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Analysis of the Advanced Choice of Employment (ACE) scheme for facilitation of first-year house officer appointments in New Zealand

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Abstract

Aim To determine the success of the Advanced Choice of Employment (ACE) scheme, a computerised matching system introduced to facilitate the recruitment of first-year house officers in New Zealand.

Methods ACE data was examined for demographics and employment outcomes in 2003 and 2004. Qualitative satisfaction was assessed via email survey of trainee intern applicants in 2003.

Results All first-year house officer positions were filled within one round of matching. New Zealand trainee intern graduates were more successful than other applicant groups. The majority of successful applicants were employed by their most preferred hospital and 96% in one of their top four choices in both years. Tertiary centres were preferred over secondary centres. Survey demonstrated generally high satisfaction.

Conclusions The ACE scheme proved highly efficient and successfully accounted for applicant preferences. In addition, the emergence of centralised application data may improve workforce planning and increase retention of graduates.

Recruitment and retention of junior doctors has become an issue of public interest in New Zealand due to well documented workforce shortages.[1] Ongoing media publicity about junior doctors seeking increased remuneration overseas has heightened concern,[2,3] as has evidence that high student debt encourages emigration of medical graduates.[4]

One important component in the retention of junior doctors is attracting and appointing graduates into the New Zealand workforce. From the mid-1970s to the 1980s, postgraduate year 1 (PGY1) appointments were coordinated via a centralised recruitment scheme (MATCH). There is little available documentation about the success or otherwise of MATCH, but it was abandoned in 1989.

Since then, a 'hands-off' recruitment model has operated, with individual District Health Boards (DHBs) responsible for all aspects of PGY1 recruitment. This model was protracted by multiple transactions extending months beyond the first announcement of job offers, allowing little certainty for employers and employees. The model may also have further contributed to overseas emigration of graduates as those graduates uncertain of New Zealand employment sought positions in Australian Hospitals.

In 2003, New Zealand's DHBs collectively implemented a new scheme for coordinating the recruitment of first-year house officers. Named Advanced Choice of

Employment (ACE), the scheme was designed for 'efficiently matching applicants with their most preferred employer and vice versa, with the sole purpose of speeding the job offer and acceptance process'.[5]

We conducted a review of the ACE scheme to determine its success. We hereby publish our results to enhance understanding of the scheme for future graduating doctors and their employers, and to fill a gap in the literature regarding optimal workforce transition from undergraduate training to the medical workforce. The review also reveals new information regarding the junior doctor workforce in New Zealand.

Overview of the New Zealand ACE scheme

In 2002, all 21 of New Zealand's DHBs committed to a centralised recruitment strategy for first-year house officer positions. In 2003, an independent body (the ACE Centre) was established to coordinate the scheme and advertise it widely through website, booklets, presentations, and as part of a recruitment 'road-show' visiting four major centres. The ACE centre published a series of deadlines to ensure the scheme worked to a preset timeframe.

Applicants for PGY1 positions in New Zealand were required to make a single application to the ACE Centre via internet or post. Candidates were asked to provide curriculum vitae, nominate three referees, and to 'list the DHBs you are applying to in order of preference'.[6] Applicants did not rank DHB by whom they did not wish to be employed.

The ACE Centre collated applicant details and electronically transferred them to those DHBs listed by the applicant. DHBs were blinded to their potential employees order of preference. DHB staff assessed these applications by individual methods and returned a list of desired employees to the ACE Centre, again in ranked order of preference. DHBs did not rank those candidates who they deemed unsuitable for employment. DHBs also reported their quota of available first-year house officer positions to the ACE Centre.

The ACE Centre used a computer algorithm to impartially match the two ranked preference lists received from applicants and DHBs. Candidates were matched to their most preferred hospital that had ranked them within their quota boundary of available positions through repeated iterations of the algorithm. After matching, the ACE Centre approached all matched applicants on the same date with employment offers.

It was intended that unmatched applicants would be invited to enter a second round of matching later in the year (2003), when revised quotas of unfilled PGY1 positions were returned from DHBs.

The same process was used for facilitating PGY1 employment in 2004, however application was only available via the internet.

Methods

To determine the ACE scheme's success, recruitment data was made available by the ACE Centre for 2003 and 2004. This data was used to determine the number and type of PGY1 applicants and to assess how successful the ACE scheme was at facilitating their employment. Comparison was made between secondary and tertiary DHBs for total applicant numbers, number of applicants per position available, and ranking priority of applicants.

Qualitative satisfaction of the ACE scheme was assessed via an email survey of trainee interns graduating in 2003. New Zealand Registration Exam (NZREX) and overseas applicants were not surveyed. Questions included satisfaction with the ACE process, and determined aspects that were problematic.

Results

In 2003, 304 first-year house officer positions were available at the commencement of the first round of ACE. 404 completed applications were received from four groups: 316 New Zealand citizen/permanent resident trainee intern (TI) graduates (Group 1), 15 non-resident trainee intern graduates (Group 2), 53 overseas trained doctors who had successfully completed the NZREX exam (Group 3) and 20 doctors who applied from overseas (Group 4). All 304 positions were filled within one round of matching, thus making further rounds unnecessary.

In 2004, there were 299 first-year house officer positions available. 413 completed applications were received from 291 Group-1 applicants, 43 Group-2 applicants, 53 Group-3 applicants, and 26 Group-4 applicants. All 299 positions were filled within one round of matching.

Analysis of successful (or otherwise) application by group type is presented in Table 1.

Table 1. Applicants for first-year house officer positions

Applicant Type	Total	Successful (%)	Unsuccessful* (%)
2003 ACE Scheme			
NZ Trainee Intern (TI) *(Group 1)*	316	297 (94%)	19 (6%)
Non-resident TI *(Group 2)*	15	1 (7%)	14 (93%)
NZ Rex *(Group 3)*	53	6 (11%)	47 (89%)
Other overseas *(Group 4)*	20	0 (0%)	20 (100%)
2004 ACE Scheme			
NZ Trainee Intern (TI) *(Group 1)*	291	289 (99%)	2 (1%)
Non-resident TI *(Group 2)*	43	0 (0%)	43 (100%)
NZ Rex *(Group 3)*	53	10 (19%)	43 (81%)
Other overseas *(Group 4)*	26	0 (0%)	26 (100%)

*Includes withdrawals.

In 2003 and 2004, several applicants failed to achieve employment due to a relative shortage of positions, so (in 2003) several DHBs subsequently created additional first-year positions and conducted recruitment independent of ACE. Seventeen of the 19 unmatched Group 1 applicants subsequently secured PGY1 positions in New Zealand. No additional PGY1 positions were secured by any Group 2, Group 3, or Group 4 applicants. In 2004, no additional positions had been created by the time of writing (September).

The majority of successful applicants were employed by their most preferred DHB (72% in 2003 and 86% in 2004). In both years, 96% of successful applicants achieved employment in one of their top four choices (Table 2).

Table 2. Preference ranking achieved by successful applicants

2003 ACE Result				2004 ACE Result		
Applicant preference ranking	**Number of successful placements**	**% Matched**		**Applicant preference ranking**	**Number of successful placements**	**% Matched**
1st	219	72%		1st	258	86%
2nd	43	86%		2nd	21	93%
3rd	16	91%		3rd	6	95%
4th	13	96%		4th	4	96%
5th	3	97%		5th	4	97%
6th	4	98%		7th	2	98%
8th	1	98%		9th	2	99%
9th	2	99%		13th	1	99%
12th	1	99%		14th	1	100%
>12th	2	100%			(299)	
	(304)					

Most applicants ranked more than four locations (2003 mean 8.7; 2004 mean 8.5).

DHBs containing tertiary services received more applications than DHBs containing secondary services ($p<0.01$ for 2003, $p<0.02$ for 2004). In 2003, tertiary service DHBs received a mean of 237 applications, whereas secondary service DHBs received a mean of 170 applications. In 2004, tertiary service DHBs received a mean of 260 applications, whereas secondary service DHBs received a mean of 205 applications.

DHBs with secondary services processed more applications for each position filled ($p<0.01$ for 2003 and 2004). The mean number of applications per secondary service hospital position were 23.7 in 2003, and 34.2 in 2004. The mean number of applications per position for tertiary service hospital position were 7.8 in 2003, and 9.7 in 2004.

More applicants voiced preference for working at tertiary hospitals, ranking them higher in their preference lists than secondary hospitals. The mean number of applications processed by tertiary hospitals in which the hospital was ranked among the applicant's top four most preferred working destinations was higher in 2003 (56%) and 2004 (50%) than those processed by secondary hospitals in 2003 (27%) and 2004 (24%) ($p<0.01$ for 2003, $p<0.02$ for 2004).

Qualitative

331 trainee interns were surveyed in 2003, with 83 (25.1%) respondents. Despite a low response rate, trends in opinion were discernible for three aspects of the ACE scheme: general satisfaction, transparency, and unmatched candidates.

General satisfaction—Thirty-three respondents (39%) made positive comments about the speed and/or ease of using ACE. Forty-three (59%) respondents made no comment on satisfaction. One respondent voiced dissatisfaction and preference for the previous system.

Transparency—Of 23 respondents who commented on transparency, 22 stated that they did not find the process transparent enough. The majority of these respondents identified the non-publication of the matching algorithm as their chief concern. Two responses expressed a lack of confidence in the ACE centre to handle employment documentation.

Unmatched candidates—Candidates who were unmatched expressed disappointment that there was no second round of matching. Two respondents stated that they thought that ACE guaranteed all New Zealand graduates a PGY1 job.

Discussion

This review demonstrates the ACE scheme to be highly effective in assisting smooth transition from education to the PGY1 workforce. In its first two years, ACE successfully facilitated matches for all available PGY1 positions in New Zealand within one round of applications. This recruitment was achieved with much greater efficiency than in previous years, when multiple rounds of individual negotiation between employers and applicants would extend the process over a number of months beyond the first announcement of job offers.

The scheme successfully accounted for applicant's preferred working locations, placing the majority in their most preferred location and the high majority in one of their top four most preferred locations.

The success of the ACE scheme accords with overseas experience. In Victoria (Australia), a state-wide 'match' has been run annually for a number of years and manages to allocate (on average) 98% of applicants to one of their top three choices of employment.[7] In the United States, a large nationwide 'match' is used every year to allocate positions on residency programmes.

Qualitative survey trended towards satisfaction with the scheme among respondents. This outcome may be biased by the fact that only the most successful group of applicants were surveyed, although applicant success or otherwise should not be equated with satisfaction with the ACE process. Although not surveyed, satisfaction was likely to be higher for the 2004 cohort as applicant concerns from 2003 were addressed. For example, to address transparency concerns the ACE matching algorithm was published in the applicant guidelines, league tables of percentages of successful applicants were published, and an online tracking system was made available to allow applicants to electronically track the progress of their application.

These improvements were coupled with a significant education programme to assist potential applicants in understanding the ACE process, including dispelling the myth that ACE guarantees all applicants a job, or indeed has any control over individual DHB employment decisions.

The ACE scheme lessens the administrative burden on applicants and their referees who now fill out only one application form or reference per candidate. However, one associated detracting factor highlighted by this paper is the heavier administrative requirement on employing DHBs who must process a large number of applications; the burden likely falls more heavily on secondary hospitals as they receive more applications per position available and presumably have fewer personnel.

Secondary service DHB were generally less preferred by applicants than tertiary hospitals; this echoes a recognised difficulty in recruiting medical staff for the provincial workforce.[1]

A further benefit of ACE is in creating a centralised clearing-house of applicant data, which may allow improved workforce planning as new information is generated each year. For example, this review reveals a 'bottleneck' with excess doctors vying for employment at the first post-graduate year of experience.

The widely publicised shortage of junior doctors generally occurs after this first year of medical experience when graduates emigrate fully registered and more experienced.[8] In addition to overseas students at New Zealand medical schools, additional applicants have recently been generated in larger numbers through a retraining programme (NZ-REX) for overseas doctors resident in New Zealand formerly unable to seek employment due to non-transferable qualifications.

Although there is an excess of PGY1 applicants, the 2004 ACE data shows there are currently insufficient New Zealand resident Trainee Intern graduate (Group 1) applicants for the early workforce. Data presented for 2003 (Table 1) misrepresents this fact because a number of non-resident trainee intern graduates (Group 2 applicants) applied as New Zealand resident/permanent citizen (Group 1) applicants in the first year of ACE.

Therefore applicants from Group 2 and Group 3 fill an important gap in the New Zealand PGY1 workforce, although this review also reveals that such applicants are disproportionately unsuccessful when applying for first-year house surgeon positions.

One unexpected effect of having a centralised clearing house of applicant data was an increase in the number of PGY1 positions offered in 2003 after the 304 advertised positions available through ACE had been filled. This extra recruitment occurred when DHBs were made aware of unmatched candidates and took independent action outside of ACE. The resulting increased retention of graduates may not have been possible in previous years when PGY1 employment data was not collected and distributed by a central body. It is likely that several of these extra positions were produced by opening vacant second-year positions to first-year candidates.

The ACE scheme should have a strong future in New Zealand. It is effective in smoothing workforce transition with appointments compatible with applicant wishes, and ACE may also provide a useful tool to monitor the junior medical workforce and contribute to retention of graduates.

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