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Predictors of psychological resilience amongst medical students following major earthquakes

This study aimed to identify predictors of psychological resilience among medical students, surveyed 7 months following the February 2011 Canterbury earthquake. Resilience could be predicted to a moderate extent. However, the factors that were the best predictors of resilience were mostly not easily amenable to change, once the adversity had occurred.

Understanding Pasifika youth and the obesogenic environment, Auckland and Wellington, New Zealand
Ridvan Tupai-Firestone, Hana Tuisano, Moana Manukia, Keawe’aaimoku Kaholokula, Sunia Foliaki, Te Kani Kingi, Rozanne Kruger, Bernhard Breier, Angelique O’Connell, Barry Borman, Lis Ellison-Loschmann

Chewing the facts on fat is a study that aimed to develop an overall understanding of the factors that may drive the obesogenic environment among Pasifika youth from the Auckland and Wellington regions. This pilot work explores familial, cross-generational and social-cultural meanings of diet, weekly food-spending habits, body size, and cultural heritage. Such knowledge could offer in-depth cultural insights of obesity and health, and be used to develop creative and innovative ways to promote health and wellbeing strategies among young Pasifika.

What do African new settlers in New Zealand ‘know’ about HIV?
Mark Henrickson, Meaghan Fisher, Adrian Ludlam, Fungai Mhlanga

A two-phase study of Black African new settlers to New Zealand was conducted to assess knowledge, attitudes, behaviours and beliefs about HIV. The first phase of the study (AfricaNZ Count) estimated that there were 12,500 Black African new settlers in New Zealand, living in four major urban areas. The second phase (AfricaNZ Care) consisted of 705 survey participants, and 131 participants in 23 different focus groups around New Zealand. Survey participants indicated high levels of basic knowledge about HIV in older people, but much less basic knowledge in young people brought up in New Zealand. However, focus groups showed that this assessment of basic knowledge was insufficient, and that there were other kinds of social and cultural knowledge that shaped participants’ understandings and attitudes about HIV and people living with HIV. The study found that assessment of basic knowledge is not sufficient. Instead, a contextual approach to understanding what people ‘know’ is essential, not only for HIV, but for the delivery of all health care education and interventions to Black African new settlers. More routine HIV education and testing, together with staff education, may increase acceptance of these interventions in Black African communities.

Specialist services for management of individuals identifying as transgender in New Zealand
John W Delahunt, Hayley J Denison, Jane Kennedy, Jackie Hilton, Heather Young, Owais B Chaudhri, Marianne S Elston

We asked endocrinology and sexual health specialists about the services they had available for people who identify as transgender and are seeking treatment. There were differences in experience between physicians. There were also differences in the provision of psychological and surgical facilities between the public and private sectors, as well as between District Health Boards (DHBs). We suggested that interested and experienced specialists from adjacent DHBs in the main regions in New Zealand combine to form ‘Multidisciplinary Teams’. They should link with other doctors and the transgender community to help develop ‘Pathways’ for care and coordinated management.
Management of postmenopausal bleeding by general practitioners in a community setting: an observational study
Monique Stravens, John Short, Karyn Johnson, Bryony Simcock, Brett Shand, Graham McGeoch, Peter Sykes
This study evaluated the effectiveness and safety of treatment provided by general practitioners to 241 women with abnormal postmenopausal bleeding. The study showed that the general practitioners were able to adequately carry out the minor surgical procedure for investigating the cause of the abnormal bleeding and to arrange appropriate treatment. However, the study identified that further training of the general practitioners would improve their ability to carry out the surgical procedure.

Artificial intelligence in medicine: humans need not apply?
William Diprose, Nicholas Buist
We believe that over the coming years artificial intelligence (AI) will perform a significant amount of the tasks traditionally performed by the doctor. Humans would continue to be an important part of healthcare delivery, but in many situations, less expensive fit-for-purpose healthcare workers could be trained to ‘fill the gaps’ where AI are less capable. As a result, the role of the doctor as an expensive problem-solver would become redundant.

Supervision for superheroes: the case for reflective professional supervision for senior doctors
Helen Austin
The practice of medicine is inherently stressful, with regular exposure to trauma and the distress of others. There is a culture in medicine that doctors should not be affected by such things, although it is well recognised that doctors have higher rates of depression, anxiety, suicide and substance abuse than the general public. Reflective professional supervision is a forum where the complexities of the interpersonal interactions that underpin the provision of healthcare can be explored in a supportive and confidential setting. It is argued that this is a process that should continue for the duration of a doctor's career, with potential benefits including enhanced job satisfaction and resilience, better workplace communication and improved interpersonal skills.
Nature and nurture: shaping New Zealand’s medical workforce

Phillippa Poole

Workforce development is a useful concept in industry, in which selection, education and training take place with the future workforce in mind. Given the cost, effort and time to produce a medical specialist, it is surprising that medicine is only recently moving towards a systemic approach to development of its workforce. In New Zealand, there are multiple stakeholders in the pipeline, not necessarily with missions aligned. Among these are universities, DHBs, Colleges, MCNZ, general practitioners and other private providers, the Ministry of Health and Tertiary Education Commission, communities, and, of course, trainees. The Medical Training Board (MTB) report of 2008 proved a significant turning point. The Board recommended an increase of 100 medical students per year across New Zealand’s two schools, Auckland and Otago, in order for New Zealand to be more self-sufficient in doctors. Shortly thereafter, the National Government doubled this to 200. Only now are the first of those students confirming their career choices and entering specialty training, with small increases in medical graduate numbers occurring each year until 2020. At the same time, there has been a major downturn in New Zealand medical graduates leaving for overseas permanently. As a consequence, house officer jobs and training positions are becoming more competitive. Additionally, there is a rapidly decreasing reliance on international medical graduates—formerly a mainstay of New Zealand healthcare delivery—particularly in regional and rural areas. Whether there will be an oversupply of New Zealand doctors remains moot, given that a large proportion of general practitioners will retire in the next 5 years, and those who replace them may seek to work fewer hours on average.

In 2009, Health Workforce New Zealand (HWNZ) was established to provide national leadership on the development of the country’s health workforce. It has oversight of the medical training pipeline, with the capacity to signal priorities and provide incentives or disincentives to ensure the workforce is fit for purpose. The MTB had emphasised the importance of generalist skills in the New Zealand context, and stated that 50% of medical graduates would be needed in primary care. HWNZ has been working with the Royal New Zealand College of General Practitioners, DHBs, and the Medical Council of New Zealand to include a community placement as part of prevocational training. Furthermore, general practice training places have increased substantially. Messages on job prospects are filtering down via websites and careers fairs, and through providers of undergraduate and postgraduate training. There are encouraging signs of an increase in interest in general practice as the first choice of career.

Medical workforce development is about more than numbers; it is also about the qualities and experiences of doctors and how these interact to produce doctors for current and future health needs. Who are our doctors? What are their aspirations and why? How and where should they be trained? What will keep them maximally productive and working where they are most needed? It is pleasing to see three papers in this issue addressing such aspects.

The first reports on a survey of the workforce in rural hospitals, and trainees in the division of rural hospital medicine (DRHM) training scheme. Building on a similar survey conducted six years ago, it contains encouraging results in workforce terms. Only two out of 28 rural hospitals
had stopped providing 24-hour care. Of the 26 remaining, 14 are in the North Island, with the largest number of rural hospital specialists in Northland. Hospitals report vacancies are far less of an issue than they were in 2009. Encouragingly, more New Zealand medical graduates are entering rural hospital medicine, with 46% of these being female, and 45% from a rural background—higher percentages than generally reported.

The authors attribute the improved situation to the new rural hospital scope and training scheme, rural origin pathways into Year 2 of New Zealand medical schools since 2004, and rural immersion options within medical programmes. Might other possible explanations be improving conditions for rural doctors relative to other specialties, or fewer job opportunities in urban centres or overseas? It’s one thing to get doctors into rural jobs—quite another to keep them there. The authors of the present study recognise the importance of recognition and support of the existing senior rural workforce. Sorting out the relative effects of background factors versus curriculum and work experiences on medical careers is challenging. This is the subject of a prospective longitudinal tracking study in Australia and New Zealand. This will provide some of the answers, but not all, underscoring the importance of repeated observational studies in specific priority areas, such the rural workforce.

A second paper proposes reflective professional supervision for all senior doctors. Written from the perspective of a forensic psychiatrist, the paper explains the concept of vicarious trauma, “an experience that many doctors may be aware of, but not be able to name.” Supervision aims to reduce the build-up of secondary traumatic stress on individuals, thus improving their interactions with patients and others, through a process that is “formative, normative and restorative.” As the author points out, communication issues are common causes for complaints. Further, there is an increased emphasis on healthy and safe workplaces, with loss of tolerance for toxic work and training cultures. The paper outlines how supervision might be incorporated, as well as barriers to systemic implementation. An assumption is that poor performance or clinical risk is related to vicarious trauma, and this is amenable to an intervention, such as professional supervision. Intuitively, this seems a good idea, but as with many good ideas, the approach needs to be shown in a medical context to be feasible, acceptable and to promote the desired changes. Nevertheless, this paper is a timely reminder that doctors are not immune from the situations they witness on a daily basis, even if they believe they are. Those of us still in the system may have a view that is distorted by survivor bias, yet may be working sub-optimally. This paper reminds us, as have others, that the health of doctors is an important, yet under-emphasised, measure of health system function.

Medical students are our junior colleagues and doctors of the future. The disastrous Christchurch earthquakes in 2010 and 2011 provided an opportunity for university staff to study predictors of resilience in Christchurch-based students who were in the final 3 years of their programme. Using an outcome measure of self-rated resilience scored on a validated scale, they found a range of factors, including student seniority, personality and mental health; a lack of exposure to the most severe earthquake; and feeling supported post-earthquake, associated with greater resilience. Many other factors were unrelated. Taken together, the authors’ model explained about a third of the variance in resilience scores. Obviously such unpredictable events are rare, although extreme weather or large-scale terrorism events follow a similar power law. Major external crises will arise and systems must be prepared to deal with them. Thus, there is considerable generalisability to the finding that institutional response is an important component of support. More controversial is whether or not information about an individual’s personality or mental health status ought to be known in advance so as to better target support efforts post event. The authors believe this would be a step too far, and I’d agree. A prospective follow-up study might give important insights as to the burden of such events in the long run, what was most helpful, and how it is best provided.

Ideally, New Zealand medical school classes would be comprised of individuals who reflect the community, with the passion and ability to complete medical training, and go on to deliver quality care for a
working lifetime. Each cohort would be predisposed by the range of backgrounds and subsequent experiences to enter the broad spectrum of medical roles needed by communities across New Zealand. However, students and doctors are agents in complex organic systems which continually adapt and feedback upon those in the system. Actions in one part have positive and negative consequences, sometimes major, in other parts of the system. The authors of these three papers shed light on individual and system factors that may help or hinder medical workforce development in New Zealand. Such evidence reminds individuals and institutions along the pipeline that every medical job is important, as is every doctor, and a little care of our workforce goes a long way.

**REFERENCES:**


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The New Zealand Rural Hospital Doctors Workforce Survey 2015
Ross Lawrenson, James Reid, Garry Nixon, Andrew Laurenson

ABSTRACT
AIMS: The aim of the study was to assess medical workforce needs of New Zealand rural hospitals.
METHODS: We undertook a survey of all the managers of rural hospitals in New Zealand. We also analysed the Medical Council data relevant to doctors with a vocational scope of rural hospital medicine, followed by online surveys of rural hospital doctors and registrars in training.
RESULTS: There were 26 rural hospitals identified. 18/26 (69%) directly employed medical staff. Managers identified a shortage of rural hospital doctors, although this was much improved compared to 2009. While most vocationally registered doctors working in rural hospitals were older, male and predominantly international medical graduates, we found that registrars in training were more likely to be female, from a rural background and to have trained in New Zealand. Seventy-five percent of rural trainees are either trained in general practice or are pursuing dual training.
CONCLUSIONS: This study provides useful information for rural hospital managers, clinical leaders and others involved in workforce planning. While there has been a reduction of the workforce shortages of a few years ago, there are still shortages for many hospitals. The new cadre of trainees are more likely to be female and are looking to be rural generalists.

Concerns have been held about the state of New Zealand’s rural hospital medical workforce for a long time.1,2,3 The seriousness of the situation was confirmed in the first formal workforce survey undertaken in 2009.4 At that time, a third of the medical staff positions were found to be vacant or filled by locums, and 75% of the hospital managers described a serious/critical shortage of suitably qualified medical staff. The survey also noted a lack of clinical leadership and poor uptake of processes designed to maintain standards of professional practice, such as credentialing and clinical governance.

After an inaugural meeting in 2005, the Division of Rural Hospital Medicine (DRHM) was formed under the auspices of the Royal New Zealand College of General Practitioners,5 and the first trainees were accepted onto the new rural hospital medicine training scheme in 2009. Although a new scope of practice, rural hospital medicine was recognised by the Medical Council of New Zealand (MCNZ). The intention was to build on the close ties with rural general practice by—amongst other things—integrating the maintenance of professional standards (MOPS) programmes and aligning the DRHM and general practice training schemes.6

It is still too early to determine the impact these initiatives will have on the workforce in the long term. However, by repeating the survey done in 2009 it was intended changes could be observed and information gathered that would inform future workforce planning and integration with other RNZCGP programmes.

Aims and objectives
The aims of the study were to:
1. assess medical workforce needs of New Zealand rural hospitals; and
2. assess the characteristics and intentions of registrars within the DRHM program.
Methods

We undertook three cross sectional studies.

1. A survey of all the rural hospitals. A rural hospital was defined for this study as one which offered acute care and provided 24-hour medical cover in line with the definition used in our 2009 survey. We also used the same questionnaire. We did add in questions about the use of doctors working in the new vocational scope of rural hospital medicine. All the managers of the identified rural hospitals were contacted and helped complete the questionnaires.

2. We obtained the list of the doctors currently registered with the MCNZ as being vocationally registered in rural hospital medicine. We identified in this group their country of qualification, the university they qualified from, the year of qualification and their gender.

3. We surveyed rural hospital doctors including Fellows, registrars in training and non-vocationally registered doctors. We invited all DRHM current Fellows and registrars to complete an online survey. This survey was developed in conjunction with the RNZCGP Division of Rural Hospital Medicine. The questionnaire developed for registrars included questions specific to their training experience which we are not reporting in this study. The questionnaires were formatted into a Survey Monkey electronic tool and placed on the College website. All Fellows and registrars were invited to complete the questionnaire. Invites were also made on e-pulse, the RNZCGP e-newsletter, and personal contacts from key members of the DRHM. We also developed a shorter questionnaire based on key questions for the DRHM Fellows, aimed at doctors working in rural hospitals, but who were not Fellows of the DRHM. This questionnaire was hosted by the New Zealand Institute of Rural Health. Doctors were invited by word of mouth via the hospital managers and DRHM Fellows to complete this questionnaire.

Results

Survey of rural hospital managers

We surveyed 26 hospitals (two less than in 2009) between January and March 2015: 16/26 (61.5%) were managed by District Health Boards, and the remainder were managed by a range of community organisations, including community trusts, an Iwi organisation, and a Local Authority Trading Organisation; 12/26 (46%) are approved for DRHM training. The mean number of beds was 16 (3–48), excluding maternity beds and residential care beds. The 2015 findings are compared with those of 2009 in Table 1. Seventy-seven percent (14/18) of hospitals that employed medical staff directly said they had a process for checking doctors credentials, and 21/26 (81%) said they had an active process of clinical governance.

Survey of MCNZ records of doctors who are vocationally registered in rural hospital medicine

We identified 92 doctors vocationally registered in rural hospital medicine by MCNZ. 26/92 (28%) were female and 36/92 (39%) received their primary degree in New Zealand.

Thirty-three percent (12/36) of New Zealand medical graduates graduated from the University of Auckland, and 24/36 (67%) from Otago. Fifty-eight percent (53/92) were vocationally registered in another scope: 37 (40%) were vocationally registered in general practice; 13 (14%) in Urgent Care; 3 in emergency medicine; and one each in internal medicine and paediatrics. (nb, some were vocationally registered in more than one additional scope). The median year of qualification was 1988.

Survey of Rural Hospital Doctors

DRHM current Fellows

The DRHM identified 110 Fellows on their membership list. There were 3 doctors on MCNZ database no longer reporting their MOPS in the DRHM scope, and 21 Fellows who have not registered their qualification with the MCNZ. Five of these doctors are not registered with the MCNZ—possibly as they are working overseas or taking a break from working. However, there are 16 Fellows who are active, but not vocationally registered according to the MCNZ.
ARTICLE

Sixty-two percent (68/110) of DRHM Fellows provided a valid response to the electronic questionnaire: 25/68 (37%) were female (compared to 28% of MCNZ list); 32/68 (47%) received their primary degree in New Zealand (compared to 39% of MCNZ sample); and of the New Zealand graduates, 30% graduated from the University of Auckland, compared to 33% in the MCNZ sample. These comparisons suggest that the sample is slightly biased to New Zealand-qualified doctors, Otago graduates and females. Median age group of Fellows was 45–54 years. Data regarding the number of survey respondents who come from a rural background (defined for the purpose of this survey as living rurally and attending school in a community with a population of less than 30,000 at the time of entry to medical school) shows that the proportion of current DRHM Fellows who come from a rural background is 21/67 (31%).

Additional scopes
Sixty-five percent (44/68) of respondents held a vocational registration in another scope, compared to 58% on the MCNZ register. Again, the most common scope is general practice (37%), followed by Urgent Care, and emergency medicine. An additional 18% are practising outside their vocational scope under a general scope, either in emergency medicine, general practice, or internal medicine. Fifty-one percent (35/68) have recently been registered to work in another country.

Employment
Eighty-eight percent (60/68) of Fellows work in rural hospitals: 44% work in a Level 3 rural hospital; 35% in Level 2; and 9% in Level 1. Only 28% work at a single worksite rural hospital, while 72% work at two or more workplaces, with some having three or more worksites. Northland DHB employs the greatest number of Fellows, followed by Canterbury, Southern, Waikato and West Coast DHBs.

Clinical responsibilities
The majority of Fellows (50/68 (73.0%)) have daily responsibility for adult acute medicine. Fewer than half have daily responsibility for paediatric acute medicine (47.6%), convalescent care (41.3%), long-stay inpatient care (31.7%), or palliative care (44.4%), but all of these areas are covered occasionally or out-of-hours. Fifty-two percent of Fellows indicate that they never have lead maternity carer responsibilities. However, 66.2% are involved as support for midwifery colleagues in an emergency.

Clinical governance
There was good agreement between the reports from medical staff and the hospital managers, with 80% rural hospital doctors saying that there is active clinical governance in their worksite, and 73% identifying there was clinical leadership—although this may be provided from a base hospital.

Future
Sixty percent of respondents said it was very easy, or moderately easy, to find employment in rural hospital medicine. Thirteen percent (9/68) are considering obtaining fellowship in general practice. A total of 33/64 Fellows (51.6% of the respondents to this question) have indicated that they are intending to leave rural practice in the next 10 years. Five of these respondents (7.8%) are intending to leave in the next 2 years, 10 in the next 5 years (15.6%), and a further 18 in the next 10 years (28.1%). Of those planning to leave, retirement is given as the reason in 21 cases (32.8% of respondents, or 63.6% of those planning to leave rural practice).

Table 1: A comparison of the findings from the survey of rural hospital managers in 2009 and 2015.

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<tr>
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<th>2015 survey (26 hospitals)</th>
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<tr>
<td>DHB managed facility</td>
<td>19/28 (68%)</td>
<td>16/26 (61%)</td>
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<td>Directly employed medical staff</td>
<td>18/28 (64%)</td>
<td>18/26 (69%)</td>
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<td>Budgeted FTE Medical staff</td>
<td>85.1</td>
<td>96.8</td>
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<td>Locums/unfilled positions</td>
<td>27 (32%)</td>
<td>5.5 (5.7%)</td>
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<tr>
<td>Serious/critical shortage of suitably qualified medical staff</td>
<td>18/26 (75%)</td>
<td>6/23 (26%)</td>
</tr>
<tr>
<td>Designated medical leader</td>
<td>18/28 (64%)</td>
<td>19/26 (73%)</td>
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DRHM registrars survey results

Response rate for the Registrar survey was 42 out of a College list of 46 active registrars, a 91% response. Median age group of Registrars was 25–34 years (81%). The majority graduated in 2005–2009 period. Data regarding the number of survey respondents who come from a rural background showed almost one in two registrars (45%, 19 out of 42 respondents) came from a rural background, 46% were female, and 71% had primary degree in New Zealand, with the remainder mainly coming from the UK. Sixty-three percent of New Zealand graduates trained at the University of Otago. Sixty-three percent are on a dual training pathway with general practice, and 12% already hold vocational registration in general practice.

Employment

Twenty-six percent (11/42) said they were currently working in a rural hospital, mainly Level 3 hospitals (nb, Grey Hospital is considered a Level 3 hospital for DRHM training but was not considered in the rural hospital survey). Data regarding current registrar employment shows that there are a limited set of runs that registrars are currently engaged in. These are anaesthetics, emergency medicine, general medicine, paediatrics, rural general practice, rural hospital, and urban general practice. Registrars reported some difficulty in finding runs in paediatrics and anaesthetics. No registrars reported having taken a run in O&G or palliative care.

Registrar’s future intentions

Of the registrars that responded to the survey, 33% intend to work in rural hospital practice only, while 61.5% said they intend to work in a combination of rural hospital medicine and general practice. Five percent are intending to work in rural general practice only, and 34% intend to work overseas at the end of their training.

Non-vocationally registered doctors survey results

There were 11 eligible responses from non-vocationally registered doctors who were currently working in a rural hospital. The median age distribution of non-vocationally registered doctors was 33–44, intermediate between the age of registrars and Fellows. Five were female (45%), one was a New Zealand graduate, three were from the UK, and six from Europe.

Discussion

This workforce survey took a dual approach—the first from the perspective of the rural hospital’s management, and the second that of the doctors working within the sector. We used the same definition of a rural hospital as that used in the 2009 survey, and identified 26 centres that provided 24-hour hospital care, had generalist medical cover and did not have more than two vocationally registered specialists. Akaroa and Taihape were both included in 2009, but are no longer providing acute hospital care for their communities.

Our survey of rural hospitals suggests that there is a much-improved workforce situation compared to 2009, with more medical positions, and with the percentage of positions filled by locums or vacant, falling from 32% to 5.7%. Most doctors working in a rural hospital are now vocationally registered or are in training. Thirty percent of the hospital managers indicated that there is an adequate supply of rural hospital doctors, although a quarter indicated there is still a serious or critical shortage. The World Health Organization identifies the importance of educational, financial, professional, personal and regulatory initiatives to improve access to health workers for rural communities. The DRHM training program provides vocational training and a career path for trainees, and is likely to have contributed to this improved position. A number of other initiatives also need to be recognised, including those from the two medical schools, and MCNZ. These include the introduction of the Rural Origin Medical Preferential Entry (ROMPE) scheme in 2002. The role of a rural background in helping redress the maldistribution of the medical workforce has long been espoused, although why the rural background effect occurs is not fully explained.

There is also some evidence of the benefit of the undergraduate rural immersion programs at the two New Zealand medical schools (the role of rural placements and the postgraduate general practice placement program) in
attracting young New Zealand graduates to the rural workforce. It is good to note the proportion of registrars in our study from a rural background is greater than the proportion of Fellows, and most had qualified between 2005 and 2009, therefore ROMPE and these other initiatives may well be having an impact.

The findings from both hospital managers and Fellows are consistent and suggest more than 70% can identify a clinical leader for their hospital. This has improved since 2009, and anecdotally it seems that achieving a vocational specialist registration has allowed more doctors to take up these roles as independent specialists who are able to lead the services. However, as with the rest of the New Zealand health system, more could be done to strengthen the partnership between management and clinical service delivery. It is also good to see that there is generally some credentialing of new doctors before they start work—again a simple, but useful, way of ensuring the quality of medical care being provided. It has been suggested that rural communities can expect a second-class level of practitioner, but a credentialing process ensures that only suitably qualified and experienced doctors are recruited to any vacant position. This should be especially important for locums, but also a rigorous process is required for substantive positions.

Although there has been a small increase in the number of medical positions available in rural hospitals, the actual number of available doctors is similar to the 107 we identified in 2009. The characteristics of the doctors are different, with most having gained extra qualifications since then. However, most Fellows are still in the 45–54 year age bracket, are male, and were trained overseas. This study shows again that rural New Zealand is highly dependent on an overseas-trained workforce. Retention of this international workforce depends on the appropriate organisational support, and should not be forgotten while we are actively “growing our own”. It is pleasing to see the rural hospital medicine doctors coming through are mostly New Zealand graduates, and with an increasing proportion of women. This shows that there will be a younger, more diverse and New Zealand-trained workforce available to replace older Fellows as they retire from practice. It is important that the positions remain attractive with reasonable rostering, a female-friendly work environment that allows opportunities for part-time work, or for breaks from practice for family reasons.

We also noted in our previous survey that most rural doctors are not able to access non-clinical time. It is necessary that rural hospital doctors are treated equitably, whether they work for a DHB or a community trust. We have noted that most rural hospital doctors practice at more than one workplace, many have additional vocational qualifications and many of the registrars are training in both rural hospital medicine and general practice. It is evident that through combined training the New Zealand College is helping to develop the rural generalist promulgated following the inaugural World Summit on Rural Medical Generalist Medicine held in Cairns in 2013. Two other issues that we have highlighted concern training in obstetrics and palliative care. We have shown that many rural hospital doctors provide support for midwifery, but have not been accessing training in this field. A study from Otago highlighted the professional isolation of midwives from general practice and given that many rural hospitals also have a rural maternity annex means that the role of the rural generalist in midwifery needs clarification. A second issue is palliative care. It is uncertain why no registrars have undertaken a palliative care run, as 44% of Fellows reported they provide cover for palliative care patients. It is predicted that the need for palliative care services will only increase, and it would be good for the specialist palliative care services to discuss with the DRHM how they can better facilitate the training of registrars.

The scope of rural hospital medicine is defined by its context, and in particular the MCNZ definition of a rural hospital. It is clear from the survey that a number of Fellows are filling positions in larger hospitals, in particular small provincial hospitals, such as Grey Base and Wairau. These doctors are “working out of scope” and currently need a collegial relationship. Because the role of DRHM fellows in this context is still unclear, it is difficult to determine the future size of the workforce.
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Resolving the MCNZ registration issues for these doctors would be a helpful first step. Overall, we believe this study provides useful information for rural hospital managers, clinical leaders and others involved in workforce planning. While there has been a reduction of the workforce shortages of a few years ago, we still need to be vigilant and ensure that more doctors enter the DRHM pathway. It would seem that the shortage of rural general practitioners is also being helped by the dual pathway that many registrars have taken up. The College has to be commended for the way it has supported the work of the DRHM, and at the same time seen the benefits of having a rural GP workforce who are better equipped to provide expert acute medical care.

Overall, it appears that the DRHM have a training program that is proving attractive to trainees and will help ensure rural communities will have a well-trained workforce for the future.

Appendix

Rural Hospitals included in the Study (Number: 26)
Two hospitals from the 2009 survey were not included: Akaroa, which was closed after the Canterbury earthquake and has not re-opened; and Taihape, which the MidCentral DHB transferred to a Community Trust, who then found the hospital unsustainable.

- Ashburton Hospital
- Bay of Islands Hospital
- Buller Hospital
- Chatham Islands Hospital
- Clutha Health First
- Dannevirke Community Hospital
- Dargaville Hospital
- Dunstan Hospital
- Golden Bay
- Gore Hospital
- Hawera Hospital
- Hokianga Hospital
- Kaikoura Hospital
- Kaitaia Hospital
- Lakes District Hospital
- Maniototo Hospital
- Murchison Hospital and Health Centre
- Oamaru Hospital
- Opotiki Hospital
- Taumarunui Hospital
- Taupo Hospital
- Te Kuiti Hospital
- Te Puia Hospital
- Thames Hospital
- Tokoroa Hospital
- Wairoa Hospital and Health Centre
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Competing interests:
Ross Lawrenson is a Board Member of the New Zealand Rural General Practice Network and the Pinnacle Group Ltd.

Acknowledgements:
We would like to thank: Health Workforce New Zealand (HWNZ) for their funding of this survey; Pam Watson from RNZCGP for the organisation of the Fellows and Registrar surveys; Robin Steed and Brent Nielsen from NZIRH for conducting the survey of rural hospitals; and all the doctors and hospital managers who have participated.

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Predictors of psychological resilience amongst medical students following major earthquakes


ABSTRACT

AIM: To identify predictors of self-reported psychological resilience amongst medical students following major earthquakes in Canterbury in 2010 and 2011.

METHODS: Two hundred and fifty-three medical students from the Christchurch campus, University of Otago, were invited to participate in an electronic survey seven months following the most severe earthquake. Students completed the Connor-Davidson Resilience Scale, the Depression, Anxiety and Stress Scale, the Post-traumatic Disorder Checklist, the Work and Adjustment Scale, and the Eysenck Personality Questionnaire. Likert scales and other questions were also used to assess a range of variables including demographic and historical variables (eg, self-rated resilience prior to the earthquakes), plus the impacts of the earthquakes.

RESULTS: The response rate was 78%. Univariate analyses identified multiple variables that were significantly associated with higher resilience. Multiple linear regression analyses produced a fitted model that was able to explain 35% of the variance in resilience scores. The best predictors of higher resilience were: retrospectively-rated personality prior to the earthquakes (higher extroversion and lower neuroticism); higher self-rated resilience prior to the earthquakes; not being exposed to the most severe earthquake; and less psychological distress following the earthquakes.

CONCLUSION: Psychological resilience amongst medical students following major earthquakes was able to be predicted to a moderate extent.

Psychological resilience refers to positive adaptation, or the ability to maintain or re-gain mental health, despite adversity.1 In 2010 and 2011, the region of Canterbury, New Zealand, encountered adversity in the form of a series of powerful earthquakes and aftershocks. Seven months following the most severe earthquake (February 2011), medical students from the Christchurch campus, University of Otago, were surveyed. The present study aims to identify predictors of self-reported psychological resilience amongst these medical students.

Method

The study method, sample characteristics, and general psychological functioning of the sample are described in full elsewhere.2 The study was approved by the University of Otago Ethics Committee.

Participants

All 253 medical students (registered from November 2010) from the Christchurch campus, University of Otago, were emailed inviting them to participate in an electronic survey asking them about their experiences relating to the earthquakes. Students were in their 4th, 5th or 6th year of study. Surveys were sent out in September 2011, seven months after the most severe earthquake.

Measures

Primary outcome measure

Current, self-rated resilience as measured by the Connor-Davidson Resilience Scale3 was the primary outcome measure in the present study. This scale has been identified as having superior psychometric scales to many other resilience scales,4 and has been used to evaluate resilience following earthquakes in China5-7 and Turkey.8
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Predictor measures
A range of pre-earthquake, peri-earthquake, and post-earthquake factors potentially associated with resilience or psychological distress were assessed:

- Demographic measures (gender; age; relationship status; ethnicity; years living in New Zealand; and year of medical training).
- Historical measures (self-reported mental health problems prior to the earthquakes, yes/no; self-reported physical health problems prior to the earthquakes, yes/no; retrospectively-rated resilience prior to the earthquakes, Likert scale 1–5; and retrospectively-rated personality prior to the earthquakes; Eysenck Personality Questionnaire, brief version).
- Exposure to earthquakes (total number of significant earthquakes exposed to, 0–3; and exposure to the most severe earthquake, February 2011, yes/no).
- Adverse impact of earthquakes on living arrangements, course provision and/or study resources, and finances (at worst and currently for each, Likert scales 0–3).
- Feeling burdened by obligations to others (Likert scale 1–5).
- Total perceived support (University + clinical placements + people in life in general; Likert scale 1–5).
- Feeling safe living, and feeling safe working, in Christchurch (Likert scales 1–5).
- Psychological distress, as measured by:
  - Depression, Anxiety and Stress Scale (DASS).3
  - Post-traumatic stress checklist.10
  - Alcohol misuse (Likert scale 0–3).
- Self-reported mental health problems since the earthquakes (yes/no).
- Self-reported physical health problems since the earthquakes (yes/no).
- Problems with functioning since the earthquakes (Work and Adjustment Scale).11

A past history of abuse and/or trauma was not assessed.

Statistical analyses
Some measures were not normally distributed or contained very low numbers in some categories. For these reasons, the following variables were dichotomised: years living in New Zealand (less than 10 years, or 10 years or more); ethnicity (New Zealand European yes/no); in a relationship (yes/no); and alcohol misuse (yes/no). Where feasible, some measures were combined to yield a summary variable, in order to reduce the total number of univariate analyses that were performed. For example, ‘support’ (University + clinical placements + people in life in general) and ‘DASS total’ (depression + anxiety + stress subscales).

The above predictor measures were formulated as occurring either pre-earthquake, peri-earthquake, or post-earthquake. First, univariate analyses were conducted to identify candidate variables for inclusion in subsequent modelling. This was done by identifying predictor variables that were significantly (p =<0.05) associated with resilience in univariate analyses. Second, these statistically significant predictors were examined using a multiple linear regression analysis to identify which combination of variables was best able to predict resilience. Additional post-hoc analyses were undertaken comparing each of the predictors identified in the multiple linear regression, to identify which variables were the strongest predictors of resilience. Throughout the paper, significance was determined using p =<0.05.

Results
Response rate and demographics
Of the 253 medical students who were invited to participate in the survey, 210 completed the survey and 198 endorsed the item giving consent for the study and reported which year of the medical course they were currently in. Analyses reported in this paper involve these 198 students (198/253 = 78%).

Mean age for the medical students was 23.5 years (SD 2.1, range 20–33 years), 61.9% were female, 74.6% had lived in New Zealand for 10 years or more, and 53.0% were single. Fifty-six percent indicated being New Zealand European, and the 43.9% who did not indicate being New Zealand European.
Zealand European were from a range of ethnic backgrounds (Chinese, other, Malay, Māori, Middle East, Indian and Samoan; ordered from most common category to least common category). The 198 participants were in their 4th (n=66), 5th (n=77) or 6th (n=55) year of training. In a previous paper, we reported that students in their 6th year of study were significantly more likely to be women.

Univariate analyses
Univariate analyses were conducted using independent t tests*, one-way analysis of variance ∆ or Pearson correlations ‡. Significance was determined using p =<0.05, however findings where p =<0.01 are listed first and shown in bold.

Pre-earthquake variables
The following predictor variables were significantly associated with higher resilience scores on the Connor-Davidson Resilience Scale (ie, being more resilient):

- Personality (Eysenck Personality Questionnaire) prior to the earthquakes ‡ (higher extraversion [Pearson correlation = 0.39, p<0.001] and lower neuroticism [Pearson correlation = -0.38, p<0.001]).
- More resilient prior to the earthquakes ‡ (Pearson correlation = -0.40, p<0.001).
- Absence of mental health problems prior to the earthquakes * (t =3.1, df = 164, p=0.002).
- Female gender* (t = -2.3, df = 164, p=0.03).
- New Zealand European ethnicity* (t = -2.4, df = 165, p=0.02).
- Living in New Zealand for 10 years or more* (t = -2.1, df = 165, p=0.04).
- Year of medical training* (6th-year students significantly more resilient than 5th-year students; F=4.3, p=0.02).

Age † and physical problems prior to the earthquakes* were not significantly associated with resilience.

Peri-earthquake variables
The following predictor variable was significantly associated with higher resilience scores on the Connor-Davidson Resilience Scale (ie, being more resilient):

- Not being exposed to the most severe earthquake, February 2011* (t =2.9, df = 164, p=0.005).

Total earthquake exposure (0–3 significant earthquakes) †, and adverse impacts at worst (living arrangements, course provision and/or study resources, and finances) † were not significantly associated with resilience.

Post-earthquake variables
The following predictor variables were significantly associated with higher resilience scores on the Connor-Davidson Resilience Scale (ie, being more resilient):

- Feeling more supported (University + clinical placements + people in life in general; † Pearson correlation = 0.23, p=0.003).
- Experiencing fewer current mental health problems as assessed by:
  - DASS total ‡ (Pearson correlation = -0.38, p=0.003).
  - Post-traumatic checklist total ‡ (Pearson correlation = -0.23, p=0.003).
- Mental health problems since the earthquakes * (t =3.1, df = 164, p=0.002).
- Feeling less burdened by obligations to others † (Pearson correlation = -0.18, p=0.02).

Relationship status*, current adverse impacts (living arrangements, course provision and/or study resources, and finances) †, not feeling safe living in Christchurch †, not feeling safe working in Christchurch †, alcohol misuse*, physical problems since the earthquakes*, and problems with functioning (Work and Adjustment Scale) ‡ were not significantly associated with resilience.

Multiple linear regression analysis
The statistically significant (p<0.05) predictors identified through the univariate analyses were entered into a multiple linear regression analysis in blocks (predisposing variables, precipitating variables and perpetuating variables). At each block entry, methods of forward and backward variable elimination were used to arrive at a set of stable and parsimonious predictors. The final fitted model produced an R-square of 0.35. The following variables significantly
(p<0.05) contributed to the final fitted model (ordered from strongest to weakest):

- Extraversion (Eysenck Personality Questionnaire; β=0.28). Higher levels of retrospectively self-rated extra- version prior to the earthquakes predicted higher levels of resilience.
- DASS total (β=0.23). Less distress predicted higher levels of resilience.
- Resilience prior to the earthquakes (β=0.14): Higher levels of self-rated resilience prior to the earthquakes predicted higher levels of resilience.
- Earthquake exposure (β=-0.14): Not being exposed to the most severe earthquake, February 2011, predicted higher levels of resilience.
- Neuroticism (Eysenck Personality Questionnaire; β=-0.14). Lower levels of retrospectively self-rated neuroticism prior to the earthquakes marginally predicted higher levels of resilience.

Additional post-hoc analyses (using an F-test) comparing each of the predictors identified through multiple linear regression analysis were undertaken. These confirm the hierarchy of effects described above.

**Discussion**

The present study aimed to identify predictors of resilience amongst medical students following a series of major earthquakes. The survey was sent out seven months following the most severe earthquake, and a response rate of 78% was achieved. Being more resilient, as measured by the Connor-Davidson Resilience Scale, was significantly (p<0.05) associated with the following variables, using univariate analyses.

**Pre-earthquake variables**

Retrospectively self-rated personality prior to the earthquakes (being more extroverted and less neurotic), more resilient (retrospectively self-rated) prior to the earthquakes, female gender, New Zealand European ethnicity, living in New Zealand for 10 years or more, year of medical training (being a 6th-year versus a 5th-year student), and the absence of self-reported mental health problems prior to the earthquakes.

**Peri-earthquake variable**

Not being exposed to the most severe earthquake (February 2011).

**Post-earthquake variables**

Feeling more supported, experiencing less self-reported mental health problems following the earthquakes, and feeling less burdened by obligations to others.

Consistent with previous studies, the present study found that resilience was associated with multiple factors when univariate analyses were performed. Many of the variables that were significantly associated with resilience are not easily amenable to change (eg, demographic factors and earthquake exposure). However, this does not necessarily mean that resilience is static. For example, fifth-year medical students were significantly less resilient than sixth-year students. Fifth-year students had more earthquake exposure, and were arguably under considerably more pressure as their final major set of examinations occur at the end of their fifth year. Feeling more supported following the earthquakes was associated with higher resilience. Taken together, these findings suggest that resilience may be dynamic, although the present study did not set out to evaluate this issue.

Previous studies have reported that ethnic minority status is associated with increased psychological risk following trauma, which is broadly consistent with the present finding that students who were not from the majority ethnic group, and had lived in New Zealand for less than 10 years, were less resilient. Consistent with previous studies, we found that resilience was positively associated with extroversion and negatively associated with neuroticism. Inconsistent with a previous similar study, the present study found that female gender was significantly associated with higher resilience. However, female students were also significantly more likely to be sixth-year students, which in itself was associated with higher resilience (ie, both female gender and being a sixth-year student were associated with greater resilience on univariate analyses).

A disadvantage of univariate analyses is that they do not account for inter-correlations amongst variables, and potentially
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lead to a type-1 error being made due to multiple comparisons (ie, incorrect rejection of the null hypothesis). In the present study, the purpose of the univariate analyses was to identify candidate variables for inclusion in statistical modelling. A multiple linear regression analysis was performed to identify the most parsimonious predictors of resilience, and post-hoc tests were performed to confirm which variables were the strongest predictors of resilience. The final fitted model was able to explain 35% of the variance in resilience scores. The following variables contributed to the final fitted model:

- Personality (higher extroversion and lower neuroticism). Educational institution unlikely to know this.
- Higher resilience prior to the earthquakes. Educational institution unlikely to know this.
- Not being exposed to the most severe earthquake. Educational institution likely to know this.
- Lower levels of psychological distress (DASS total). Educational institution unlikely to know this for most students, unless they ask.

While resilience was associated with less psychological distress, resilience was not simply the converse of psychological distress. Lack of psychological distress by itself, did not fully account for resilience. Personality and lack of exposure to the most severe earthquake, in combination with a lack of psychological distress, provided the best prediction of resilience.

In a previous report on the same sample, we identified predictors of psychological distress (DASS total). The only variable that predicted both psychological distress and resilience was neuroticism. High neuroticism predicted psychological distress, and low neuroticism predicted resilience. However, in the present study, neuroticism was of marginal predictive value in the final fitted model, and was the weakest of the final five variables in predicting resilience. No known other studies have examined predictors of resilience amongst medical students using modelling techniques.

The results from the statistical modelling in the present study may seem somewhat sobering from the perspective of an educational institution. The variables associated with resilience were either already ‘set’ (personality and resilience prior to the earthquakes), were not able to be prevented (exposure to most severe earthquake), or may not be known by an educational institution unless they went out of their way to find out (current level of psychological distress). The latter would be able to be assessed though. It seems likely that there are no easy answers for educational institutions regarding how they could better select students in terms of resilience. While it would be possible to select medical students on the basis of their personality profile (higher extroversion) and resilience scores (higher levels of baseline resilience), these self-report measures would be highly vulnerable to students simply learning ‘what they needed to say’ to get into medical school. Instead, the present study suggests that educational institutions should expect to have limited control over whether students are resilient or not, and should be prepared to provide support to those who are less resilient and need help.

Limitations with the present study include the retrospective nature of the assessment of some variables (personality, resilience prior to the earthquakes and health problems), and the reliance on self-report data. The response rate in the present study (78%) is adequate, but a higher rate would have been desirable. While it was necessary to dichotomise some variables due to low responses in some categories (eg, some ethnic groups), it is possible that some relevant predictor variables were not included in the analyses.

Conclusion

Psychological resilience amongst medical students following major earthquakes was able to be predicted to a moderate extent.
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Competing interests:
Nil

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Understanding Pasifika youth and the obesogenic environment, Auckland and Wellington, New Zealand

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ABSTRACT

AIM: In New Zealand, the burden of obesity is greatest among Pacific people, especially in children and adolescents. We investigated the factors of the obesogenic environment that were indigenous to Pasifika youths’ social-cultural context, their food purchasing behaviours, and associated anthropometric measures.

METHODS: An exploratory study of 30 Pasifika youth aged 16–24 years in Wellington and Auckland, New Zealand.

RESULTS: A large proportion of the participants were obese (mean body mass index: 31.0 kg/m\(^2\); waist-to-hip ratio: 0.84; waist-to-height ratio: 0.6), suggesting that the future health and wellbeing trajectory of the studied Pasifika youth is poor. Purchasing behaviours of food and snacks over a 7-day period provided meaningful insights that could be a useful future research tool to examine the role of their physical environment on food access and availability.

CONCLUSIONS: From this exploratory study, we highlight the following: (i) the future health trajectory of Pasifika youth is poor. Developing the youths’ healthy lifestyle knowledge may lend itself to developing culturally relevant intervention programmes; (ii) identifying the enablers and barriers within the Pasifika context of an obesogenic environment can provide very useful information; (iii) use of spatial analysis using purchased food receipts adds to the current knowledge base of obesity-related research, although this was an exploratory investigation. We need to address these highlights if we are to reverse the trend of obesity for this population.

On a global scale, obesity is the single biggest risk factor contributing to poor health outcomes, reduced quality of life, increased health care costs and is a major contributor to chronic disease and disability (eg, type 2 diabetes mellitus).\(^1\) New Zealand has one of the highest obesity rates in world. Three in ten adults (aged 15+ years), or 31% of the total population of New Zealand were obese (ie, having a body mass index (BMI) kg/m\(^2\) >30).\(^2\) Pacific people residing in New Zealand have the highest prevalence of obesity based on the BMI definition (68%), and within the adolescent age group (15–24 year olds), 21% were classified as being obese, and the rate increases with age.\(^3\) Thus, in New Zealand, obesity disproportionately affects Pacific people, compared to the general population. Pacific people comprise approximately 7% of the total population in New Zealand.\(^3\) Much of the previous work has been conducted among older Pacific people, who have established high risk factors for a range of medical conditions such as stroke, cardiovascular disease, and type 2 diabetes mellitus, for which obesity is a risk factor. However, there is a growing amount of work conducted among adolescents and youth, who span a wide age range (aged 8–22 years).\(^4,6\) There is scant research that has focused on young Pacific people in the 16–24 year age group, who comprise 19% of the total Pacific population.\(^7\) For this paper, aligned to the New Zealand Census data, we have defined youth according to the 16–24-year-old range. This is an important age group, because they have the...
independence and capacity to understand their own, as well as their families, social realities, and if given the opportunity, they could make a unique contribution to addressing issues relating to their social and cultural environment, which may have an important impact on pathways contributing to obesity. In this paper, we proposed to take a social-ecological approach examining obesity that includes environmental influences, which has been defined, according to Swindburn and Eggers (1999), as: “the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations”. The current study focused specifically on the social (including parts of the ecological), cultural and historical pathways, where the biggest gap in the knowledge base was recognised.

Previous research has examined how social changes could affect the health and well-being of young people aged 13–18 years, in particular, the role of ‘family meals’. Results from the Youth’07 Survey highlighted similar findings from international evidence, that shared family meals provide: opportunities for building family relationships; consumption of healthy food; and protection against indicators of depression or risk-taking behaviours. Approximately 30% of Pacific adolescents reported infrequently sharing meals with their families, compared to 20% of European adolescents, and this was partially explained by economic deprivation. However, the national survey results do not provide any mechanisms for understanding how, when, and why, or the number of shared meals required, in order to promote better health and well-being, and protection against obesity. The survey is also limited in understanding the Pacific culture of food and family structure (for example, traditionally, Pacific children tend to eat separately from the adults). Few reported studies have investigated the role of the social-cultural determinants of the obesogenic environment, which is defined as; “physiological, behavioural, and environmental factors such as social marketing strategies of persuasive and pervasive food, that drive the obesity environment”. To our knowledge, there is limited data on the social-cultural determinants (eg, social-peer interactions and support, family relationships, racism and discrimination) of overall health and well-being in relation to socio-economic position, cultural nativity, and acculturation, particularly in the 16–24 year-old age group, and among young Pacific people. Social-cultural determinants were highlighted by Durie, as well as others, as playing a potentially important role having some causal basis in the acculturation process.

Arguably, if the biological risk factors were the only drivers of ethnic differences in all-cause mortality, then Pacific people should have the highest mortality rates. For the most part, investigating Pacific culture and its benefits on health is necessary, but it is often defined and investigated differently, thus making comparisons between studies difficult. Exploring culture and health encompassed in a broader social-ecological spectrum (eg, indigenous knowledge), may provide important information that can point to innovative ideas for intervention, be culturally acceptable for a specific age group, and actionable in relation to policy development and implementation. Indigenous knowledge encompasses life experiences developed over generations and include: culturally coded ways of communication; preservation and reproduction of the arts; genealogical ties; and close integration with the environment. Much of this knowledge is continued and sustained through churches, communal gatherings, reciprocal exchange of goods, ceremonial occasions and transference of stories and values to the younger generation. Due to the strong nature and structure of Pacific people and their cultures, Pasifika youth are more likely to have this indigenous knowledge embedded very early on in life and sustained through their communal and familial gatherings.

The aim of this study was to explore the social-cultural determinants of the obesogenic environment among young Pacific people aged 16–24 years living in New Zealand. The investigation included documenting lived experiences of obesity and body size, relationship of cultural values and beliefs regarding food, and the impact of these experiences as they relate to the participants. The 16–24 year age...
group was selected for several reasons. It: (i) comprises approximately 19% of the total Pacific population in New Zealand and 21% of this age group are obese; (ii) is regarded as a critical period for developing a basis for better health, and good health-promoting behaviours; and (iii) is an age group that has the capacity to take up early prevention and intervention strategies if the opportunity is available, because they have the independence to make lifestyle changes, that not only will improve their own future health status, but it will also have long-term implications for the wellbeing of future generations of Pacific peoples. The origins of this study, Chewing the facts on fat (CTFF), provides an overall understanding integrating knowledge drawn from social, cultural and historical data that can be translated later into actionable knowledge (eg, development of resources) specifically for Pacific people. The project received ethical approval from the Central Health and Disability Ethics Committee, New Zealand (13/CEN/22).

Methods
The current paper presents, in part, findings from the work conducted in the first phase of the study. We conducted in-depth interviews among a convenience sample of 30 Pacific participants (16–24 years). The number of interviews required for the study was based on purposive sampling, determined on the basis of theoretical saturation, which may be achieved from anywhere between 15–20 interviews. However, we elected to conduct up to 30 interviews for each phase, which is more than sufficient as an exploratory study. The youth were recruited and invited to participate through two primary health care providers in two different locations: Wellington and Auckland, New Zealand. Both providers played an important role in the recruitment and follow-up of the participants throughout the initial part of the study. The trained research assistants, of whom were both registered nurses and youth counsellors also resided and worked at the collaborating health providers, contacted Pacific youth who: (i) self-identified as being Pacific youth between the aged 16–24 years; (ii) had one living parent and grandparent or care-giver that was of Pacific ethnicity; and (iii) were enrolled at the participating Primary Health Organisations in Wellington or Auckland, New Zealand. From here onwards, we will refer to the young Pacific people as Pasifika youth.

Overall, there were three phases of the study. However, for the purpose of this paper, we will be presenting the findings from phase one of the project. Phase one included a 90-minute interview by a trained Pacific research assistant. All interviews were conducted face-to-face and in English. Each participant had access to a copy of the questionnaire during the interview, so they could refer to the questions during the interview. Where possible, questions were drawn from validated and/or previously used questionnaires. The questionnaire comprised information on demography, cultural perspectives, living arrangements, and a range of health behaviours such as sleep hygiene and quality, cigarette smoking habits, diet and nutrition (over a 7-day period).

Age and ethnicity were defined and self-identified, respectively, at the time of the interview. Deprivation was assessed using the New Zealand Deprivation Index 2013 measure, a small area based measure of deprivation derived from the 2013 Census, which uses nine variables (benefit income, employment, household income, communication, transport, support, qualifications, living space and home ownership) from the Census to place small area blocks on a deprivation scale from 1 to 10, with 10 representing the most deprived 10% of New Zealand areas, while 1 represents the 10% least deprived areas. For analyses, deprivation was categorised into quintiles combining deciles 1–2, 3–4, 5–6, 7–8 and 9–10.

Education achievement was dichotomised into whether participants left school with some measured national level of school qualifications (eg, NCEA) and those who obtained post-school qualifications (ie, Trade Course Certificates, Diplomas).

The research assistants measured and reported each participant’s weight and height, from which BMI was determined. For this study, we used the international standard cut-offs in defining obesity. BMI was analysed as a continuous variable, with a BMI of 25–29.9 kg/m² and ≥30 kg/m²
defined as being obese and overweight, respectively. Waist-to-hip circumference was also measured, from which the waist-hip ratio (WHR) was determined, to provide a measure of central adiposity, indicating associated risk of incident cardiovascular events. We also calculated the waist-to-height ratio (WHtR), as an adjunct measure of central obesity, which is less prone to measurement error than WHR.

As a novel aspect, we also collected receipts of purchased food from the participants over a 1-week period, to explore actual food purchasing behaviours, in order to obtain a snapshot of what and where Pasifika youth were spending their money. Although obtaining a snapshot of these behaviours is not a novel approach in the public health research context, the use of purchased receipts is new and different. This is the first time that a geographic information system (GIS) tool has been used to map the food receipts as a proxy measure of describing purchasing behaviours of Pasifika youth. In previous studies, geocodes of urban and residential neighbourhoods and fast-food and convenient store outlets using straight line buffers were used to examined their proximities to stores. For the current study, we wanted to examine how best to use GIS and receipts as an actual measure of food purchasing behaviours within the Pasifika youths’ local and residential obesogenic environment. We used the ArcGIS 10.1 tool to input the receipt information and produced depictions of purchases of food and snacks over a 7-day period, collected from the participants. The food purchases were grouped into four categories: $100; $25–99; $10–24; and <$10.

Due to the exploratory nature of this study, cultural perspectives on dietary lifestyle and influence on body size underwent thematic analyses, and the responses were grouped and coded according to the main themes drawn out from the analyses. We also grouped analogous themes of responses where open questions were asked to describe or explain beliefs and perspectives. We managed the trustworthiness of the qualitative data at phase three of the study, at a workshop, where we presented the preliminary findings of the overall project to the participants as a process of validating the content. The participants did not identify any issues or discrepancies or misleading inferences from our analysis.

Self-examination of perceived body size was investigated by utilising somatotype pictures, which was used in a previous study that was pretested among Pacific people. They are presented in Figure 1. The participants were asked to select the image that best reflects their perceived current body size and then to select a perceived ideal body size, with a space provided for participants to explain their selections, as appropriate.

The acculturation tool used in this study was developed by researchers of the Kohala Health Research Project, and it was included in this project because it is a validated tool among adult Native Hawaiians examining similar health outcomes (metabolic health problems). Following the Kohala Health Research Project, we analysed the responses by grouping the summed responses into the following categories: integrated (high affiliation with Pacific heritage and mainstream culture); tradition (high

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**Figure 1:** Somatotype body size types.
affiliation with Pacific heritage only); assimilated (high affiliation with mainstream culture only); and marginalised (low affiliation with both Pacific heritage and mainstream culture). A copy of the full questionnaire is available from the authors on request.

Results
Details of the participant’s characteristics are described in Table 1. A wide range of pan-Pacific ethnic groups were represented, indicating a diversity of Pacific ethnic groups in the younger generation of Pacific peoples in New Zealand. Samoans were the largest self-identified ethnic group in this study sample. The participants presented with minor co-morbidities, with only 20% presenting with treatment of asthma symptoms. In terms of socio-economic position, almost half of the study sample resided in the highest deprivation quintile.33

All participants lived in homes with approximately five rooms per house on average, and the number of people living in these homes ranged from one to 13 persons.

The youthfulness attribute of this study was reflected by their educational status as being predominantly school-level achievements being reported, and four of the 30 are currently attending university institutions to attain higher education status.

In describing the study participants, on average they are heavy in weight (90.5kg) and tall in height (170.4cm), thus reporting a higher BMI (range: 20.9–49.4kg/m²), and a relatively high WHR (mean: 0.8; range: 0.7–0.9) and WHtR (mean: 0.56; range 0.4–0.7). The WHO cut-off for WHR for men is ≥0.9 and ≥0.8 for women.38 In our study, for the WHtR scores ≤0.5 is deemed healthy.37

A large proportion (80%) of the participants assessed their acculturation mode as being ‘integrated’, indicating this study sample as having a high degree of affiliation with both their Pacific heritage and the mainstream culture.

Over 80% of the participants have strong connections with their communities, as characterised by their strong affiliation with a church group, heavily placed values in spiritual beliefs, and participation in community affairs. This is common of New Zealand Pacific and other youth (school-aged) in general.45,46 However, when asked if their cultural and spiritual beliefs influence the food they eat, the majority (66%) of the participants reported that their

Table 1: Distribution of participant characteristics.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>Female</td>
<td>19</td>
<td>63.3</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NZ European</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Māori</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Samoan</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>Cook Island Māori</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Tongan</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Niuean</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Chinese</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Indian</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtained school qualifications</td>
<td>22</td>
<td>73</td>
</tr>
<tr>
<td>Obtained qualifications since leaving school</td>
<td>13</td>
<td>43</td>
</tr>
<tr>
<td>Co-morbidities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthma</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Psychological problem</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Sleep problem</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Other conditions: Eczema</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>NZ Dep2013 (quintiles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1–2</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>3–4</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>5–6</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>7–8</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>9–10</td>
<td>14</td>
<td>46.7</td>
</tr>
<tr>
<td>Body Weight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>30</td>
<td>90.5kg</td>
</tr>
<tr>
<td>Height</td>
<td>29</td>
<td>170.4cm</td>
</tr>
<tr>
<td>Waist</td>
<td>26</td>
<td>95.4cm</td>
</tr>
<tr>
<td>Hip</td>
<td>26</td>
<td>113.1cm</td>
</tr>
<tr>
<td>BMI</td>
<td>29</td>
<td>31.0kg/m²</td>
</tr>
<tr>
<td>WHR</td>
<td>26</td>
<td>0.84</td>
</tr>
<tr>
<td>WHtR</td>
<td>25</td>
<td>0.6</td>
</tr>
<tr>
<td>Domestic Environment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rooms in house</td>
<td>30</td>
<td>5.6</td>
</tr>
<tr>
<td>People living in house</td>
<td>29</td>
<td>5.9</td>
</tr>
</tbody>
</table>
belief systems do not have an influence on the food they eat. Six participants did not answer this question. For the remainder of participants who reported that their spiritual beliefs do have an influence, we grouped similar responses into two main themes: (i) spiritual beliefs influence food, because it is part of the Pasifika culture (n=10), personal interactions generally involve a reciprocal exchange of food (or money); and (ii) it is part of the culture of the church (n=9), including traditional activities such as, weddings, Sunday school, White Sunday (n=9).

Self-examination of ‘perceived’ current and ideal body sizes depicted from Figure 1, indicated that the majority of participants regarded size four as being their perceived current body size, and size three as being their perceived ‘ideal’ body size. A large proportion (66.7%) of the participants agreed that their cultural beliefs do not influence body size perceptions. Only eight participants said that “being big is normal and healthy”, from a Pasifika perspective. Five of these eight people reported that being big in body size is not an important social issue, and nor is it regarded as a health priority. Alternatively, other viewpoints from 22 participants reported that having a ‘big body is not healthy’, with a similar number (n=21) agreeing that a big body size has the propensity for poor health. A small number of the participants (n=4) supported a cultural perspective as a “way of thinking” that inhibits people’s views of how health and body size are perceived. That is, cultural viewpoints can impede living a healthier lifestyle and being receptive to new knowledge, although this was not a strong indicator in this study.

<table>
<thead>
<tr>
<th>Questions</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you have cultural-spiritual beliefs?</td>
<td>Yes</td>
<td>25</td>
</tr>
<tr>
<td>No</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Do the cultural-spiritual beliefs influence body size perceptions?</td>
<td>Yes</td>
<td>9</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>66.7</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>Select the body size that you perceive looks most like you now?</td>
<td>Size 2</td>
<td>4</td>
</tr>
<tr>
<td>Size 3</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Size 4</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Size 5</td>
<td>6</td>
<td>20</td>
</tr>
<tr>
<td>Size 6</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Select your ideal body size?</td>
<td>Size 2</td>
<td>7</td>
</tr>
<tr>
<td>Size 3</td>
<td>11</td>
<td>36.7</td>
</tr>
<tr>
<td>Size 4</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Size 5</td>
<td>5</td>
<td>16.7</td>
</tr>
<tr>
<td>Acculturation scores</td>
<td>Integrated</td>
<td>24</td>
</tr>
<tr>
<td>Traditional</td>
<td>2</td>
<td>6.7</td>
</tr>
<tr>
<td>Assimilated</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Marginalised</td>
<td>1</td>
<td>3.3</td>
</tr>
</tbody>
</table>
Based on the acculturation tool used in this study, the majority of the participants were reportedly: integrated (80%), followed by assimilated (10%), traditional (6.7%), and marginalised (3.3%). This indicates that for Pasifika youth in this study, most of them have equally strong affiliations to their Pasifika, and the mainstream culture.

By observing the food purchasing behaviours of Pasifika youth by entering their spontaneous and weekly food purchases, the GIS tool illustrates exploratory patterns that differ between the Auckland and Wellington-based youth, as seen in Figures 2 (Auckland) and 3 (Wellington). In particular, the Auckland youth bought food only within their immediate neighbourhood, and the Wellington youth purchased food across a diverse range of food outlets and across a larger geographic distance, in some cases over 10kms from their home address (individual data not presented here).

**Discussion**

The findings presented here provide interesting social-cultural perspectives of obesity from Pasifika youth in New Zealand. Many of the findings are in agreement with what has been previously reported on known obesity risk factors associated with poor health outcomes for Pacific people, in general. However, some important new patterns of behaviour and knowledge were found that may be beneficial for researchers to consider when developing obesity intervention and preventative strategies, particularly for populations that have a strong affiliation with their culture, regardless of being obese or having a large body size.

Before discussing these, we acknowledge that the study has some limitations, particularly as it is primarily exploratory in nature and involved a small number of study participants. However, in this discussion segment, we would like to highlight the knowledge gained from this study.

Although, the quantitative findings are subjected only to the participants of this study, we wanted to observe how participants with high or low WHtR rated across the different modes of acculturation. The results showed that 55% of participants with an integrated acculturation mode had a high WHtR (>0.5), indicating that this group of Pasifika youth have an unequivocally strong affiliation with the mainstream and Pasifika cultures. The strong connection towards the mainstream culture was expected, particularly as 50% of Pasifika children and youth are born in New Zealand.

An interesting aspect of this finding is to determine whether the move away from traditional Pasifika cultures alone is due to acculturation, which may play an important role in weakening traditional values and lifestyle. This is important, because it is thought that indigenous Pasifika cultures could provide protection for optimal health and wellbeing for their own people. For example, according to the New Zealand Mental Health Survey (Te Rau Hinengaro), Pacific-born people who migrated to New Zealand at an older age (18+ years) have a lower prevalence of mental disorders, compared to New Zealand-born Pacific people.
their cultural context and spiritual beliefs having less or no influence on their body size and the types of food they eat support the interesting aspect highlighted above. There was also a good indication that the youth participants have a good knowledge base of the serious health consequences of being overweight or having a large body size.

For those who perceived that Pasifika culture and spiritual beliefs do have an influence on body size, our crude thematic analyses highlighted that our Pasifika participants have a greater acceptance of large body sizes based on a spiritual foundation (ie, that we were created in the image of God). Having a thinner body size was less tolerated and often denoted sickness. However, the participants reported that being big attracts social risks (eg, being teased and feeling embarrassed). These same participants also rated themselves as being marginalised, according to the acculturation tool.

Increased body weight is a known risk factor for long-term non-communicable diseases, such as cardiovascular disease\textsuperscript{26,28} and diabetes.\textsuperscript{1,29} However, the study participants presented with a higher than average BMI (WHR and WHtR) scores, and this is compounded by the presence of other known proximal factors (high deprivation and comorbidity), which illustrates time and again the poor health outcomes projected for Pasifika people, and particularly that of the younger generation.\textsuperscript{1,24,49,50}

Our study highlighted the impact of social and cultural factors within their immediate obesogenic environment. Firstly, participant perceptions in relation to perceived and ideal body sizes demonstrated that there is an unequivocal awareness and knowledge among this group of participants about the impending poor health outcomes, secondary to obesity. While the youth identified themselves as having bigger somatotype body sizes, they also viewed themselves as having a slightly smaller somatotype body size, as their ideal body size. Anecdotally, the participants' ideal perspectives on wanting a slightly smaller body size, was not an indication of body size dissatisfaction, irrespective of their current body size according to their actual BMI and WHR. In our view, the perceived 'ideal' body sizes suggest that the youth in this study preferred body sizes that were physiologically healthy (not very skinny or very big), and likely to be attained. This indication does not align with previous Polynesian ideals that very large bodies are highly valued,\textsuperscript{51} but is aligned with more recent work that demonstrated Pacific adolescents do not place idealistic views and values according to ethnicity, and have a more positive perception of their bodies.\textsuperscript{52-54} Only a small number of participants remained steadfast to cultural values, whereby having a large body size is indicative of social standing and wellbeing.\textsuperscript{28} Interestingly, it is often speculated that Pacific culture provides a central framework for protecting and developing optimal health and wellbeing for Pacific people. More often than not, researchers examine Pacific peoples' socioeconomic position and socio-cultural factors illuminating the full impact on health, but there is emerging research\textsuperscript{52,55,56} investigating health-enabling and social protective effects of culture and indigenous knowledge, and how this impacts on health with increasing acculturation. More than 80% of the participants interpreted their current cultural status as being 'integrated', demonstrating that the participants in this study have a positive attitude and place a good degree of importance on their Pacific and New Zealand mainstream cultures. A small proportion (10%) of the study participants aligned to 'assimilation', suggesting they have adopted a high degree of the attitudes and knowledge of the mainstream culture. Less than 7% were classified as 'traditional', when a person only engages in and places a high importance on their Pacific heritage. Marginalisation occurs when there is very limited or no involvement with both Pacific and mainstream heritage, and for the current study, this was not the case. Our exploratory findings were similar to that of the Kohala Research project.\textsuperscript{44,57} That is, the integration mode of acculturation was a prominent feature, but differed according to assimilated and traditional modes. Although the design, purpose and study samples were markedly different to that of the Kohala research project, important inferences can be made about the current study, particularly in relation
to the youthfulness of our participants and their interaction within an environment that is less restricted to Pacific cultural boundaries. Additionally, we recognise that in future obesity-related and Pasifika youth work, other relevant dimensions of acculturation (e.g., retention of strong cultural attitudes and behaviours that lead to positive benefits) would provide important information and assist in identifying potential avenues of culturally acceptable preventative efforts.58-60

Our geospatial findings, showed that the pattern of purchases of food and consumption provide some initial information that could be important when planning and evaluating the built and food obesogenic environment, particularly given the observed food spending behaviours of Pasifika youth. When we presented the GIS findings to the youth and asked them to comment on their behaviours collectively, the common thread of how their local environment marketed ‘known’ and ‘cheaper’ food that are frequently purchased by Pasifika people (e.g., “lollie saiga”) played a major role in where the youth would spend their money. This is not new knowledge as indicated by previous research conducted on snacking behaviours,61 and collected knowledge on how “local shop-keepers know how to cater for Pasifika peoples’ tastes and needs.”62 However, GIS could be an important research resource that can examine the role of the physical environment and its constituencies (e.g., local stores, community organisations), and how they can work together to change the nature of the community and environment, for the sake of healthier living.

**Conclusion**

The participants from this study were youthful, obese, living in the most deprived areas and culturally adapted to the mainstream, without being isolated from their Pacific heritage. However, this is not a positive trajectory for the future generation of the young Pacific generation in New Zealand. From this exploratory study, we highlight the following: (i) the future health and wellbeing of our Pasifika youth remains to be poor. There continues to be a lack of understanding on the social-cultural mind set of Pasifika youth in New Zealand, and having this knowledge may lend itself to developing culturally and temporally relevant intervention programmes, the analyses of diet and eating behaviour in the second part of this study will contribute to this; (ii) in addition, an in-depth examination of the role of culture as a social protective framework requires further robust investigation to identify if indigenous knowledge and practices change with societal pressures and acculturation. Identifying the enablers and barriers against the obesogenic backdrop, can provide very useful information. This is necessary, particularly if we continue to use the concept of ‘culture’, as an important health resource that will protect the health and wellbeing of a population that is already high risk; (iii) use of spatial analysis using purchased food receipts, can provide new information to add to the current knowledge base of obesity-related research.

Overall, what is needed now, is information of developing methods or programmes in which this information can be translated into actionable knowledge. This needs to be a priority, particularly for Pasifika people in New Zealand.
Competing interests:
Nil

Acknowledgements:
The authors would like to acknowledge the partnership funding from the Health Research Council of New Zealand and the Ministry of Health who supported this study. We also thank our collaborating partners: The Fono and Evolve for participating in this project, especially Mr Tevita Fuanaki for supporting the work of this project. Finally, the authors are indebted to the efforts and participation of the Pasifika youth and their families.

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What do African new settlers in New Zealand ‘know’ about HIV?
Mark Henrickson, Meaghan Fisher, Adrian Ludlam, Fungai Mhlanga

ABSTRACT
AIM: To demonstrate the differences between objective and operational knowledges of HIV transmission and care in Black African migrants, and how these differences may be managed in a clinical interview.

METHOD: This two phase national New Zealand study first estimated the resident Black African migrant population and HIV seroprevalence. The second phase collected surveys (n=703); focus groups (n=131 people) amplified the survey data. Community advisory groups comprising community leaders and people living with HIV were consulted throughout the study.

RESULTS: Black African migrants reported good levels of basic knowledge of HIV on the survey, but demonstrated a range of culturally constructed beliefs and operational knowledge in focus groups.

CONCLUSION: Study findings suggest that objective knowledge assessment is not sufficient, and that a contextual approach to understanding what people ‘know’ is essential, not only for HIV, but for the delivery of all health care education and interventions to Black African new settlers. Routine HIV education and testing, together with staff education, may increase acceptance of these interventions.

In 2010, a New Zealand Ministry of Health request for proposals defined African communities in New Zealand as a population at high risk for HIV disease, and called for further investigation into these communities. Prior to the present study, however, very little was known about African communities in New Zealand—and about Black Africans in particular—including an estimate of the number resident in New Zealand, the prevalence of HIV in Black African communities, or the knowledge, attitudes, behaviours and beliefs (KABB) about HIV in these communities which contribute to the transmission and management of HIV, and the stigma associated with the disease. In response to these issues, the present research was proposed and funded. The mixed method research project was conducted in two phases: the first phase used existing data sources in order to estimate the number of Black African new settlers in New Zealand and the prevalence of HIV in these communities. The second phase was a quantitative survey amplified with qualitative data from focus groups to assess the KABB of Black African new settlers about HIV.

A full report of the entire project, including a complete discussion of methods and findings, is beyond the scope of the present paper, and is available elsewhere. The purpose of this paper is not to report on the primary data, but rather to provide some key findings, analyses and conclusions from this unique dataset that are specifically relevant to New Zealand medical providers as they work with Black African new settlers. Specifically, we propose that while Black African new settlers demonstrate a high level of basic, objective knowledge of HIV transmission, there is an apparent disconnect between this objective knowledge and the informal, but perhaps more significant, discussions of this same topic which emerged in focus groups. This second kind of operational knowing is contextual, and is shaped more by religious and cultural expectations of acceptable behaviour, than by objective or factual knowledge about transmission. This space between what people ‘know’ and what they believe is important for the development of effective, targeted public health interventions, and for addressing individual barriers to HIV education, testing and care.
We recognise that discussions of race and ethnicity are fraught in both African and New Zealand contexts, and that definitions of who is African is a highly contested issue, even in African nations. Our decision to focus on Black Africans (as opposed to all African-born migrants) was based in part on a South African household study of HIV prevalence which showed that the highest prevalence of HIV was in Blacks relative to Whites and Coloured, and on the Mayisha II study in the UK, a model for the present study that simply assumed without explanation that ‘African’ meant ‘Black African’.

Methods
From the outset of the project, the research team worked closely with community advisers recruited nationally from Black African communities. The two advisory groups, made up respectively of community and religious leaders in Black African communities, and Black Africans living with HIV, were consulted regularly over the 18-month period of the project, and were given opportunities to review and comment on research instruments and the draft research reports before publication. Ethics approval for the study was given by an accredited academic human ethics committee.

Phase I: Demographic estimates
Since Black African ethnicity was not captured by any existing New Zealand source, the first phase of the study used existing data sources, including census data on ethnicity, place of birth, language, and religion, as well as arrival and departure information, to develop an estimate of the New Zealand resident population of Black Africans at the end of 2011. In addition, laboratory and AIDS Epidemiology Group data were used, and HIV specialist provider information were canvassed for relevant HIV reports (even though these data are not reported by ethnicity) to develop an estimate of Black Africans living with HIV. This analysis led us to estimate that 12,500 Black African new settlers were living in New Zealand (or less than 0.3% of the total population), of whom an estimated 5% may be living with HIV. These first phase estimates served as a rough sampling frame for the second phase of the study.

Phase 2: Methods and sampling
The second phase comprised two arms, both of which were inevitably samples of convenience, since probability sampling for these relatively small communities was neither practical nor necessary when purposively recruiting an homogenous group. The first arm was an anonymous quantitative self-completed survey (n=703, or approximately 5% of the estimated resident Black African population) distributed by Black African research staff at African community and sporting events, festivals, pageants, churches, and other events in the four centres with the largest concentrations of Black Africans as found in the first phase analysis: Auckland, Hamilton, Wellington and Christchurch. Participants were provided a copy of the survey and invited to complete it anonymously on the spot, or to return it at a later time via a Freepost envelope. Survey team members anecdotally estimate that less than 5% of people approached at these events declined to participate in the survey. Survey questions were adapted from the Mayisha II and Bass Line studies from the UK, and developed in collaboration with the two Black African community advisory groups. Responses to the knowledge section of the quantitative survey were framed to be consistent with the UK studies for comparison, and were worded as statements with response options “I knew this”, “I didn’t know this”, “I wasn’t sure if this were true”, and “I don’t understand this”.

The second arm was a series of focus groups (n=131 in 23 focus groups around the country) that were recorded, transcribed and analysed. Participants were recruited by Black African research staff from the same community events where surveys were distributed, and from Black African community groups, interest groups and churches. Some, but not all, focus group participants may also have completed a survey (because of anonymity there is no way to know this definitively). All groups but one were held in English, although in some groups summaries or simultaneous interpretations in relevant languages were provided if required. Once the focus group convened, participants were consented, asked to sign a confidentiality agreement and to choose a pseudonym for
the purposes of the group. Great care was taken to ensure that participants were fully informed, voluntary, and their identities protected; these methods are fully elaborated elsewhere.\textsuperscript{10,11} Topic areas and specific questions were developed in collaboration with the project advisory groups, and included settlement experiences in New Zealand, attitudes about the appropriate age for sexual activity, same-sex sexual activity and relationships, multiple sexual partners, condom use, HIV testing, disclosure of HIV, HIV education and awareness, and African cultural understandings about HIV. At the end of the 90-minute group, participants were invited to complete anonymously a short demographic questionnaire, put it in an envelope and deposit it in a box as they left; only two participants submitted blank forms. Project staff from Black African communities facilitated groups of participants of their own genders so that men and women did not need to discuss intimate matters in front of opposite gender participants.

**Results**

Findings have been selected here in order to focus on survey and focus group similarities and differences on key KABB questions.

**Survey**

The survey included responses from 343 (48.8%) men and 351 (49.9%) women; 9 (0.1%) responded as other or did not state gender. Ages included 214 (30.4%) in the 16–24 year old group, 273 (38.8%) in age group 25–39, and 160 (22.7%) in the 40 and older group; 56 did not respond to the age question. Most respondents (65.8%) had a tertiary education, as we would expect from a new migrant group. Christianity was the religion of 571 (81.2%), and Islam of 94 (13.4%) respondents; the others were African traditional religions, Buddhist, other, none, or not stated, each comprising 2% or less.

Respondents reported high levels of knowledge of HIV transmission (“I knew this”). For example, 90% of all respondents (n=605 of 674 responding) knew that “HIV is never passed on through shaking hands or touching people”, 88% (n=596 of 674) knew that “Condoms reduce the risk of HIV transmission during sexual intercourse”, and 73% (n=491 of 673) knew that “HIV is never passed by mosquitos or other insects”. Analysis by age groups found differences between younger (≤24 years) and older (≥25 years) demographic groups. Among older respondents, 92% (n=382 of 413) indicated that they knew that HIV is not contracted through touching, whereas only 85% (n=174 of 204) of younger respondents indicated the same. In older respondents, 79% (n=325 of 413) said that they knew that HIV is never passed by mosquitoes, but only 61% (n=123 of 203) of younger respondents reported the same knowledge. Both age groups indicated that they knew that condoms reduce the risk of HIV transmission (88% of younger respondents, n=178 of 203, and 89%, n=369 of 415, of older respondents knew this.) Traditional beliefs about HIV also play a role in attitudes to testing in a small number of people: 5% of survey respondents believed that witchcraft was a cause of AIDS (although 31% said they did not know if this was true), and 8% believed that a person would not join their ancestors if they died a dishonourable death from AIDS (27% did not know if this were true).

**Focus groups**

The focus groups comprised 76 males (58%) and 54 females (41%), and one did not specify gender; 31 (24%) identified as Muslim, 88 (66%) identified as Christian, and the rest reported no religion, other, or did not respond. Of focus group participants, 103 (78%) identified as heterosexual, two (1.5%) identified as homosexual, and 26 (20%) did not specify a provided option. Three participants (2%) identified as HIV positive, 101 (77%) identified as HIV negative, 16 (12%) said they did not know their HIV status, and 11 did not respond to the question about their HIV status. The mean time living in New Zealand was 7.5 years (SD=5.09).

**Knowledge**

There were different kinds of operational knowledge identified in the qualitative data. Some participants expressed the belief that religion and marriage each provided a kind of prophylactic effect against HIV transmission:

“If you are a religious person, you’re not gonna get HIV because you going to the right way, how you gonna get
the HIV unless by accident, like we say, injury?”
(male, Group 1, Auckland)

The presumption of fidelity within marriage, whether monogamous or plural marriage, was seen as a defense against HIV transmission:

“We only get married when we have sex, so it’s not like you can have sex with different people that you don’t know, like strangers, and you know your husband, he’s healthy.”
(female, Group 2, Auckland)

However, a substantial number of participants indicated that men and women were held to different standards with regards to sexual infidelity:

“Women are kind of more respected for having less partners, and men are more respected for having more partners.”
(female, Group 3, Auckland)

While women are expected not to engage in sex outside of marriage, men are not held to such strict standards:

“In Africa, ‘monogamous’ relationships are much worse because…you’ll find that…men sleep with women and then they have children with them and then they leave them...And then they go to another.”
(female, Group 4, Auckland)

One participant noted:

“[In New Zealand] if [men] have more than one or two partners it’s usually like an affair and it’s all hidden. In Africa if they do that they, like you have four wives, it’s out in the open, you marry four women, which is kinda gross, but you did, and everyone knows it.”
(female, Group 4, Auckland)

Participants catastrophised relatively small risks: participants felt there was little they could do to avoid infection. Examples include rationalising not using condoms, and accidental contact infection:

“The condom can explode and then they get the disease.”
(female, Group 5, Auckland)

“You have an accident, someone has blood and then you touch it, then that’s it, you get [HIV].”
(male, Group 1, Hamilton)

Many participants expressed a reluctance to use condoms within committed relationships, saying that using this kind of protection implied a lack of trust of the partner. Cultural and religious norms also factored into condom use:

“The focal point of marriage is having children...They can’t see the point of why are you getting married if you don’t want kids.”
(female, Group 8, Wellington)

When asked about condoms, most participants understood them as a form of contraception, but their use for STI—and in particular HIV—risk reduction was a secondary or conflicted consideration for most:

“I know for a fact that Catholics are completely against contraception unless it’s a case of...medical condition, unless it’s going to kill you and then you need to have contraception. But I know that they don’t like people using contraceptions which kind of makes it...contradict with the fact that we don’t want the spread of HIV and the solution to it is contraception.”
(female, Group 4, Auckland)

There was also a sense that exposure to HIV necessarily meant that a person was immediately infected with HIV, and any subsequent protection was unnecessary:

“When a couple, one of the couple have HIV, by the time it will be known that means that they both have it.”
(female, Group 7, Auckland)

Stigma

Some participants suggested a need for protecting themselves against people with HIV, even when there was low or no risk:

“Just don’t share anything [with] them like drink-wise, it’s just for safety.”
(female, Group 6, Auckland)

Some participants expressed concerns that individuals living with HIV were consciously and deliberately attempting to infect others:

“I hear when they found they got HIV they took their blood and...if the women are cutting the onion and...
the salad and making the salad, she might add her blood to that food."
(female, Group 2, Auckland)

This fear of people living with HIV manifested itself in other ways, including social and physical isolation of seropositive individuals:

“If I in case see that person I will take to the hospital, somewhere they can keep [them isolated], so nobody will see that person.”
(female, Group 2, Auckland)

Provider response

A complex relationship between Black Africans and HIV testing emerged. While some were enthusiastic about testing, particularly at the beginning of a new relationship, others expressed concern about the stigma attached to the act of testing or seeking information about HIV:

“There’s HIV centres you can go to, but if you go there, even if you’re going with someone, people will think you have it.”
(female, Group 8, Wellington)

“Because of the stigma...no one can easily go there. And again, people are scared of just being diagnosed because we come from a mindset it’s a death sentence.”
(female, Group 8, Wellington)

Many focus group participants expressed high levels of discomfort about associating with men who have sex with men (MSM), and in accessing HIV information and resources through perceived gay organisations. Approaching gay organisations for information amplifies the already considerable levels of stigma around HIV in African communities. However, one participant noted:

“It’s time we started looking at it in a different way ‘cos we are coming under the gay community, which is not common in our community.”
(female, Group 8, Wellington)

Discussion

What is knowledge?
The quantitative data in this study confirms findings in other studies that there is a high level of basic knowledge about HIV transmission in Black African new settlers, particularly in older respondents who may have learned this information in their home countries. The disparities by age in knowledge about transmission are of some concern, given that Black African communities include larger proportions of young people relative to other ethnic groups, and clearly more targeted education is required. Many of these young people will have been born in New Zealand, or arrived at a very young age, and will have been exposed to HIV education only in New Zealand, if at all.

These findings are consistent with those of the Bass Line study, which demonstrated that basic knowledge of HIV was lowest in the youngest members of Black African communities in the UK. From a medical and epidemiological standpoint, however, these survey findings are generally encouraging.

However, what this study suggests is that the survey findings alone present only a partial and insufficient portrait of the operational knowledge that is used in daily life by members of these communities to affiliate with cultural and religious norms, a problem that the focus group data help to elucidate. Black African new settlers’ experience and knowledge of HIV is shaped not only by objective information and transmission facts, but also by multifarious social and cultural forces. A belief in supernatural causes of HIV, for instance, and the accompanying fatalism may be one reason why some participants do not see the value of HIV testing. Cultural and religious expectations impact participants’ perceptions of their actual risks for HIV infection, and the willingness to adopt what have become standard prevention technologies, (“But I know that they don’t like people using contraceptions which...contradict with the fact that we don’t want the spread of HIV.” Group 4).

Public conformity to these community expectations promotes a sense of immunity if the individual adheres to accepted norms and standards of acceptable behaviour (“If you are a religious person, you’re not gonna get HIV because you going to the right way” Group 1). The dissonance between beliefs that are publicly stated, and what is done in private, has been considered elsewhere. However, publicly stated, and perhaps
privately held, beliefs may limit open and honest communication with medical providers about perceived risk behaviour, and the acceptance of accurate information relating to HIV.\textsuperscript{14,15}

The pervasive impact of stigma
Black African migrants also face intersectional stigma, stigma from non-African New Zealanders because they are Black, stigma because they are new settlers, and stigma that associates African identity with HIV.\textsuperscript{15} This stigma has an impact on the willingness of Black Africans to seek out HIV education, testing, and treatment. The very act of volunteering for testing for HIV, or even seeking out prevention information, suggests that the individual has risk behaviours (such as having sex before marriage, or multiple sexual partners, or a man who is having sex with another man), which are stigmatised in public Black African discourse. In Black African contexts, even the relatively neutral term “man who has sex with a man” may evoke stigma and create barriers.\textsuperscript{16} If a medical provider recommends HIV testing, the implicit message is that the provider thinks the individual is engaging in behaviours that put them at risk, behaviours that would violate powerful cultural norms (“There’s HIV centres you can go to, but if you go there even if you’re going with someone, people will think you have it.” Group 8). This may lead to denial of such behaviours. Resistance to associating with men who have sex with men (MSM) may lead Black Africans to avoid accessing HIV resources through gay-identified organisations (“we are coming under the gay community which is not common in our community” Group 8), which remain key sources for education about HIV.

Other factors, such as attitudes about HIV, perceived risk behaviours, racism, and the need to be perceived as ‘model’ new settlers by denying the existence of risk behaviours, also make decisions to seek testing and treatment more fraught.

Provider responses
How, then, can medical providers engage with Black African new settlers around HIV? Community recommendations to researchers include normalising routine HIV education, counselling and testing at health care providers, and contextualising HIV along with other chronic, life-threatening health issues in Black African communities such as cancer and diabetes. These recommendations also note that routine HIV testing should be linked to increased education in health and dental care providers, including support staff, in order to decrease the stigma that surrounds HIV and Black African new settlers in New Zealand.

Limitations
There are many possible limitations to this study, including the absence of a clearly defined sampling frame; purposive homogenous sampling included only people who are socially engaged with African community events, and excluded people who spoke no or very limited English. There is also an underrepresentation of Muslims in our survey participants. We know from many sources, including our HIV positive community advisors, that Black Africans who are HIV positive or who are MSM are very reluctant to disclose in any public way, and are quite likely to say “don’t know” in response to these questions. We are also mindful of the possibility of social desirability bias, the need for respondents and participants to be ‘model migrants’ in both survey and focus groups, and thereby provide responses they believe researchers want to hear. We have attempted to address some of these limitations through the two-arm approach and the extensive use of our two advisory groups, but clearly much more research is required to understand the multifarious forces that shape the HIV knowledges of Black African new settlers in New Zealand.

Conclusion
Healthcare professionals rarely have time to interrogate notions of knowledge and truth, and usually take what patients say at face value. They will not be entirely incorrect. Familiar questions and algorithms, however, may not capture all the required information, since different cultures have different ways of communicating, and attribute different meanings and values to experiences and knowledge. What Black Africans disclose, particularly to non-Africans, may not reveal all of what they think, understand, or believe, because much of that knowledge and belief is implicit. Our findings suggest
that face value knowledge assessments are not sufficient, and that a contextual approach to understanding what people ‘know’ is essential, not only for HIV, but for the delivery of all health care education and interventions to Black African new settlers. In order to discover what Black Africans know about HIV, healthcare professionals will want to ask questions designed to elicit meaning and understanding, shaped by Black African religious and cultural expectations of acceptable behaviour. Understanding this space between what people ‘know’ and what they believe will assist in the development of effective interventions and address individual barriers to HIV education, testing and care.

 Competing interests:
 Nil

 Acknowledgement:
 This study was funded by the Health Research Council of New Zealand and the Ministry of Health, grant number 11/965.

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Prevalence of hepatitis C among injecting drug users attending drug clinics

Patrick O’Connor, Graeme Judson, Richard A Loan, Geoff Robinson

ABSTRACT

BACKGROUND: Chronic hepatitis C (HCV) infection is an important public health issue in New Zealand, and an increasing cause of advanced liver disease.

METHOD: This study examined the 2015 data on hepatitis C serology in patients on opiate substitution at four Alcohol and Drug Services, as well as rates of referral and responses to treatment for HCV.

RESULTS: Among 579 patients tested, 439 (76%) were positive for HCV antibody. For a subgroup of patients, those who reported their first use of injecting since 2010, the prevalence of HCV antibody was 48%. Among 405 patients with PCR/viral load test on file, 206 had a positive result when most recently tested. In all, 191 patients were referred for treatment, and of the 91 treated, 68 achieved viral clearance. Overall, it was found that 131 (32%) patients with a PCR/viral load test on file had cleared the HCV without treatment, as indicated by at least one negative PCR.

CONCLUSIONS: HCV remains highly prevalent in injecting drug users attending these clinics, with no important reduction in infection rates from past studies. There appears to be considerable rates of spontaneous viral clearance. Nevertheless, it remains important, from individual and public health perspectives, to refer patients for treatment, which is becoming increasingly effective and safe.

Chronic hepatitis C (HCV) infection is a major public health concern. The global prevalence of anti-HCV has been estimated at 1.7%, or 115 million cases, with 80 million of these being viraemic (RNA positive). HCV prevalence in injecting drug users (IDU) is known to be particularly high. Programmes for screening and the promotion of increasingly effective and safer treatments are encouraged by the Ministry of Health and the Hepatitis Foundation in New Zealand. There are estimates of up to 50,000 of the New Zealand population having been infected, primarily through past intravenous (IV) drug use, either sporadic or addictive.

Although Human Immunodeficiency Virus (HIV) has been well contained in New Zealand IDU, presumably through education and needle/syringe provision, there has been much less impact on the transmission of HCV in injecting drug users.

This audit was prompted by an interest in the current situation regarding screening and treatment for injecting drug users who choose to access drug clinics where they are primarily treated with opioid substitution treatment (OST), which of itself may be an important factor in reducing HCV transmission.

Methods

A simple data collection form was distributed to Medical Officers in lower North Island drug clinics. This recorded individual patient demographics, year of first injecting drugs, hepatitis C testing, and referral and results of HCV treatment by gastroenterology or infectious diseases services.

For logistical reasons, various clinics adopted different approaches to the data gathering. There was completion of the data for nearly all current patients being prescribed OST as of January to March 2015 for Wanganui and Palmerston North. Hawkes Bay and Taranaki completed the form for patients attending a medical appointment during this time period, which accounted for 75% of their clinic-supervised
OST patients. Patients prescribed OST by their GP and authorised by the clinic were excluded from this study.

**Results**

The serology and viral load results of the study are shown in Table 1.

For the 579 patients tested from all drug clinics, it was found that 439 (76%) were positive for HCV antibody and 140 (24%) were negative.

The results of the most recent HCV Polymerase Chain Reaction (PCR) available to the clinic showed that 206 were positive and 199 were negative. There were no results available for 34 antibody-positive patients.

It was found that 68 patients had achieved a negative HCV PCR following antiviral treatment. A further 23 had treatment but without successful outcome.

Thus, of the 119 negative PCRs, 68 were the result of treatment, and 131 other patients had at least one negative PCR, suggesting possible spontaneous viral clearance. This means that of the 405 patients who were antibody positive and had a subsequent viral load test, 131 (32%) have cleared the infection without treatment.

**Referral to specialist services for treatment of hepatitis C**

Across the four clinics it was found that 91 patients had treatment, and 68 were successful in terms of subsequent negative viral load.

We also collected information about the date of onset of intravenous (IV) use from three of the clinics (Taranaki, Hawkes Bay and Wanganui). The patients were divided into cohorts based on the 5-year period in which IV use started, and when they may have been first exposed to the hepatitis C

### Table 1: Results of hepatitis C testing at drug clinics.

<table>
<thead>
<tr>
<th></th>
<th>Wanganui</th>
<th>Palmerston North</th>
<th>Hawkes Bay</th>
<th>Taranaki</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Patients</td>
<td>89</td>
<td>269</td>
<td>88</td>
<td>139</td>
<td>585</td>
</tr>
<tr>
<td>Male/Female</td>
<td>57/32</td>
<td>157/112</td>
<td>52/36</td>
<td>69/70</td>
<td>335/249</td>
</tr>
<tr>
<td>HCV Antibody *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>77</td>
<td>206</td>
<td>53</td>
<td>102</td>
<td>439</td>
</tr>
<tr>
<td>Negative</td>
<td>10</td>
<td>63</td>
<td>31</td>
<td>36</td>
<td>140</td>
</tr>
<tr>
<td>Most Recent Viral Load Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>24</td>
<td>88</td>
<td>37</td>
<td>57</td>
<td>206</td>
</tr>
<tr>
<td>Negative</td>
<td>49</td>
<td>95</td>
<td>17</td>
<td>38</td>
<td>199</td>
</tr>
<tr>
<td>Successfully treated by antiviral</td>
<td>15</td>
<td>33</td>
<td>6</td>
<td>14</td>
<td>68</td>
</tr>
</tbody>
</table>

*HCV antibody results not available for six patients

### Table 2: Data on referral treatment.

<table>
<thead>
<tr>
<th></th>
<th>Wanganui</th>
<th>Palmerston North</th>
<th>Hawkes Bay</th>
<th>Taranaki</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number referred</td>
<td>36</td>
<td>83</td>
<td>31</td>
<td>41</td>
<td>191</td>
</tr>
<tr>
<td>Patient declined or did not attend</td>
<td>6</td>
<td>18</td>
<td>9</td>
<td>8</td>
<td>41</td>
</tr>
<tr>
<td>Reviewed by specialist but not treated</td>
<td>7</td>
<td>22</td>
<td>15</td>
<td>15</td>
<td>59</td>
</tr>
<tr>
<td>Number treated</td>
<td>23</td>
<td>43</td>
<td>7</td>
<td>18</td>
<td>91</td>
</tr>
<tr>
<td>Viral clearance</td>
<td>15</td>
<td>33</td>
<td>6</td>
<td>14</td>
<td>68</td>
</tr>
<tr>
<td>PCR positive after treatment *</td>
<td>8</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>22</td>
</tr>
</tbody>
</table>

*1 missing because lost to follow-up.
virus. Hepatitis C antibody prevalence was calculated for each cohort.

This demonstrates a steady decline in prevalence. Among those who first used IV before 1985, the hepatitis C antibody prevalence level is at least 90%. Among those who report first injecting use since 2010, the prevalence is 48%.

Discussion

The findings of this study regarding hepatitis C serology are similar to those found in a previous New Zealand study of injecting drug users attending the Wellington Drug Clinic in 1995. The Wellington study found that 77% of patients were antibody positive, and that 53% of those who had started IV use within the previous 4 years were antibody positive. This present study has found a 76% overall prevalence of HCV antibody among OST patients, and that 48% of those whose first use was during the previous 5 years (since 2010) were antibody positive. While the locations are different, the overall picture does not appear to have changed greatly over the past 20 years.

There are other estimates of HCV antibody prevalence among New Zealand IV drug users based on serology surveys of patients of needle exchange programmes. There have been three reported sets of results: 1997 (53%), 2004 (70%), and 2009 (52%). Some of the observed differences, especially 1997–2004, may be influenced by differences in median age and years of IV use among participants. The 2004 and 2009 results indicate that the seropositive rate among those who have used for less than 3 years was about 15%.

Our cohort analysis indicates that recent initiates to IV use have seroprevalence about 30% less than those who started 20 years earlier. Comparison with the 1995 study suggests that prevalence among new users then was similar to that found today. This suggests that the impact of measures such as needle exchange on new users is similar now to the impact in the early 1990s.

This study found that 32% of those known to be antibody positive, and with at least one viral load result, are now viral RNA negative, with no history of treatment, indicating spontaneous clearance. A prospective Swedish study of IV users who seroconverted over a 3-month period, found that 30% were viral RNA negative a year later. Grebely et al, in an international collaboration following 632 cases of acute hepatitis C, found 25% clearance 12 months after infection. A Chinese study which followed-up 96 patients infected via a blood donor, found that after about 10 years, 40% were viral RNA negative. Overall, our findings are consistent with published research, though some authorities quote lower clearance rates. For instance, information on the Centers for Disease Control and Prevention website says that “for 70%–85% of people who become infected with hepatitis C, it becomes a

![Figure 1: Percent HCV antibody positive by year of first IV use.](image-url)
long-term, chronic infection”, which indicates a spontaneous clearance rate of 15–30%.15

On the basis of those already treated, and those who are viral RNA positive and untreated, an estimated 274 patients have been eligible for treatment. Of these, 191 have been referred and 91 have actually been treated. There are a number of reasons why referral may not happen, and why treatment may not be offered. These include: perceptions of ongoing IV use and risk of re-infection; compliance problems; patient perception that side effects outweigh benefits; poorer outcomes for some genotype and IL28B profiles; and awareness that safer and more effective treatments will be available in future. Nevertheless, the overall treatment rate of 33%, mostly in the past 10 years, appears to compare well with the estimate of Gane et al that 1.8% of diagnosed patients are currently treated per annum.4

A significant number of patients (184) are viral load positive and have not been treated. There may be others, as there were 37 antibody positive patients who have not yet been tested for viral load. There has been a call to increase access to treatment of HCV in community clinics, which will benefit individual patients and will influence the HCV prevalence.4,16

The sample size of 585 patients represents about 12% of all opiate substitution patients in New Zealand. If our figures are extended to the country as a whole, then we estimate about 2,000 OST patients across the country are viral load positive and have not been treated.

It is of interest to speculate whether these findings shed light on the possible burden of hepatitis C in the wider community. Communication with local HCV treatment services indicates that 30–40% of all patients treated for hepatitis C over the past 5 years have been OST patients. This may indicate the proportion of diagnosed hepatitis C cases who are on OST, which in turn would yield an estimate of the total number of diagnosed hepatitis C cases. Gane et al suggest that hepatocellular carcinoma statistics, comparing previously diagnosed and undiagnosed hepatitis C, may indicate the relative proportion of diagnosed and undiagnosed hepatitis C in the community.4 Linking these various sources of information may help to estimate the total number of hepatitis C infections in the community and the future burden on treatment services.

This study shows the continuing high prevalence of hepatitis C among OST patients, and estimates a spontaneous viral clearance rate of 32%. Many eligible patients have been referred for treatment, and 36% of these have achieved the goal of successful treatment. Many of those referred (52%) did not progress to treatment. Future treatments which are more acceptable and effective will improve compliance and outcome for individuals still infected with hepatitis C.

Competing interests: 
Nil

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Specialist services for management of individuals identifying as transgender in New Zealand

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ABSTRACT

AIMS: In light of the rising number of referrals to secondary level services of people who identify as transgender, and the Human Rights Commission concerns regarding the care of this group in New Zealand, we felt it was timely to determine the availability of services for people who identify as transgender and whether there are variations in management protocols.

METHODS: We contacted 100 physicians involved in providing a secondary level service to care for people who identify as transgender, and asked them to complete a questionnaire about the services available in their region. This questionnaire consisted of two parts, a ‘general questionnaire’, which focussed on the consultants’ understanding of services available locally, and a ‘clinical questionnaire’, which presented hypothetical clinical case histories and asked respondents to indicate how they would manage the case.

RESULTS: Sixty-two of the physicians responded. Of these, 18 (45% of the 40 physicians that answered the question) believed they could access a psychological or psychiatric opinion in the public sector for a patient who identifies as transgender, whereas 28 (82% of the 34 that answered the question) knew of access in the private sector. There was a conflict of opinion on the availability of psychological and surgical services in several DHBs where there was more than one clinician responding. This may reflect the case experience of individual clinicians. There was restricted access to common surgical procedures in the public sector, and about half of respondents did not know if techniques were available locally.

CONCLUSIONS: Our results support the development of specialist care services in tertiary centres in addition to the secondary services already available in New Zealand for people who identify as transgender. Development of multidisciplinary management and improved access to psychological support services for individual cases is required.

Gender identity is a process entirely separate from the development of external genitalia, and is unrelated to sexuality.1-3 Gender nonconformity refers to the extent to which a person's gender identity, role, or expression differs from the cultural norms prescribed for people of a particular sex.4 Gender dysphoria refers to discomfort or distress that is caused by a discrepancy between a person's gender identity and that person's sex assigned at birth (and the associated gender role and/or primary and secondary sex characteristics), of which only some gender non-conforming people experience at some time in their lives.5 We have used the term ‘transgender’ throughout this report. The term is inclusive of, but not limited to, people who identify as trans, transsexual, takatāpui, whakawahine, tangata ira tane, fa'aafafine, akava‘ine, fakaleiti, mahu, vaka sa lewa lewa, fiafifine, and genderqueer.

Studies have concluded that gender non-conformity is not associated with psychopathological disorder.6,7 However, individuals identifying as transgender are more likely to experience mental health problems such as anxiety, depression, and functional impairment, and are at higher risk of suicide.8-11 This is perhaps not surprising given the specific issues that people who identify as transgender face, which may include body dysphoria, discrimination and victimisation.12,13
Recent surveys have suggested a much higher rate of people identifying as transgender than previous reports from specialist transgender clinics. Initial estimates were of the order of 1:11,900 to 1:45,000 for individuals who identify as male-to-female (MtF) and 1:30,400 to 1:200,000 for individuals who identify as female-to-male (FtM). Subsequently, based on information taken from New Zealand passport holders in 2008, the prevalence of people identifying as MtF was estimated at 1:3,600, and the corresponding figure for people identifying as FtM was 1:22,700.

More recently, in the Boston Youth Survey 2006, 1,032 students were asked whether they considered themselves to be transgender: 1.6% of teenagers replied ‘yes’, 6.3% responded ‘Don't know’, and 5.7% skipped the question. In New Zealand, of 8,166 students asked, 1.2% reported being transgender, 2.5% reported being not sure about their gender, and 1.7% stated that they did not understand the question. These studies questioned students aged around 16 years of age. However, other smaller studies show prepubertal and adolescent children often do not have an accurate assessment of their eventual gender identity.

Internationally, individual clinics have observed an increasing number of referrals of individuals identifying as transgender, and this has been confirmed in at least one New Zealand clinic. Subsequently to the release of this report, Counties Manukau District Health Board published the Good Practice Guide for Health Professionals Gender Reassignment Health Services for Trans People within New Zealand.

It is not clear whether New Zealand has developed the adequate specialist resources to support people who identify as transgender. In order to determine this, we surveyed our colleagues on the availability of specialist services for the endocrine management of gender transition in the individual health regions in New Zealand. A summary of the responses is presented here. We also invited proposals for continuing medical education and development of local protocols for management. These will be provided to the relevant specialist societies.

Method

We contacted 100 specialists involved in the provision of advice and hormone prescriptions, and asked them to complete an online questionnaire on the services available to people identifying as transgender in their region. The questionnaire was available for completion between September and November 2014.

We wished to define the range of services available to, and therapies used by, clinicians in New Zealand. We also asked respondents to identify any practical barriers (or lack of barriers) to providing services. Specifically, our aims were:

1. to determine whether there were variations in management protocols for people who identify as transgender between specialists in sexual health medicine and endocrinology;
2. to assess the services available locally to assist individual specialist clinicians in the care of people who identify as transgender.

We aimed to approach all endocrinologists and sexual health physicians, as well as paediatricians, general physicians or general practitioners known to provide a secondary level service. As the relevant professional societies are a small community, it was felt likely we could identify most physicians active in the field.

We contacted members of the New Zealand Society of Endocrinology (NZSE), endocrinologists who might not be current...
members of the NZSE and the New Zealand Fellows of the Royal Australasian College of Physicians Chapter of Sexual Health Medicine (FACHSHM). We also contacted general physicians who see endocrine patients in individual regions, paediatricians known to be managing people who identify as transgender, as well as a general practitioner and a gynaecologist known to see individuals who identify as transgender. Our questionnaire asked respondents to identify any relevant local clinicians who might not be members of the societies, aiming to provide as comprehensive coverage of this level of care as possible. We found we had already contacted the few additional suggestions returned (n=6) that met our inclusion criteria.

The questionnaire was administered in two parts, sent by email simultaneously and hosted by Survey Monkey. The first (general questionnaire) asked for basic demographics, information on how patients who identify as transgender are generally managed, and about the consultants’ understanding of services available locally. The second questionnaire (clinical questionnaire) presented hypothetical clinical case histories and asked respondents to indicate how they would manage the case. All participants contacted were asked to complete the general questionnaire because we wanted to assess what clinicians who could potentially provide care, knew about the availability of services, even if they were not currently treating people who identify as transgender. Only those who currently saw people identifying as transgender were asked to complete the clinical questionnaire, as this survey included specialist questions that were likely to be outside the scope of practice for those not currently involved in the care of these individuals.

Identities of each respondent and their District Health Board (DHB) were required in order to assess the services for each region. However, confidentiality of each respondent and each DHB was maintained. Each respondent was given a unique code for identification. Coding and analysis of any links between items was carried out by one researcher (HD). Other team members were blinded to the identities of respondents and their specific DHBs. As several respondents or their DHBs would be readily recognised from tables of the completed analysis, results have been presented as descriptions of the overall findings for individual items and the contrasts between regions. The numbers of responses to individual items by clinicians, anonymised and independent of their DHB, can be requested from the authors.

The questionnaire included space for free-text comments on individual items or the topic overall. These have been collated, anonymised, and will be provided as verbatim feedback to the NZSE and the New Zealand Fellows of FACHSHM to facilitate continuing education within the individual professional societies. The results in this report address the majority of concerns raised by the individual clinicians in their free comments.

This study was granted ethical approval by the University of Otago Human Ethics Committee (reference number D14/285).

Results

Recruitment

A total of 100 physicians were invited to participate; this included 62 NZSE members known to practice in general endocrinology (ie, excluding specialist practitioners in diabetes), 5 endocrinologists who were not NZSE members, 18 sexual health physicians, 11 paediatricians, 2 general physicians, 1 general practitioner, and 1 gynaecologist known to be managing people who identify as transgender.

Respondents

Of the 100 physicians contacted, 62 responded: 53 answered the general questionnaire, and 38 the clinical questionnaire. This included 29 who answered both questionnaires, 24 who only answered the general, and 9 who only answered the clinical questionnaire. Basic demographics about the respondents can be seen in Table 1.

Coverage of DHBs

We were able to identify at least one specialist in 18 out of the 20 DHBs in New Zealand and at least one representative from each of these responded. Two specialists covered two DHBs and one specialist covered three DHBs.
Two DHBs had eight clinicians who see patients identifying as transgender and two had four. Six DHBs had two or three clinicians who see patients identifying as transgender and another six had only one. Two DHBs had a single respondent who did not see individuals identifying as transgender (data not shown).

About half the clinicians estimated that, individually, they had seen between one and five individuals in the previous year, while about one quarter had seen patients identifying as MtF, but had not seen any patients identifying as FtM in that year (Table 2). In total, 42 secondary level adult physicians estimated they saw 309 and 126 individuals identifying as MtF and FtM, respectively, in the 12 months previous to data collection.

We identified that 89% of individuals identifying as transgender were seen in five main areas, or ‘centres’. The centres were considered to be those with the potential for a coordinated group of physicians: the three Auckland DHBs (Auckland, Waitemata, and Counties Manukau DHBs); Waikato DHB; Wellington (Capital and Coast, Hutt Valley, Wairarapa DHBs); Christchurch (Canterbury DHB and South Canterbury DHB); and Dunedin (Southern DHB), as discussed below. The number of individuals (both MtF and FtM) seen in the previous year in each of these main centres ranged from 9 to 201. 

Physicians with long-term experience in the care of people who identify as transgender

We considered physicians as being ‘experienced in the field’ if they had been practising as a qualified physician in their speciality for more than 10 years and had more than 10 years’ experience of caring for people who identify as transgender. Ten of the 20 DHBs had a physician with this degree of experience, including five of the DHBs serving a population base of 300,000 persons or greater (Table 1).

Physicians access to mental health services

Most respondents said they would require a psychological assessment before starting hormone therapy. About 30% of respon-

Table 1: Profile of respondents.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Scope of practice</th>
<th>Length of practice (years)</th>
<th>Caring for people who identify as transgender (years)</th>
<th>Population base (x10³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>25</td>
<td>&lt;10</td>
<td>1</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Female</td>
<td>27</td>
<td>10–20</td>
<td>1–5</td>
<td>50–150</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>16</td>
<td>17</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>6</td>
<td>10–15</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>&gt;30</td>
<td>6</td>
<td>&gt;15</td>
<td>20</td>
</tr>
<tr>
<td>Total‡</td>
<td>52</td>
<td>53</td>
<td>41</td>
<td>52</td>
</tr>
</tbody>
</table>

†Data generated from the general questionnaire, n=53

Table 2: Estimated number of individuals identifying as MtF and FtM seen in the past 12 months by each physician (either for initial assessment or for ongoing supervision).

<table>
<thead>
<tr>
<th>Number of patients</th>
<th>MTF patients</th>
<th>FtM patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>1–5</td>
<td>24</td>
<td>20</td>
</tr>
<tr>
<td>6–10</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>11–20</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>&gt;20</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Missing entry</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>42</td>
</tr>
</tbody>
</table>
dents felt they would be able to see only a small minority of individuals identifying as transgender without a psychological assessment, and a further 24% stated that they required a pre-assessment in their clinical practice, and so would not see any patients without this (Table 3). This pattern was reflected in the clinical questionnaire where respondents were presented with a hypothetical case of a mature individual identifying as MtF, confident in her gender identity, but with the potential of disturbed marital and family relationships as she makes personal changes. In this case, 80% of respondents indicated they would not, or only possibly, provide hormone therapy before psychological assessment, 9% indicated they would or probably would, and 11% responded that they did not know (data not shown).

We asked respondents whether they have access to a psychological assessment for adults who identify as transgender who have no apparent psychological issue. We received responses from 42 physicians. Physicians in all the DHBs for which we received at least one answer to this question (n=14) responded that they have access to private sector psychological assessment, although one DHB also had one specialist who said there was not private access in his/her region. Five physicians did not know if there was private access for psychological assessment in their DHB (Table 4).

Access to psychological assessment for patients who identify as transgender in the public sector is less clear. Of the 40 respondents to this question, 17 felt they did not have access to publicly-funded assessment in their local region. In analysis of the responses within individual DHBs, 8 physicians in 5 DHBs reported no public access for psychological assessment, 7 physicians in 5 DHBs suggested that there was public access within their DHBs, and the physicians in the remaining 6 DHBs had conflicting answers. Five physicians did not know if there was public access for psychological assessment in their DHB (Table 4).

We then asked respondents whether they have access to a clinical psychologist or counsellor for ongoing support of uncomplicated adults who identify as transgender. The majority of the DHBs for which we received at least one answer to this question appear to have access to ongoing psychological support for their patients in the private sector, although 3 DHBs had conflicting answers to this question. In 4 DHBs, 5 physicians indicated that they had public access to ongoing psychological support, in 5 DHBs there was no public access according to the respondents, and a further 7 DHBs had conflicting answers.

Table 3: Number of clinicians who would provide therapy for an adult patient identifying as transgender in the absence of a current psychological or psychiatric assessment.

<table>
<thead>
<tr>
<th>Proportion of patients</th>
<th>Totals of responses from physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>No patient assessment required before consultation</td>
<td>Small minority of patients</td>
</tr>
<tr>
<td>No patient assessment required before consultation</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 4: Physician’s access to consultation for psychology evaluation and support for adults who identify as transgender who have no apparent psychological issue.

<table>
<thead>
<tr>
<th>Psychology assessment</th>
<th>Totals of responses from physicians (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Psychology assessment</td>
<td></td>
</tr>
<tr>
<td>In the public sector</td>
<td>18</td>
</tr>
<tr>
<td>In the private sector</td>
<td>28</td>
</tr>
<tr>
<td>Psychology/counsellor support</td>
<td></td>
</tr>
<tr>
<td>In the public sector</td>
<td>13</td>
</tr>
<tr>
<td>In the private sector</td>
<td>25</td>
</tr>
</tbody>
</table>
from within the DHB. In addition, 5 physicians did not know if there was public access to support and 7 did not know if there was private access.

**Hormone therapies**

**MtF transition**

The preferred therapies for adults undergoing MtF transition were queried in the clinical questionnaire. Of the physicians that answered this question (n=32), almost all (78% answered ‘yes’ or ‘probably’) would recommend cyproterone acetate initially, with increasing doses of oestrogen subsequently, and almost no physician uses combined oral contraceptives (one respondent answered ‘probably’) (data not shown).

**FtM transition**

Similarly, physicians were asked about which hormone therapy they preferred to use in the case of adults undergoing FtM transition. There was more variability in responses by the responding physicians (n=33) than for MtF therapies. Sustanon or Depot Testosterone was the preferred therapy (58% answered ‘yes’ or ‘probably’), followed by Androderm patches in low then increasing dose (21% answered ‘yes’ or ‘probably’) and Combined Lucrin (leuprolide) and testosterone (increasing testosterone dose sequentially) (18% answered ‘yes’ or ‘probably’) (data not shown).

**Surgical services**

The clinician’s awareness of the availability of surgical procedures for people who identify as transgender in their local DHBs is detailed in Table 5. In general, about half of responding physicians did not know of the availability of techniques locally. The majority of the other respondents were aware of services in the private, but not the public, sector.

When analysing the data by DHB, we found that there was some variation in the responses within DHBs. These discordant opinions would suggest that some clinicians are incorrect as to whether particular surgical procedures are available for people who identify as transgender within their DHB.

**Free commentary**

In the optional free commentary sections, 17 physicians discussed the desirability of a multidisciplinary team grouping; 11 discussed the frustrations of limited support from other specialities—particularly mental health—at a regional level; 15 expressed concern at a lack of psychological services locally; 6 discussed ways to improve training and experience; 29 were generally positive about the value of standardisation of therapy protocols in New Zealand, with some saying overseas guidelines were sufficient.

**Discussion**

Our respondents confirmed that, while there are a relatively small number of specialists available to manage hormone therapies for individuals who identify as transgender, there is at least one specialist in almost every DHB area. There has been an increase in the number of people who identify as transgender who have been referred for hormone therapy in recent years in New Zealand and overseas. This

<table>
<thead>
<tr>
<th>Table 5: Surgical services available locally.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MtF surgery available locally</strong></td>
</tr>
<tr>
<td>Male to female</td>
</tr>
<tr>
<td>Public</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Orchidectomy</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>Breast reconstruction</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>Vocal cord remediation</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>Facial surgery</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>Body or facial hair removal</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td><strong>FtM surgery available locally</strong></td>
</tr>
<tr>
<td>Female to male</td>
</tr>
<tr>
<td>Public</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Mastectomy</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Hysterectomy</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>Endometrial inhibition</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>Oophorectomy</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

Values are number of respondents
trend will have health resource implications for this population group.

There were significant barriers to care in many regions, although these were much less for the individuals who could afford psychology assessment, counselling or surgery in the private sector. We could not assess the reasons for the discrepancy between the availability of secondary level hormonal therapy and both psychological and surgical services in many areas. However, it is apparent that many endocrine and sexual health clinicians are not prepared to provide hormone therapy in the absence of a psychological assessment. This, combined with restricted psychological services in the public sector, seems to present a significant barrier to referral.

Despite the findings of the Human Rights Commission in 2008, and the local availability of surgeons for orchidectomy, mastectomy, hysterectomy and oophorectomy, the survey results suggest that most DHBs do not support surgical therapy in the public sector for relevant individuals who identify as transgender. While this study did not collect systematic data on the underlying reasons for this, one contributing factor may be the issue of surgical priorities, with local surgical guidelines placing little weight on gender reassignment procedures. In its update on the Standards of Care for people who identify as transgender, the World Professionals Association for Transgender Health (WPATH) states:

“The medical procedures attendant to sex reassignment are not “cosmetic” or “elective” or for the mere convenience of the patient. These reconstructive procedures are not optional in any meaningful sense, but are understood to be medically necessary for the treatment of the diagnosed condition.”

Our results suggest that psychological and surgical services are less accessible via the public system compared with the private system, meaning those with lower socioeconomic status will be disadvantaged. This will likely lead to further health inequality and poorer health outcomes for these individuals as people go without the health care they need, or resort to alternative sources of treatment. In the DHBs where there were several physicians responding, there were differences reported on the availability of services, and up to half of respondents flagged ‘Don’t know’ for whether surgical procedures were available locally. As most physicians are seeing fewer than six individuals who identify as transgender annually, and as many individuals may not require surgery or counselling, this may simply reflect differences in clinical experience. This highlights the potential value of each region providing information on the availability of services, or ‘pathways’ for referral and management of individuals who identify as transgender, and clearer communication to clinicians of what surgical procedures are available for their patients. These were recommendations from the Human Rights Commission.

Limitations of this study

In requesting the opinions of specialists involved in care of these patients, we have been able to highlight issues but not be definitive on the extent of problems or reasons for them.

The limited number of clinicians involved in the care of people who identify as transgender represents a disadvantage in the number of opinions provided and may be a reflection on a limitation of resources available for this subspecialty, at least in some DHBs. However, it also enabled us to be comprehensive in approaching specialists active in the field and we received a response rate of 62%. Several areas had no dedicated endocrine service but had clinics provided by visiting specialists from either the endocrine or sexual health fields. In addition, general practitioners are likely to have been providing therapy to individuals (who do not wish to have hospital involvement in their management) without our knowledge.

We contacted several paediatricians (11) whose practice has a special focus on endocrinology, but did not approach general paediatricians as a group. The clinical survey included cases only at age 17 and 18, as these are more likely to present to general endocrinologists. Two paediatric specialists responded and discussed only those issues relevant to their practice. People who identify as transgender do present both
before puberty and in adolescence. These patient groups present particular challenges for assessment and management which are less relevant in the adult population. A separate approach to this group of specialists may therefore be warranted.

The estimates of the number of patients who identify as transgender seen by individual clinicians throughout the previous year are indicative only. A more accurate figure would be provided by a prospective record. Furthermore, the numbers do not provide an estimate of the numbers of individuals who identify as transgender in New Zealand. For example, many such individuals may not seek hormone therapy. Given that the future trends in transgender medicine are not clear, there would be an advantage in individual clinics maintaining a prospective audit of the number of patients seeking care to assist a review of outcomes in the longer term. However, outpatient assessments may not be captured by hospital coding. This would therefore require individual clinicians to monitor patient numbers, which would necessitate additional infrastructure support.

To further inform service provision for individuals who identify as transgender, a qualitative study would be beneficial. Speaking with individuals who identify as transgender to discover their needs and what they perceive to be the main barriers to healthcare would help to improve services, as well as provide a more full understanding of the impact current practice and policy has on their lives.

Our results support the development of specialist management services for people who identify as transgender in tertiary centres in New Zealand. There were at least six DHBs where, together with their adjacent DHBs, there was at least one ‘experienced physician’ in the field, with three or more colleagues seeing individuals who identify as transgender. We would propose that their local DHB administrations develop these centres to facilitate a consultative service for the local and adjacent DHBs with ongoing management of individual cases generally remaining the responsibility of the local physician. These ‘centres of excellence’ could involve local input from—and clinical collaboration between—interested secondary level specialists in sexual health, endocrinology and mental health. These might have an informal grouping rather than a formal combined clinic.

The group could define referral pathways, assist in developing criteria for care, provide experience for postgraduate trainees, liaise with relevant local gender support groups, and provide increased support for primary care clinicians. However, to provide this approach, it seems likely individual DHBs would need to acknowledge the value of mental health input to care services for people who identify as transgender and include transgender issues in their funding for secondary level services. Mental health funding in DHBs is ‘ring-fenced’ in a separate category to other specialties. It is not clear to the authors if this excludes responsibility for assessment of individuals who identify as transgender who do not have a specific psychiatric diagnosis.

It also seems appropriate for the three relevant professional societies to plan joint postgraduate meetings and consider a working group to foster services for the care of people who identify as transgender within groups of DHBs. We would expect local meetings to link with the paediatric service, the primary care sector, relevant general practitioners and practice nurses, counsellors and psychologists, as well as engaging and consulting with the transgender community working groups.
ARTICLE

Competing interests:
Nil

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URL:

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Management of postmenopausal bleeding by general practitioners in a community setting: an observational study

Monique Stravens, John Short, Karyn Johnson, Bryony Simcock, Brett Shand, Graham McGeoch, Peter Sykes

ABSTRACT

AIM: To evaluate the safety and effectiveness of a clinical pathway for investigation of postmenopausal bleeding (PMB), managed primarily by general practitioners. Women with an endometrial thickness (ET) ≥5mm on transvaginal ultrasound (TVUS) require either a pipelle biopsy in primary care or referral for specialist care.

METHOD: Data on 241 women with PMB were reviewed retrospectively over a 5-year follow-up period. Twenty-five women were excluded as they did not satisfy PMB clinical pathway criteria.

RESULTS: TVUS showed 121 women had an ET <5mm, 83 an ET ≥5mm, and 12 an endometrial polyp. In the women with ET ≥5mm, 38 had a pipelle biopsy performed in primary care, 36 were referred directly to secondary care, and 9 declined further investigations. Only 17 pipelle biopsies provided sufficient tissue, with the remaining 21 women referred to secondary care. Seven cases of endometrial cancer were identified, 4 by pipelle biopsy and 3 by hysteroscopy. Of the study cohort, 68% were managed solely by their general practitioner to the point of diagnosis, while 81% with an ET ≥5mm required management in secondary care at some stage. No further cases of endometrial cancer were identified in reviews of patient medical records and cancer registries.

CONCLUSION: Community-based investigation of PMB is an alternative model of care with no evidence of additional risks to the patient. Targeted education of general practitioners on pipelle biopsies is essential to maximise the effectiveness of the pathway.

Post-menopausal bleeding (PMB) represents an absolute indication for specialist gynaecological investigation because of the underlying risk of endometrial cancer, estimated at 10%. The aim of clinical management of PMB is to achieve an accurate diagnosis without over-investigation.

In recent years, newer methods of investigation of PMB, such as transvaginal ultrasonography (TVUS), endometrial biopsy, and hysteroscopy, have superseded dilation and curettage (D&C). Most guidelines use an endometrial thickness (ET) of ≥5mm measured by TVUS to indicate an increased risk of endometrial cancer in post-menopausal women, with conservative management recommended for those with an ET <5mm. Further invasive diagnostic testing is indicated in all women with a ‘thin’ endometrium on TVUS and ongoing or recurrent bleeding.

Women with an ET ≥5mm need an endometrial biopsy. This can usually be carried out as an office procedure as it requires minimal or no cervical dilation and no anaesthesia. In addition to being more convenient and less stressful for patients, the cost of the biopsy is considerably less than a hospital D&C. Evidence from a meta-analysis showed outpatient endometrial biopsies reduced the time to treatment and had a high diagnostic accuracy for endometrial cancer when an adequate specimen was obtained.
Figure 1: Postmenopausal bleeding pathway in HealthPathways.

- **Patient presents with symptoms**
- **Pelvic exam and take a smear**

  - **Appearance of vagina and cervix normal apart from atrophic vaginitis?**
    - No → **Request gynaecology assessment or manage as cervical polyps**
    - Yes → **Arrange ultrasound**

  - **Polyps present?**
    - Yes → **Request hysteroscopy**
    - No → **Thickness of endometrium?**
      - Less than 5 mm → **No further treatment other than for atrophic vaginitis**
        - Yes → **Review in 2 months**
      - 5 mm or more → **Arrange pipelle sample**
        - Histology adequate?
          - No → **Request hysteroscopy**
          - Yes → **Carcinoma or hyperplasia?**
            - No → **Further bleeding?**
              - Yes → **Request hysteroscopy**
              - No → **Continue treatment for atrophic vaginitis**
            - Yes → **Is endometrium 5 to 8 mm?**
              - No → **Further bleeding?**
                - Yes → **Continue treatment for atrophic vaginitis**
                - No → **Treat atrophic vaginitis and review in 2 months**
Until 2008, women with PMB in the Canterbury region of New Zealand were referred directly for specialist gynaecological investigation that included a TVUS with or without a D&C. Around that time, the Canterbury District Health Board—through a proactive group called the Canterbury Initiative (http://www.canterburyinitiative.org.nz)—introduced several programmes to integrate health services, and to transfer some services to the community that had traditionally been carried out by hospital specialists. This involved developing clinical pathways for various conditions, including PMB. These pathways provided locally relevant patient-centred models of care in line with international best practice guidelines. For dissemination, these pathways were placed on a local clinical guidance website called HealthPathways (http://www.cdhb.health.nz/Hospitals-Services/Health-Professionals/Pages/Health-Pathways.aspx).

As shown in Figure 1, the Canterbury District Health Board clinical pathway for PMB involves an initial examination followed by TVUS. If ET is ≥5mm, an endometrial biopsy, performed by an appropriately trained general practitioner, is organised. Depending on the histology report of the biopsy the patient either remains on the pathway (ie, normal report) or is referred for specialist review (ie, abnormal histology or inadequate sample). Women with findings suggestive of focal endometrial abnormalities, such as polyps, are referred directly for specialist management. The pathway recommends general practitioners review the patient after 2 months and, should symptoms persist, arrange for specialist review. Failure to identify any further investigations in women with an ET ≥5mm in ongoing clinical safety audits leads to the general practitioner being contacted to determine the reason for the lack of follow-up.

Because the PMB pathway represented a substantial change from historical practice, it was considered necessary to review the practicability, effectiveness and safety of the management protocol. This paper describes the findings of a review of 241 women with PMB investigated according to the pathway over a 1-year period, with a 5-year follow-up period to check for the presence of subsequent endometrial carcinoma.

Patients and methods

All women in Canterbury referred through the publically-funded Community Referred Radiology programme between 1 October 2009 and 30 September 2010 for investigation of PMB by TVUS were identified (n=241). Ethical approval for review of the women's electronic and paper medical records was obtained from the regional Ethics committee. Data collected included age, ethnicity, time from LMP, TVUS reports (type of scan, duration from request to scan, gross findings and ET), pipelle biopsies (proportion of adequate biopsies and histology), and gynaecological investigations over the 1-year period following TVUS (conservative management, hysteroscopy or hysterectomy). A review of the National Cancer Registry was carried out 14 months after enrolment in the study to determine if any of the women had been subsequently diagnosed with endometrial or any other gynaecological cancer. This review was extended to a follow-up period of 5 years by searching the Local Cancer Registry in 2015 and reviewing the patient's electronic medical and laboratory records.

The data were anonymised and entered into a secure electronic spreadsheet for analysis. In accordance with the pathway, the data were examined as two groups using an ET cut-off value of ≥5mm. The primary outcome measure used to assess the safety of the pathway was the number of cases of endometrial cancer missed in patients commenced on the pathway. The secondary outcomes used to assess the effectiveness of the pathway were the proportion of successful pipelle biopsies carried out by general practitioners, the proportion of women requiring specialist management and waiting times for the investigations of PMB.

Results

The gynaecological procedures and outcomes in the study cohort are shown in Figure 2.

A total of 25 women were excluded from the study cohort. The reasons for exclusion were: 9 did not attend the TVUS
appointment; 7 were not post-menopausal; 7 were on hormone replacement therapy (none on tamoxifen); and 2 with recurrent PMB were considered to be perimenopausal and had a mirena inserted. The mean age of the remaining 216 women was 59 years (range 40–91 years), 88% of whom were New Zealand European, 5% Asian, 4% Māori, and 3% Pacific Islander. Information on the time since the LMP was included in only 65 (30%) of the referrals (mean, 4.0 years; range, 1–30 years).

TVUS showed that of the 216 women, 83 (38%) had an ET ≥5mm, 121 (56%) had an ET <5mm, while 12 (6%) were found to have polyps and were referred directly for a hysteroscopy. Other endometrial abnormalities identified by TVUS included fibroids (n=70), cysts (n=28), and adenomyosis (n=8).

In accordance with the clinical pathway, the 83 women with an ET ≥5mm required further investigation, with 38 (46%) having a pipelle carried out by a general practitioner. Only 17 of these pipelle biopsies (45%) provided sufficient tissue for histological diagnosis. Four cases of carcinoma, 2 of hyperplasia, and 4 of endometrial proliferation were identified, with these 10 women referred to secondary care for further management. The remaining 7 women had normal histology and were returned to their general practitioner for management.

The 45 women with an ET ≥5mm who did not have a general practitioner pipelle, and the 21 women with inadequate histology, were referred to secondary care for further investigations and management. A further 3 cases of endometrial carcinoma were identified in the women referred directly to secondary care, and 2 cases of hyperplasia (1 simple and 1 atypical) in the women with inadequate GP pipelle biopsies.

A summary of clinical management carried out in primary or secondary care during the 1-year follow-up period and the histological findings of the 83 women with an ET ≥5mm is shown in Figure 3. Of the 83 women, 7 (8%) were managed solely in primary care, 67 (81%) in secondary care at some stage during the follow-up period, while 9 (11%) women either declined further investigations or were seen by a private gynaecologist. Twelve women had a pipelle as the first line of ongoing investigation in secondary care, 8 of whom subsequently had a hysteroscopy.
All 121 women with an ET <5mm were managed initially in general practice. As shown in Figure 4, 15 of these women were referred to secondary care for further management within the next year. This included 8 hysteroscopies (5 recurrent PMB and 3 abnormal findings on a repeat prolapse) and 7 hysterectomies (1 hyperplasia, 4 prolapse, 1 multiple fibroids, and 1 ovarian mucinous tumour). The remaining 106 women continued to be managed conservatively in general practice, with a record of repeat TVUS or routine cytology in 79 cases.

Therefore, of the 204 women in the study, 138 (68%) avoided referral to secondary care and were managed entirely by their general practitioner to the point of diagnosis. This included the 10 women with an adequate pipelle sample who were diagnosed with either endometrial carcinoma or abnormal histology.

The median waiting times for the procedures were general practitioner referral to TVUS 13 days (interquartile range [IQR] 8–21 days), and for women with an ET ≥5mm, referral to general practitioner pipelle biopsy 29 days (IQR 15–59 days), and referral to first specialist assessment 54 days (IQR 35–80 days). For the women with a confirmed cancer diagnosis, the median time from referral to hysterectomy was 55 days (range 42–90 days) for those who had a general practitioner pipelle biopsy, and 88 days (range 81–98 days) for those who had a hysteroscopy in secondary care.

No additional cases of endometrial cancer were identified in the study cohort.
Figure 4: Management in women with an ET <5mm (n=121).
in the 1-year review of the National Cancer Registry, and 5-year follow-up of the Local Cancer Registry and medical and laboratory records.

Discussion

The advent of simple devices for obtaining endometrial biopsies without general anaesthesia has resulted in an increasing number of biopsies being carried out in primary care.\textsuperscript{10,11} The current study evaluated a clinical pathway for PMB that included the option of an endometrial biopsy carried out by a general practitioner based on the results of TVUS. Because low grade and early stage endometrial cancers have an indolent natural history, we used a relatively long period of follow-up to evaluate the safety of the clinical pathway.

The study showed that the pathway was a safe model of care. Follow-up over a 14-month period using the National Cancer Registry, and 5-year period using the Local Cancer Registry and medical and laboratory records showed no cancer diagnosis was missed in the study cohort. The importance of ongoing monitoring of symptoms and repeat investigation in the PMB clinical pathway was emphasised by the finding of endometrial hyperplasia in a small number of women investigated in secondary care. The incidence of cancer in the study group (3.2%) was considerably lower than the established rate of 10%.\textsuperscript{1} This low rate may have been attributable to the fact that all woman referred for community TVUS for investigation of PMB were enrolled in the study. Because information on LMP was provided in only one-third of the women, it is possible peri- and pre-menopausal women may have been included in the study cohort.

How do the outcomes of the clinical pathway on HealthPathways compare with other services described in the literature? The median time from referral to final diagnosis was 42 days (referral to scan = 13 days and scan to pipelle = 29 days). The waiting times for hysterectomy for 3 of the 4 women with endometrial cancer identified by a general practitioner pipelle biopsy were within the 62-day guideline of the Faster Cancer Treatment Programme of the Ministry of Health, New Zealand,\textsuperscript{12} and were of shorter duration than for women who required specialist management. However, of the 38 pipelles attempted by general practitioners, 21 (55%) did not allow histological diagnosis due to 7 technical failures and 14 yielding insufficient tissue, thereby requiring referral to secondary care and a small delay in diagnosis. This relatively high rate of inadequate biopsies is greater than that reported by other studies for primary care clinicians which range between 13–31%.\textsuperscript{8,13-15} This high rate may reflect, in part, the fact that biopsies are often more difficult to obtain in post-menopausal women, mainly because of endometrial atrophy. It is relevant to note that specialist clinicians also had difficulty obtaining diagnostic samples in a small number of women in our study cohort. Clinical audits of the PMB clinical pathway carried out annually since the study period have shown similar inadequacy rates for the general practitioner biopsies, although there has been a trend towards a reduced rate in recent years (2011, 47%; 2012, 54%; 2013, 38%; 2014, 35%). Our results indicate targeted education programs for general practitioners on endometrial biopsy techniques may be necessary to reduce the rate of failed or inadequate biopsies.

In our study, approximately one-half (45%) of the women suitable for a general practitioner pipelle were referred directly to secondary or private care. The reasons for these direct referrals may include sampling being limited by a high body mass index (BMI) or another gynaecological problem, while 4 women declined a pipelle, requesting hysteroscopy instead. It is possible this relatively high rate of referral for secondary care may have affected the results of our analysis and the perceived benefits of the pathway. Notwithstanding this possibility, approximately two-thirds of the study cohort were managed entirely in the community by their general practitioner, equivalent to a potential saving of about 140 first specialist appointments. In comparison, an earlier ‘in-house’ safety audit of hospital-based services showed approximately 63% of women with PMB who had a pipelle biopsy required referral to secondary care, with about 50% requiring a hysteroscopy as they had an ET >8mm.

Despite numerous studies comparing the effectiveness, safety and acceptability
of methods for investigating PMB and detecting malignant pathology, there is still no consensus on the most accurate and efficient diagnostic clinical pathway. An important finding of the current study was the relative contributions of TVUS and endometrial biopsy towards the diagnostic process. Although a large number of women were able to be managed without referral to secondary care, it is clear that this benefit was attributable mainly to the initial TVUS. The additional information provided by a pipelle carried out in the community was of less benefit. Although pipelle biopsies carried out in the community appeared to be a safe and time efficient method for investigation of PMB, the fact that over three-quarters of the women with a thickened endometrium required referral to a specialist gynaecologist raises questions as to the effectiveness of this approach. It is possible a pathway that includes specialist referral for all women with PMB and an ET ≥5mm may be more appropriate, or alternately, that the resources required to support such a pathway may be better utilised to establish a ‘one-stop’ PMB clinic, as suggested in other papers. However, in a constrained health system with limited access to specialist gynaecology, the pathway described in this paper reduced the demand on secondary services. Another advantage of a clinical pathway involving a pipelle biopsy in primary care is that access to geographically convenient specialist care may not always be available in rural or smaller communities.

This study had several limitations. Because it was a retrospective design it is possible some selection bias may have occurred. The study cohort was relatively small, although because withdrawals from the pathway were low at approximately 10% and follow-up data was available for the majority of women, we consider the conclusions are applicable to current practice. The study did not, however, evaluate the cost effectiveness of the pathway—suffice it to say, that the cost of TVUS and a pipelle biopsy is considerably less than a hysteroscopy. TVUS should cost the same in a community setting as in a hospital, and therefore any additional costs are incurred downstream. Our review also did not evaluate the cost and time involved to carry out a safety audit to ensure all women with a thickened endometrium receive adequate follow-up.

Conclusions

The findings of this study suggest that the clinical pathway disseminated on HealthPathways is a safe and promising alternative model of care for women with PMB that does not expose them to the risk of undue delay or missed diagnoses of endometrial cancer. The pathway enables women with potentially serious gynaecological problem to receive specialist care, and for those with a endometrial cancer diagnosed by pipelle, the potential to fast track care.

However, there are potential concerns regarding the efficiency of this pathway, mainly regarding the high inadequacy rate of pipelle biopsies carried out in primary care, requiring further investigations in secondary care. This indicates that targeted education of general practitioners on pipelle biopsies is necessary. The issues of cost effectiveness and patient satisfaction of the pathway also warrant further study.
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Competing interests:
Nil

Acknowledgements:
This study was funded by the Canterbury Initiative. The authors would like to acknowledge the following people who assisted with data collection: the staff of Canterbury Radiology Group, Canterbury Medical Imaging, Med Lab South and Southern Community Laboratories; and Robert Hipkiss, Information Analyst, Ministry of Health. We are also grateful to Dr Nikki Elliot, Canterbury Initiative for her assistance with preparation of the manuscript.

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Supervision for superheroes: the case for reflective professional supervision for senior doctors

Helen Austin

ABSTRACT
The practice of medicine is inherently stressful with regular exposure to trauma and the distress of others. There is a culture in medicine that doctors should not be affected by such things, although it is well recognised that doctors have higher rates of depression, anxiety, suicide, and substance abuse than the general public. Reflective professional supervision is a forum where the complexities of the interpersonal interactions that underpin the provision of healthcare can be explored in a supportive and confidential setting. It is argued that this is a process that should continue for the duration of a doctor's career, with potential benefits including enhanced job satisfaction and resilience, better workplace communication and improved interpersonal skills.

Professional supervision is a process that is not well understood, and is under-utilised by those in the medical profession, especially among those in the hospital-based specialties. Colleagues in other helping professions have a long history of engaging in professional supervision, and for disciplines such as social work and psychology, attendance at supervision is mandatory to maintain registration. Other helping professionals (e.g., school principals, church ministers, probation officers) are now also beginning to utilise supervision, so why not doctors?

It would seem that among doctors there is a lack of understanding as to what reflective professional supervision entails. There are many different types of supervision with different functions and formats and some confusing terminology. The supervision with which most doctors are familiar from their years in training tends to be hierarchical in nature, and focused on the technical and educational aspects of medicine, with functions of oversight and assessment. This form of supervision is a requirement for junior doctors, but once specialist qualifications are obtained it often comes to an end.

There is a common misperception that supervision is only for those who are still in training, or for those who are somehow lacking or incompetent. To the contrary, a willingness to engage in supervision and explore vulnerabilities requires strength, maturity and commitment.

Senior doctors may engage in peer review, but that again tends to focus on the technical aspects of health care, with little emphasis on the emotional impact of medicine. The environment of peer review may also be competitive due to the personality types that medicine can attract, and is often not conducive to exposing vulnerabilities.

Medicine can be a rewarding career, but it is also inherently challenging and stressful. The higher rates of depression, anxiety, substance abuse and suicide amongst doctors compared to the general population are well recognised by the profession, as noted in the New Zealand Medical Association position statement on Doctor's Health, Wellbeing and Vitality.¹ Doctors are exposed to a number of stressors, including heavy workloads, long hours, limited resources, time and administrative pressures, high expectations, public accountability and the risk of complaint. Doctors across the range...
of specialties are also exposed to the pain, distress, trauma and suffering of patients and their families on a daily basis. This can have a cumulative effect on medical professionals known as vicarious trauma or secondary traumatic stress, an experience that many doctors may be aware of, but may not be able to name. Vicarious trauma was first described in 1990 by Pearlman and McCann and refers to the changes in cognition, perception and world view that can arise as a result of repeated exposure to the distress and suffering of others. If not recognised and managed appropriately with the use of processes such as professional supervision, the cumulative effects of stress and exposure to trauma may impact upon practice, and may adversely affect relationships with colleagues, patients, partners and families.

So what is professional supervision? Supervision is a process that provides the opportunity for reflective practice. It is a confidential space in which to step back, or take a pause from practice to reflect upon work-related issues and the impact that they may be having on the individual, either personally or professionally. It can also be a place to reflect upon the values and passion that lead to a career in medicine and to ensure that these things have not been forgotten or subsumed. Procter described the functions of professional supervision as formative (ie, professional development), normative (ie, administrative) and restorative (ie, supportive).

Supervision may be provided from within an organisation or by an external provider. Supervision may be conducted by peers or by a professional from another discipline. A model of peer supervision may be more acceptable to doctors, but it is imperative that the supervisor (whatever their discipline) receives appropriate training in the provision of supervision. One of the key elements for effective supervision is the relationship that develops between the supervisor and the supervisee, which should be characterised by trust, openness and honesty.

Supervision should be a structured process that is collaborative in nature, and typically involves meeting for an hour once a month. The supervisee is encouraged to bring topics for discussions that are then explored in some detail. These may include difficult interactions with patients or families, conflict with colleagues or junior staff or organisational issues. Ethical dilemmas may be explored, as may situations where things have gone well. While it is important that supervision does not turn in to counselling, personal issues that are impacting on work performance can be discussed, as can the impact that work situations may have on home and family life.

Supervision can utilise a range of different models. Dr David Owen, chair of the professionalism advisory group in the Faculty of Medicine at the University of Southampton, has described “The Five Realms” as a model for supervision in the medical profession. This looks at all aspects of the clinical relationship, with the five realms being the realm of the illness, the realm of the patient (and their family), the realm of the doctor (including aspects of the doctor's relationship with the patient and their colleagues, their work and home environment and their personal well-being), the realm of the supervisory relationship (eg, patterns which emerge in supervision may reflect general patterns of interactional style), and the realm of the organisation or cultural context in which practice occurs. This model enables a broad exploration of different aspects of the doctor’s work from a range of varying perspectives. A feature of good quality supervision, as noted by The London Deanery, is that aspects of the supervisory relationship can mirror aspects of the doctor/patient relationship. Skills and attributes that contribute to effective supervision may be similar to those that characterise effective patient consultations (eg, curiosity, compassion, honesty, thoughtfulness, respect and collaboration).

So what are the likely barriers that may prevent doctors from engaging in professional supervision? Unfortunately, stigma is likely to be a significant factor. In spite of public education campaigns aimed at destigmatising mental health issues, such as Like Minds, within the medical profession and the wider community, there remains significant stigma towards mental health issues and the discomfort that doctors have in seeking help is well recognised. In order for doctors to begin to acknowledge that they may be vulnerable to the stress and emotional load...
of providing health care, there would need to be a major cultural shift within the medical profession. Education on vicarious trauma and the need for self-care/self-awareness needs to be emphasised from very early on in the doctor's career, and initiatives such as Year 6 medical student mentoring would seem to be a step in the right direction.

Another potential barrier is the perception among doctors that as professionals we are superhuman and somehow immune to the adverse effects of exposure to trauma and distress. In the same way that the recent Association of Salaried Medical Specialists (ASMS) survey found high rates of presenteeism, with “superhero” doctors turning up for work even when unwell, there is a widespread view that doctors should not be emotionally or psychologically impacted upon by the nature of their work. Keeping a “professional distance" somehow acts as an invisible protective cloak for the superhero doctor. Exposing weakness or vulnerability may be viewed negatively, with fears that this may impact upon career progression or registration. Many clinicians refer to being able to box things away, or compartmentalise, but over time things tend to seep between these artificially constructed compartments, or else express themselves in other negative ways, such as substance abuse.

Lack of organisational support may be another barrier, and the widespread implementation of professional supervision among the medical profession would be a substantial cost in terms of both money and time for supervisor and supervisee. However, under health and safety legislation there is a requirement for employers to address workplace stress. If an employer does not adequately address workplace stress, then they may face legal action under the Health and Safety in Employment Act 1992. Encouragement of the use of professional supervision at an organisational level could be viewed as a proactive approach to managing and protecting staff wellbeing. This is beginning to be recognised in the legal profession, another group with high rates of mental health and substance abuse issues. In Australia, the County Court of Victoria has introduced the Supporting Judicial Resilience Program, a pilot program that provides judges with regular professional supervision in recognition of the potential negative effects of stress and exposure to traumatic material.

It may be argued that professional supervision is a process that should continue for the duration of a doctor's career. Over time, the primary focus of supervision may change from dealing primarily with clinical issues, to exploring the more subtle and complex nature of interpersonal interactions that are inherent in all areas of medicine. Communication issues are at the heart of many complaints involving clinical care and often contribute to difficulties within the multi-disciplinary team. Bullying in the workplace, as reported by the Resident Doctor's Association, is a serious issue that the profession needs to address, and is reflective of problematic interpersonal relationships. Exploring difficult interactions in detail in a safe supervisory relationship may help cast a different perspective on challenging situations and alternative actions and responses may be formulated.

In terms of the evidence base, while professional supervision would intuitively seem to be a helpful process, it does need to be acknowledged that this is an area that requires further well-conducted studies. There have been a large number of studies published, mainly within the nursing and allied health professions, but there are difficulties defining supervision and controlling for the content, process and quality of supervision. Difficulties also arise in determining and measuring appropriate outcomes. A recently published Cochrane Review reported on a systematic review of the literature that looked at the impact of clinical supervision on counsellors and therapists, their practice and their clients. The authors concluded, “supervision appeared to have a positive impact on therapist self-awareness, skills, self-efficacy, theoretical orientation, support and to some extent outcomes for clients, but the quality of the data was variable". Very few studies have been identified which explore the role of professional supervision in doctors, which is likely to reflect the limited uptake of supervision by the medical profession, and this is clearly
an area that requires further research. A structured pilot programme to evaluate the impact of professional supervision on a group of doctors may be helpful in terms of progressing the argument for more widespread use of this process.

The role of regular professional supervision for all doctors is worthy of further consideration, and measures to enhance doctor’s wellbeing and resilience should be prioritised. A willingness by senior doctors to reflect on practice and to expose their vulnerabilities by engaging in professional supervision would set a positive example to our junior medical colleagues, and to other members of the multi-disciplinary team. By becoming more compassionate towards ourselves, we can become more compassionate towards our patients, our co-workers and our junior doctors. A better understanding of the subtleties and complexities of the interpersonal interactions involved in the provision of health care may also help put the patient back at the centre of clinical care and may help re-establish some of the art of medicine.

Competing interests:
Helen Austin reports to have a small private practice offering professional supervision to other professionals.

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Artificial intelligence in medicine: humans need not apply?
William Diprose, Nicholas Buist

ABSTRACT
Artificial intelligence (AI) is a rapidly growing field with a wide range of applications. Driven by economic constraints and the potential to reduce human error, we believe that over the coming years AI will perform a significant amount of the diagnostic and treatment decision-making traditionally performed by the doctor. Humans would continue to be an important part of healthcare delivery, but in many situations, less expensive fit-for-purpose healthcare workers could be trained to ‘fill the gaps’ where AI are less capable. As a result, the role of the doctor as an expensive problem-solver would become redundant.

The increasing economic demands of the growing and ageing population on our already overburdened healthcare system make our current model of care unsustainable. Novel ways of delivering care are needed, and consequently, there is growing interest in using artificial intelligence (AI) to aid medical decision-making. However, the impact of AI on the future landscape of medicine remains unclear. We briefly explore how, in the coming decades, the traditional role of the doctor will be challenged by AI in a) autonomously performing diagnosis, and b) autonomously making treatment decisions.

Artificial intelligence in other industries
Driven by the economic benefits of tireless labour, machines have been replacing human workers since the industrial revolution. Historically, tasks such as manufacturing have been most susceptible to automation. However, due to recent advances in computing, such as machine learning, cognitive tasks, such as decision-making, are becoming increasingly susceptible to automation through AI. In fact, with the exponential nature of technological advances, almost half of current jobs in the US are considered as ‘high-risk’ of technological unemployment over the next one to two decades. A range of industries are being affected by AI, from technologies such as self-driving cars through to software that writes plain English news stories from structured data.

Artificial intelligence in medicine: automated diagnosis and treatment decisions
Turning to the healthcare industry, to what extent will AI be able to carry out the cognitive tasks traditionally performed by doctors?
The British Medical Association states that diagnosis “largely differentiates doctors from other health professionals.” However, this ‘unique’ role of diagnosis is ultimately a pattern-recognition algorithm. Information is gathered, synthesised, and compared with predefined categories we call diseases. If a patient’s pattern of symptoms, signs and test results match that of a known disease, then we classify and treat them accordingly. Clearly, this process could be performed by an appropriate AI.
Indeed, IBM have already created an AI known as Watson, that is able to perceive, ‘understand’, and make decisions based on natural language. In addition to defeating the champions of Jeopardy! (An American
television game show competition in which contestants are presented with general knowledge clues in the form of answers, and must phrase their responses in the form of questions), it is used at Memorial Sloan Kettering Cancer Centre to aid diagnosis and produce management plans for oncology patients. In contrast to humans, who can only learn from personal experience, Watson synthesises information from millions of medical reports, patient records, clinical trials and medical journals. Furthermore, Watson does not eat, sleep, go on holiday, or get sick.

According to principal investigator, David Ferrucci, Watson is already “out-diagnosing” medical residents in certain situations. Similarly, Isabel—a web-based clinical decision support system (CDSS)—suggested the correct diagnosis in 96% of 50 consecutive cases published in the *New England Journal of Medicine*. This is comparable with human doctors, who have been shown to make the correct diagnosis in 95% of outpatients.

Notably, medical specialties that utilise images for diagnosis are particularly amenable to appropriation by AI. This is exemplified by an algorithm that ‘learned’ from a database of normal and abnormal images to diagnose and classify diabetic retinopathy as accurately as human doctors. Similarly, when applied to a dataset of 340 brain magnetic resonance images, an algorithm developed at the University of Malaya classified images as either ‘healthy’ or ‘diseased’ with 100% accuracy. Even aspects of the physical examination can be performed by AI, with a computer-vision algorithm classifying a group of 55 patients as either ‘healthy’ or ‘Parkinson’s disease’ based on automated analysis of handwriting with 79% accuracy.

Although these solutions are intended to be physician assistants as opposed to physician substitutes, these findings have huge implications for us because diagnosis, our defining role, could be performed better, faster and more inexpensively by AI in the near future. If nothing else, these findings suggest that AI could substitute for human diagnosis in ‘visual’ medical specialties such as radiology, pathology, dermatology and ophthalmology in the very near future.

Following diagnosis, the doctor and patient must decide on appropriate treatment. This process relies on the doctor applying their clinical acumen to a particular problem, in combination with available evidence and patient preferences. In the same way as making a diagnosis, the process is largely algorithmic. As a result, there is growing use of treatment CDSSs that range from simple information resources, to ‘intelligent’ algorithms that suggest patient-specific evidence-based treatment recommendations. Antimicrobial Resistance Utilisation and Surveillance Control (ARUSC) is an example of an ‘intelligent’ antibiotic CDSS that is fully integrated with the electronic health record. In a recent prospective cohort study in Singapore, use of ARUSC halved mortality rates in patients who were initially started on empiric antibiotics. Similarly, Watson is currently making useful patient-specific treatment suggestions to leading oncologists. Clearly, when making treatment decisions, humans and machines combined are superior to humans alone.

Where does this leave the doctor?

As these systems become more intelligent, diagnosis and routine treatment decisions could, in principle, be performed independently by AI. As a result, the human clinician would only need to perform tasks that are beyond the capability of AI, such as communicating with patients, performing procedures, or making the final treatment decision in combination with the patient. Therefore, the clinician does not necessarily need to be a doctor. The cognitive tasks, which require many years of medical school training and decades of clinical experience, would no longer be the role of the doctor. This would be more apparent in the hospital setting, where there is a greater emphasis on the diagnostic process—as opposed to primary care—where the relationship between doctor and patient is often more important.

However, in both community and hospital settings, health professionals requiring less intensive training than doctors, such as clinical nurse specialists, could be trained to ‘fill the gaps’ where AI remain less capable—for instance, in history-taking.
physical examination or basic procedures. Indeed, it has been shown that with appropriate training, nurse practitioners are comparable to physicians when treating patients in primary care.\textsuperscript{17} There may be a role for a small number of doctors to oversee processes, but the current role of a doctor as an expensive problem solver would become largely redundant.

**Conclusion**

Over the coming years, AI will challenge the traditional role of the doctor. Human doctors make errors simply because they are human, with an estimated 400,000 deaths associated with preventable harm in the US per year.\textsuperscript{18} Furthermore, the relentless growth of first world health care demands in an economically-constrained environment necessitates a new solution. Therefore, for a safe, sustainable healthcare system, we need to look beyond human potential towards innovative solutions such as AI. Initially, this will involve using task-specific AI as adjuncts to improve human performance, with the role of the doctor remaining largely unchanged. However, in the longer term, AI should consistently outperform doctors in most cognitive tasks. Humans will still be an important part of healthcare delivery, but in many situations less expensive, fit-for-purpose clinicians will assume this role, leaving the majority of doctors without employment in the role that they were trained to undertake.

**Competing interests:**

Nil

**Acknowledgements:**

We would like to thank CGP Grey for producing his inspirational YouTube video, *Humans Need Not Apply*, available from: https://www.youtube.com/watch?v=7Pq-S557XQU

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Liposuction has long been used to improve the cosmetic appearance of the abdomen. A new approach has been directed at treating stoma appliance adherence problems. Poorly fitting stoma appliances result in excoriation of the skin, leaking around the stoma bag and embarrassment. In patients with poorly fitting appliances due to the contour of the abdominal wall, and in those with retracted stomas, liposuction may provide a low risk, fast, and easy alternative to surgical stoma revision.

Case study

Our patient was a 48-year-old female with an ileal conduit formed in infancy as a result of spina bifida. She had a BMI of 29 (weight: 70kg, height 155cm) and was confined to a wheelchair. She presented with symptoms of daily leaking around the appliance site, frequent stoma bag changes, and embarrassment, causing marked restriction of activities. She had had two previous surgical stoma revisions for symptom control, both of which were preceded by weight gain. The first revision was successful at achieving good appliance adhesion and decreased leaking for 18 years. The most recent revision was performed in 2006 and was effective in symptom control for a further 9 years. In 2015, the patient noted worsening leakage from the urostomy and was seen in a general surgery clinic. A variety of convex urostomy pouches and accessories—such as seals, pastes, collars and belts—were trialled over a long period of time with little success. The patient was reluctant to attempt a third surgical stoma revision. She was referred to the plastic surgery service for consideration of parastomal liposuction.

On examination, there was a bulge of subcutaneous fat at 12 o’clock above the stoma that protruded further when sitting/standing. The stoma spout protruded by 1cm centrally and had areas of retraction peripherally (5 to 8 o’clock).

Liposuction was undertaken with the use of preoperative gentamicin, cefazolin and enoxaparin. 200mls of infiltrate solution (normal saline 1 L, 40mls 0.5% Marcaine, 1mg Adrenalin) was infiltrated into the parastomal area. Using 5 and 4mm liposuction cannulas, approximately 200mls of fat was aspirated from the parastomal area via three ports. Care was taken to prevent damage to the ileostomy itself by using a Hegar uterine dilator to control the position of the stoma through the subcutaneous fat. The patient remained in hospital overnight for observation. A pressure binder was applied for two weeks.

The patient was reviewed in clinic at 3 months, and by phone call at 6 and 9 months. Our patient was very satisfied with the results. The 36-item Short-Form Health survey (SF36) and a 4-point satisfaction scale was administered assessing the patient’s quality of life 1 week prior to, and 1 month after the procedure. This demonstrated improvement in satisfaction, as well as social, emotional and physical domains. At the 3-month post-operative assessment, the stoma spout protruded further and the superior bulge and inferior area of retraction were flattened. The stoma bag achieved better adhesion and the parastomal surface was more even. The patient reported markedly decreased leakage from daily episodes prior to the procedure, to <1 per fortnight post-operatively. She also reduced the use of stoma bags from 14 per week to 2–3 per week, resulting in a weekly cost reduction from $336 to $72. These changes were persistent at 9 months.
Discussion

The appeal of liposuction for parastomal sculpting is that the procedure is quick, can be done under local anaesthetic in day surgery, and it carries fewer risks than other forms of stoma revision. It could provide elderly, or comorbid patients, or those with multiple prior stoma revisions with a safer option to surgical revision. The saving on stoma accessories for our patient amounted to $13,728 per year, making the liposuction a cost-effective option. Another advantage of liposuction is that a significant amount of adipose tissue can be removed. Abdominal adipose deposits provide a number of challenges for stoma formation and function and liposuction can provide both parastomal and wider abdominal fat removal. This can result in a flatter parastomal area, less stretch on a stoma traversing a thick abdominal wall, and symmetry can be achieved on the opposite side of the abdomen. If there is stoma stenosis or herniation, liposuction may not be the preferred option.3

Despite anecdotal evidence that that liposuction has been relatively widely used for treatment of stoma problems, there are only 17 cases described in the English literature.1,4-8 In these cases, the procedure was undertaken to address problems created by parastomal fat deposits: poorly fitting stoma appliances; leakage; excoriation of skin; discomfort; or obstruction of stoma. Success of the procedure was measured by patient satisfaction, frequency of leaking accidents and bag changes, local skin inflammation changes and, in the cases of continent urostomies, the ability to catheterise. In all cases there was improvement in one or all of these domains.

Excess skin folds exacerbate appliance fitting, as the optimal surface for a stoma site is one that is smooth and flat.1 This was a particular challenge with our patient, as her wheelchair-bound posture exacerbated the curvature of the abdominal wall. The patient cases described in the literature all had some degree of truncal obesity. It is likely that non-obese people with similar stoma problems could also benefit from parastomal

Pre-surgery: Frontal view showing superior bulge and inferior retraction

Pre-surgery: Lateral view showing prominent superior bulge and inferior retraction

Post-surgery: Frontal view showing flat parastomal area

Post-surgery: Superior view showing flat superior face
liposuction, provided the primary problem was parastomal fat deposits.

Current literature suggests that this is a low-risk procedure. In the 17 cases described, no complications were reported. Bowel perforation is a well-discussed potential complication. The techniques described to prevent perforation included inserting a probe or digit into the stoma to provide tactile feedback, and continuous palpation of the instrument tip while suctioning.\(^1\) Bacterial seeding is the other major foreseeable complication during this procedure.\(^9\) None of the reported cases developed a wound infection. The methods of infection prevention described included the use of betadine swabs inside the stoma, prepping a large surface, a plastic adhesive drape over the stoma,\(^1\) double-draping with the second drape extending beyond the first, IV intraoperative broad spectrum antibiotics\(^9\) and postoperative oral antibiotic. The conclusion regarding complication rates of this procedure was limited by variable follow-up.

There are obvious limitations on drawing conclusions from such a limited pool of information. Firstly, the data on the long-term success rates of this procedure is limited (follow-up range: 1–51 months). Therefore, it is difficult to comment on how resilient the liposuction treatment is over time. There is also limited information on the degree to which the procedure improved the patient’s function or quality of life; and despite no complications being reported, each case described may have had differing thresholds for what was considered a ‘complication’. There is also likely to have been significant differences in the treatment methods between cases.

**Conclusion**

From the limited cases in the literature, liposuction for problematic stomas appears to be a safe and simple procedure that achieves good results with minimal risk of complications.

**Competing interests:**

Nil

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James Patrick Beaumont Fitzgerald
18 February 1923–16 October 2013
M.B.Ch.B; Ch.M

Beaumont Fitzgerald was born on 18 February 1923, the eldest son of Constance and Gerald Fitzgerald. He was educated initially at John McGlashan College, Dunedin, and later boarded at Christ’s College, Christchurch, from the age of 12. He followed family tradition by entering medical school in Dunedin, graduating B.Med.Sc. in Anatomy in 1947 and M.B.Ch.B. in 1951. He married Anne Fraser in 1948.

House surgeon and registrar in obstetrics and gynaecology appointments at Dunedin Public Hospital followed. He applied for, and was awarded, the New Zealand Obstetrical Society’s Travelling Scholarship. This took him to Melbourne. He regarded this as a crucial point in his career as he was given responsibility for major obstetrical procedures in the delivery suite. Dr Kevin McCall was in charge of anaesthesia, which Beau put to good use later in Scotland. Anne and their daughter Constance joined him for his last few months in Melbourne.

The family travelled by ship to England with Beau as ship’s doctor. While in the Indian Ocean, Beau carried out an appendectomy on the ship’s baker who retained the inflamed organ in preservative. While in Port Said, the baker traded this for a leather wallet.

After arrival in England, Beau gained an appointment as registrar with Dr Dugal Baird in Aberdeen with responsibilities in three hospitals. Professor Baird’s department was one of the leading centres for obstetrics and gynaecology in the UK at that time. Beau gained great experience during the 3 years he spent in Aberdeen. He also developed an interest
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in cervical cytology and the diagnosis of cervical neoplasia. He sat and gained his membership of the Royal College of Obstetricians and Gynaecologists at this time.

In 1955 Beau returned to New Zealand to take up his appointment as assistant to Professor Lawrence Wright, and junior specialist in the Department of Obstetrics and Gynaecology at Dunedin Hospital and the Otago University Medical School. He undertook gynaecological surgery, medical student teaching and certain research activities. This was a 2-year appointment. At the end of that time, he was appointed visiting specialist (part time) and joined his father Gerald Fitzgerald in private specialist practice in Dunedin.

His private practice grew over the following years. He also devoted much time to hospital and Medical Association affairs. These included the chairmanship of both the general medical staff and the New Zealand Obstetrical and Gynaecological Society, and also presidency of the Otago Division of the British Medical Association.

He graduated Ch.M in 1966, became a Fellow of the Royal College of Obstetricians and Gynaecologists in 1968, and clinical reader in the Department of Obstetrics and Gynaecology in 1980.

In 1977, Beau spent a month in Tonga on a New Zealand Government support scheme. He gave a series of lectures on obstetrics and gynaecology, attended outpatient clinics and carried out a number of operations, some of which were under challenging conditions. Anne accompanied him on this trip, and they both enjoyed the experience immensely.

A Dunedin general practitioner, Dr Barry Grimmond, who had had consultant help from Beau on several occasions and knew him well, wrote following his death:

“As a clinician and consultant Beau was absolutely reliable. No matter what time of day or night, he was instantly awake, intelligently receptive to the situation and responsive and helpful with great competence.

“He was forever the good teacher: able to step back and allow those of lesser competence gain valuable experience under his responsible guidance.

“He brought professional excellence and dignity to the Otago O&G Department.

“There has been no doctor for whom I had greater respect than Beau.”

Dr Peter Fitzgerald, Beau's nephew, spoke at his funeral, concluding with, “Beau's professional legacy is here in Otago. It is the many thousands of women and their families who have benefited from his care during the 40 years he practiced in Dunedin.”

Beau's major interests outside medicine included his Waitati home, gardening, fresh and sea water fishing, occasional trips with his friend Sir Tim Wallis, crayfish gathering on the West Coast and above all, his family. He died on 16 October 2013. His wife Anne died in 2014. They are survived by their children—Constance, Catherine, Gerald and John.

Author information:
Norman Fitzgerald, retired medical practitioner and pathologist, Wanaka

URL:
Weight loss and health status 3 years after bariatric surgery in adolescents

Severe obesity in childhood may lead to serious health hazards. Bariatric surgery is increasingly considered for treatment of adolescents with severe obesity. This report concerns a prospective study of the benefits and possible adverse effects of such treatments.

Over 200 adolescents were enrolled. One hundred and sixty-one had gastric bypass surgery and 67 had sleeve gastrectomy. At 3-year follow-up, the mean weight of all patients had decreased by 27%. Remission of pre-diabetes occurred in 76% of those with this condition, and remission of type 2 diabetes occurred in 95% of those suffering from type 2 diabetes. There were similar benefits seen in those with hypertension, abnormal renal function and dyslipidaemia.

Risks associated with surgery include micronutrient deficiencies and the need for abdominal procedures. Iron and vitamin B12 deficiency were noted. Vitamin D levels were found to be low in 42% of the subjects. Over the 3 years, 14% required further abdominal surgery and 15% required upper gastro-intestinal endoscopy.


Maternal use of oral contraceptives and risk of birth defects

Is oral contraceptive use around the time of pregnancy onset associated with an increased risk of major birth defects? This proposition is examined in this prospective observational cohort study. Data on oral contraceptive use and major birth defects were collected among 880,694 live births from Danish registries between 1997 and 2011.

The researchers compared the risk of birth defects in those who had never used oral contraceptives with mothers who had used them for longer than 3 months before conception, 3 months before conception, and after pregnancy onset. They found the incidence of major birth defects to be the same in each group—a prevalence of 25 per 1,000 births.

In summary, oral contraceptive exposure just before or during pregnancy does not appear to be associated with an increased risk of major birth defects.

BMJ 2016;352:h6712

Sensitivity and specificity of mammography and adjunctive ultrasonography to screen for breast cancer

Mammography is the only proven method for breast cancer screening that reduces mortality, although it is inaccurate in young women or women with dense breasts.

This report concerns a study involving the use of adjunctive ultrasonography which was conducted in Japan.

Over 7,000 women were randomised to receive mammography or mammography and adjunctive ultrasonography. The researchers found that sensitivity was higher and specificity lower in the subjects with added ultrasonography. More cancers were detected in the patients who had added ultrasonography and they were more frequently at an earlier stage.

The conclusion reached was that adjunctive ultrasonography increases sensitivity and detection rate in early cancers.

Lancet 2016;387:347-48

URL:
A case of tumour of the labium majus

JW Crawshaw
April, 1916

The patient is 48 years of age. Just after the birth of her last child, 8 years ago, she noticed what she describes as a “fleshy wart” growing from the right labium majus. This increased in size very slowly, but was no trouble or inconvenience to her till about 4 years ago it developed a pedicle and became pendulous. It then increased in length more rapidly and caused considerable discomfort in walking and sitting. She volunteered the statement that it increased in size—became fuller, she described it— the week after menstruation ceased. The fullness lasted about a week, after which time the tumour shrank, the skin becoming slacker and more wrinkled.

Before removal, the specimen was 5 inches in total length. The pedicle was ½ inch long and about 3/16 inch in circumference at its widest part. The point of its attachment was about ¼ inch from the anterior end of the labium. In the upright position the tumour hung down half way to the knees.

As regards the structure and frequency of pediculated growths of the labium majus, Herman divides them into lipomata and fibromata. He mentions that the former are rare, and that he has never seen a large one. Howard Kelly, in his book on operative gynaecology, does not distinguish between lipomata and fibromata, simply saying that they are soft or hard in proportion to the relative amount of fatty tissue and fibrous tissue.

Kelly states that it is one of the rarest of gynaecological affections and that he could only find records of 20 cases. The tumours varied greatly in size. He describes one he saw which was practically of the same dimensions as the one I show. The tumour was 3 inches in length, hanging by a slender pedicle 2 inches long, and 3 inches thick, from the middle of the right labium majus. At the other end of the scale was one which hung down to the patient’s knees. Another one weighed 24 lbs. The ages of the patients also varied widely. The youngest patient was 18 years and the oldest was 61 years. The rate of growth in all the cases was slow. One had been growing for seventeen years before the patient had it removed.

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