideline. ³³	Centor score should be used to assist the decision on whether to prescribe an antibiotic, but cannot be relied upon for a precise diagnosis. Throat swabs should not be carried out routinely in primary care management of sore throat. Antibiotics should not be used to secure symptomatic relief. In severe cases, antibiotics should not be withheld. Sore throat should not be treated with antibiotics specifically to prevent the development of ARF.
North America	Main Findings/Major Recommendations
Canada: Diagnosis and Management of Sore Throat. ³⁴	A throat swab should be taken when GABHS pharyngitis suspected from the McIsaac score and epidemiological findings. Antibiotics should not be prescribed until throat swab confirms GABHS. Immediate administration of antibiotics should be considered only when patients are very ill, culture results will be delayed more than 72 hours, or patient follow-up will be difficult. Antibiotics should be discontinued if the culture result is negative.

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Table 1. (continued)

North America	Main Findings/Major Recommendations
USA: Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America. ³⁵	Testing for GABHS pharyngitis by RADT and/or culture should be done as clinical features alone do not reliably discriminate between GABHS and viral pharyngitis. In children and adolescents, negative RADT tests should be backed up by a throat culture. The use of a clinical algorithm without microbiological confirmation is an acceptable alternative basis for diagnosis of infection in adults.
USA: Diagnosis and Treatment of Respiratory Illness in Children and Adults. ³⁶	Algorithm used to aid diagnosis of causative agent and management of GABHS pharyngitis. Diagnosis should be made by laboratory testing rather than clinically. Antibiotic treatment should be delayed until results confirm GABHS. Clinical findings are not specific enough to GABHS to allow empiric treatment without testing. RADT followed by throat culture for confirmation of negative result used to definitively diagnose.
USA: Practice Guidelines for the Diagnosis and Management of Group A Streptococcal Pharyngitis. ³⁷	Clinical diagnosis dependent on features suggestive of GABHS: sudden onset; sore throat; fever; headache; nausea, vomiting, and abdominal pain; inflammation of pharynx and tonsils; patchy discrete exudate; tender, enlarged anterior cervical nodes; patient aged 5–15 years; presentation in winter or early spring; history of exposure. Features suggestive of viral aetiology: conjunctivitis; coryza; cough; diarrhoea. Unless the physician to exclude GABHS, a laboratory test should be done.
USA: Prevention of Rheumatic Fever and Diagnosis and Treatment of Acute Streptococcal Pharyngitis. ³⁸	Accurate diagnosis of GABHS pharyngitis based on history and clinical findings is often difficult. Microbiological confirmation, a throat culture or RADT, is required for the diagnosis. The use of a clinical algorithm without microbiological confirmation has been suggested for diagnosing GABHS pharyngitis in adults but not children, but could result in inappropriate antimicrobial therapy and is not recommended. Treatment is indicated for the patient with acute pharyngitis who has a positive RADT. As with the throat culture, a positive RADT may reflect GABHS colonization, with the acute illness caused by another agent. A throat culture should be performed to confirm negative RADT.
Asia & Australasia	Main Findings/Major Recommendations
Australia: The Australian Guideline for Prevention, Diagnosis and Management of Acute Rheumatic Fever and Rheumatic Heart Disease. ³⁹	In high-risk populations where clinical follow up may be difficult, the empirical management of pharyngitis with antibiotics in those at risk of ARF is recommended. Where possible, a throat swab culture should be undertaken, and antibiotic treatment should be based on culture results. The utility of clinical scoring systems, RADT and other rapid diagnostic tests in predicting the presence of GABHS pharyngitis needs to be evaluated in Australia, particularly in Aboriginal and Torres Strait Islander communities.
Australia: Children and Infants with Sore Throats - Acute Management. ⁴⁰	Use Centor scoring criteria to diagnose GABHS pharyngitis: a Centor score of 3–4 will support diagnosis of GABHS pharyngitis, while 2 items would justify consideration of a throat swab, or RADT if available. For a score of 0–1, GABHS can be excluded. Throat swabs are do not differentiate between acute infection and carrier-state and are not generally recommended. Antibiotics generally confer limited symptomatic benefit and minimal benefit in preventing complications of GABHS infection, except possibly in high-risk populations such as indigenous groups.
India: Consensus Guidelines on Pediatric Acute Rheumatic Fever and Rheumatic Heart Disease. ⁴¹	Onset of symptoms is sudden. Clinically patient has high fever, sore throat with pustules, strawberry tongue, petechiae on palate and tender anterior cervical lymph nodes. The following investigations should be done: throat culture, RADT, antistreptolysin O (ASO), erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and complete blood counts. Streptococcal eradication is done with appropriate antibiotics. In absence of effective streptococcal vaccine, early detection of GABHS pharyngitis and its treatment is the only primary prevention of ARF.

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Table 1. (continued)

Asia & Australasia	Main Findings/Major Recommendations
Malaysia: Clinical Practice Guidelines -Management of Sore Throat. ⁴²	It is recommended that the decision to perform a laboratory test for suspected GABHS pharyngitis be based on the McIsaac scoring system. Diagnosis of GABHS pharyngitis should be based on clinical and epidemiological findings, supported by laboratory test, either a positive throat culture or RADT, and a negative RADT should be confirmed with a throat culture. Due to practical constraints (e.g. lack of accessibility, cost of throat cultures, and lack of follow-up), antibiotics should be started if GABHS is clinically suspected, the patient is toxic-looking and follow-up is not possible.
New Zealand: Management of Group A Streptococcal Sore Throat for the Prevention of Acute Rheumatic Fever. ⁴³	Diagnosis guided by the use of a clinical algorithm, specific to New Zealand context. Antibiotics should be initiated as soon as possible as there is no evidence to support delaying treatment by up to nine days. Children at high risk of ARF should receive empiric antibiotic treatment and GABHS should be confirmed by laboratory culture. Symptoms suggestive of GABHS pharyngitis: history of fever; tender anterior cervical adenopathy; exudative tonsillitis; and lack of cough.
New Zealand: Group A Streptococcal Sore Throat Management. ⁴⁴	A patient's risk of ARF should be made at the start of the consultation as per the sore throat management algorithm. Those in high ARF-risk households may be swabbed regardless of age to prevent GABHS pharyngitis spreading within the household. McIsaac clinical scoring system used to predict GABHS infection. Throat culture is recommended to confirm GABHS. Treatment can be delayed until culture results available, up to nine days.
New Zealand: NZ Primary Care Handbook. ⁴⁵	Antibiotics should be initiated as soon as possible as there is no evidence to support delaying treatment by up to 9 days. Children at high risk of developing ARF should continue to receive empiric antibiotic treatment, and the presence of GABHS should be confirmed by laboratory culture.
Taiwan: Guidelines for Antimicrobial Therapy of Acute Upper Respiratory Tract Infections in Taiwan. ⁴⁶	No antimicrobial treatment except for suspected GABHS pharyngitis. Symptoms highly suggestive of GABHS pharyngitis are sore throat, exudative pharyngitis, and cervical lymphadenopathy; symptoms not suggestive include cough, rhinorrhoea, pharyngeal ulcer, and conjunctivitis.
Africa	Main Findings/Major Recommendations
South Africa: Guideline for the Management of Upper Respiratory Tract Infections. ⁴⁷	Clinical diagnosis of GABHS pharyngotonsillitis: - Points in favour of empiric antimicrobial treatment: acute onset; temperature >38°C; tender anterior cervical nodes; tonsillar erythema/exudates; age 3–15 years; previous ARF/RHD. - Points against empiric antimicrobial treatment: rhinorrhoea; cough; diarrhoea; conjunctivitis; age >45 years. In South Africa, widespread use of throat cultures is unlikely as an extensive infrastructure would need to be established for an easily treated condition.

the second largest number of registered IMGs: only Ireland has more.⁹

One study of 282 UK trained doctors working in NZ showed that only one third had intended to stay when they first left the UK but by the time of the study's survey, 9 out of 10 intended to stay 'probably' or 'definitely'.¹⁵ These doctors may have initially been 'medical tourists' who managed to acquire permanent residence in New Zealand.¹⁷ Garces-Ozanne

et al.¹⁸ examined the mobility of medical practitioners throughout NZ during 2000–2008 using data obtained from the Medical Council of New Zealand's register of physicians. In 2008 vocationally trained general practitioners (GPs) who were reported as IMGs from English speaking (developed countries) comprised 30% of the total number of vocationally trained GPs in NZ. Doctors reported as 'trained elsewhere' comprised 25% of the GP workforce (there may be duplicates in the reporting of where IMGs

trained). IMGs tended to practice in minor urban and rural areas with socio-economically deprived populations.

Health of IMGs

Lillis et al.¹⁶ suggested that many IMGs have experienced difficulty integrating into the NZ workforce but there has been little formal research examining the reasons for this. Their qualitative study identified 'work issues' as a key theme for successful integration into the NZ hospital system. Participants noted discrepancies between the culture of medicine in their country of origin and aspects of working life in NZ. Hospital staff had high expectations of IMGs, requiring them to function independently and competently as soon as they started work. One small NZ study investigating the opinions of hospital based doctors and nurses on the training needs of IMGs found potential areas for improvement in skills including communication with patients, families and health professionals, documentation, knowledge of the health system and some aspects of patient management.¹⁹ Australian researchers cited culture shock as having an adverse effect on the mental and physical health of IMGs, leading to poor general well-being and psychosomatic symptoms.²⁰ Other Australian studies cited communication as a key problem for IMGs.²¹⁻²³ Different accents and cultural norms as well as colloquial language and idioms cause difficulty for IMGs. Additionally when the profession investigates poor practice, there has been an association with professional isolation and a lack of insight into behaviour.²⁴ Hawken²⁰ suggests that tools should be developed to identify IMGs most able to adapt and change their behaviours to work in NZ.

Access to continuing medical education for IMGs

Between 2001 and 2004 NZ offered re-training programmes for IMGs. These courses have been discontinued and have not been replaced²⁵ as their purpose was specifically to redress an error regarding registration of a group of migrant doctors in the 1990s.²⁰ Many of NZ's practising GPs who are also IMGs are not vocationally registered. It has been suggested that vocational

registration for IMGs is too slow and an onerous under-taking.¹⁷ Kearns et al.²⁶ investigated factors that keep doctors 'in place' and stop their departure from practice in rural NZ. Their in-depth interviews with nine IMGs highlighted the difficulty of attending continuing medical education sessions provided by district health boards and primary health organisations. Reasons for non-attendance were travel time, costs, and time away from their practice.

Discussion

One of the fundamental tenets of clinical governance is the use of evidence-based information.²⁷ Clinical guidelines are an important source of information for clinicians in ensuring best practice in patient care. Our review has highlighted the discrepancies in international guidelines for sore throat management. IMGs tend to practice in New Zealand in minor urban and rural areas with less affluent populations who are more at risk of contracting ARF.^{6,18} Furthermore they may have difficulty attending CME sessions.²⁶ Additionally, as vocational registration is meaningful from a patient-safety perspective, it is concerning that many IMGs who work as GPs have not met this standard.¹⁷ To gain registration in NZ, IMGs have to pass the NZRex examination that does include a cultural competency component. However, IMGs, may never be exposed to patients at risk of contracting ARF in an examination scenario (personal communication). Bridging programmes are not consistently available for IMGs.

The strength of this review is that it followed the AGREE and RAMESES statements which are both recognised as quality consensus tools providing transparency in data appraisal. Transparency helps readers decide for themselves if reviewer judgements made are reasonable, both for the topic and from a methodological perspective. Additionally, findings from the current research, notably that NZ is heavily reliant on IMGs and that guidelines for sore throat management are country specific, are plausible. A limitation is that the themes developed from data were constructed by KH, EW and BA and other researchers may have developed alternative themes.

This review has highlighted that NZ has a unique problem in the developed world with respect to ARF management: IMGs may lack this knowledge and so not adhere to NZ specific guidelines for sore throat management. As NZ is heavily reliant on IMGs, it is timely that their knowledge and actions regarding care of Māori and Pacifica people is investigated. There is a need for research to gauge the knowledge of IMGs who practice as GPs regarding the NZ specific guidelines for sore throat management. Urgent action is needed in NZ to reduce the levels of ARF in Māori and Pacifica peoples.

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