

# Demographic Characteristics and Perceptions of Supply and Demand of Chiropractic Services in Australia: Results from Stage 1 of the Work Force Study Survey

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**ABSTRACT:** *Objectives:* The aim of this report is to describe the demographic characteristics including the age profile, gender differences, income and perceptions of supply and demand of the chiropractic profession in Australia. This workforce study (WFS) was divided into three components, Australian Chiropractors (Stage 1), their patients (Stage 2), and members of the general public (Stage 3). *Methods:* A web-based, 64-item, cross-sectional survey questionnaire was issued to registered chiropractors (CAA and non-CAA members) throughout Australia in 2010. At the time of the survey there were 3,892 registered chiropractors. Survey invitations were sent to those who were registered chiropractors, and had provided email addresses (n=1,917). *Results: Demographic Characteristics:* There is evidence to suggest that the profession may be becoming increasingly female over time. Income exclusively from chiropractic care included 27.9% who reported an annual pre-tax net income of \$115,000 or less and 32.3% earned more than \$115,000. Of the latter group, 12% indicated that they were earning more than \$215,000. Income was not related to the hours worked per week particularly for males. *Supply and Demand:* When considering their home state and their local region, more chiropractors thought that there was undersupply in their state, but an adequate supply in their local region. A large proportion (40%) of the sample felt that universities in Australia were graduating the correct number of chiropractors per year, and 32% reported that too many were being produced in Australia. Very few reported that the Universities were not graduating enough chiropractors. *Conclusion:* This paper reflects some of the findings from Stage 1 of the three stage Workforce study, showing a profession heading towards a more even gender balance and characterised by a higher than average annual income. Future research should include the impact on supply and demand of the possibility of an increasingly female profession. In addition to this, although there is a perception that there is under-utilisation of chiropractic services in inland, rural and remote areas, the extent of which should be further explored. Information from this study will assist with strategic decision making and planning. A strategic framework for the profession should not only consider the findings from this study but also explore other factors that may have an impact on supply and demand, for example general trends in health and aging from local and national government reports.

INDEX TERMS: (MeSH): HEALTH MANPOWER; HEALTH CARE SURVEYS; HEALTH SERVICES NEEDS AND DEMANDS; CHIROPRACTIC; AUSTRALIA (Other): WORK FORCE STUDY SURVEY.

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## INTRODUCTION

Health care expenditure in Australia is increasing<sup>1</sup> coupled with an increased utilisation and expenditure on complementary health services.<sup>2,3</sup> Despite being a comparatively small profession, chiropractic has become increasingly popular as a choice of occupation over the last few decades. This trend has also been mirrored in other complementary and alternative medicine (CAM) fields such as osteopathy and acupuncture.<sup>2</sup> Chiropractic is considered the best established of the alternative health care professions. Historically, the profession was marginalised for much of the 20<sup>th</sup> century, however is now recognised to have entered the mainstream of health care.<sup>4,5</sup>

Due to the growth of chiropractic as a profession and the increase in complexity of modern health care systems, there is an ongoing need for comprehensive job analysis studies of the profession. Consequently, a number of studies have appeared, not only in the countries in which chiropractic has a long history and developed professional infrastructure, but also those in which the profession is still a relative newcomer among existing health professions.<sup>6-12</sup>

In Australia, a job analysis study at the national level has long been overdue. In 2010, a study commenced that was funded by both the Chiropractic Association of Australia National (CAAN) and Macquarie University, to address this important subject. The main aims and the research plan for this project have been presented previously in this journal.<sup>13</sup> This Workforce Study (WFS) was divided into three components, reflecting the three crucial social groups from which the research team has drawn its data – *viz* Australian chiropractors (Stage 1), their patients (Stage 2), and members of the general public (Stage 3).

The aim of this introductory report is to describe the demographic characteristics of the chiropractic profession in Australia from Stage 1 of the study. More specifically, this includes an examination of age profile, gender differences, income, and perceptions regarding supply and demand. In this way the cross-sectional analysis can provide data which may assist in the development of comprehensive strategic planning which may support the development of long- and short-term goal-setting relating to chiropractic utilisation and services. This article represents only a small part of the Stage 1 results. The remaining data from Stage 1 will be presented and analysed in future publications.

## METHODS

A novel, 64 item, cross-sectional survey questionnaire was constructed by the research team in consultation with the Chiropractors' Association of Australia National (CAAN) board for issue to registered chiropractors across Australia during the period of July through to the end of August 2010. The survey was formatted for web-based delivery on SurveyMonkey™, the electronic data gathering platform. For access to the survey please refer to <http://chiro.mq.edu.au/Research/projects/>.

Ethics approval for this study was granted by the Macquarie University human ethics committee on May 9<sup>th</sup>, 2010 (Approval Number: 5201000403).

To be included in the study, participants had to be registered as chiropractors in Australia. An invitation was

issued to registered chiropractors in Australia to access a secure web page which housed the data collection instrument. The accessible population was made up of chiropractors who agreed to receive electronic communications publicised in general, *via* the Chiropractors' Association of Australia National (CAAN) newsletters, or *via* the professional magazine – The Australian Chiropractor.

To obtain a representative sample with 95% confidence level and a margin of error of 4%, 457 respondents were required. Response rate calculations were based on the number of survey questionnaires that were completed and returned during the data capture period divided by the number of potential responses.

Participants were required to read a study information package and to formally consent to participation. Upon consenting to participate in the survey, each participant completed one single online survey. Participation was entirely voluntary and no personally identifiable information was collected. No attempt was made to match responses with individual respondents. There were no incentives offered for participation in the study.

The research tool was designed to capture information on a variety of categories: chiropractor demographics and descriptive data, conditions commonly treated in practice, levels of education and training, patient profiles, as well as perceptions about chiropractic and allied healthcare.

An attempt was made by the researchers to draft questions that were clear, simple and specific to the research aims. Special attention was paid to the length, wording, and order of the questions included in the survey to reduce the impact of non-response or misinterpretation. The questionnaire was piloted in 2004 in a NSW-based study and then modified as necessary in July 2010. The questionnaire was then reviewed by members of the chiropractic faculty, a linguist, anthropologist, educators and social scientists, and the Board of Directors at CAAN. Pilot testing revealed that the survey questionnaire took approximately 15 minutes to complete.

Responses to the survey questionnaire were recorded using a variety of methods: tick-box options, and short answer format. Survey results were included in the analysis only if they had been completed within the data capture period. The data were then compiled and analyzed by members of the research team. The data in this report are based on a subset of the questions from the WFS survey questionnaire.

All data were screened and checked for errors prior to analysis. Results are presented as counts with percents in parentheses for categorical data and as means for continuous data. Fisher's exact tests were used to determine the significance of associations for categorical variables of interest and two-sample t-tests were used to examine evidence of differences between groups. Tests were deemed significant if the p-value was less than 0.05. The statistical software package IBM SPSS Statistics v19 was used for the analysis.

## RESULTS

At the time of the survey there were 3892 registered chiropractors. Survey invitations were sent to those who were

Table 1

Institution	Respondent Age Groups, Gender and Institution of Graduation								
	Males				Total (%)	Females			Total (%)
	Age Group (years, %)			Age Group (years, %)					
<30	30-50	>50		<30	30-50	>50			
Macquarie	11 (30.6)	56 (36.1)	3 (4.2)	70 (26.7)	22 (57.9)	29 (33.3)	1 (14.3)	52 (39.4)	
Murdoch	7 (19.4)	4 (2.6)	2 (2.8)	13 (5.0)	10 (26.3)	2 (2.3)	0 (0.0)	12 (9.1)	
RMIT	13 (36.1)	74 (47.7)	21 (29.6)	108 (41.2)	5 (13.2)	44 (50.6)	4 (57.1)	53 (40.2)	
SCC	0 (0.0)	2 (1.3)	17 (23.9)	19 (7.3)	0 (0.0)	4 (4.6)	2 (28.6)	6 (4.5)	
Other	5 (13.9)	19 (12.3)	28 (39.4)	52 (19.8)	1 (2.6)	8 (9.2)	0 (0.0)	9 (6.8)	
<b>Total</b>	<b>36 (13.7)</b>	<b>155 (59.2)</b>	<b>71 (27.1)</b>	<b>262 (100)</b>	<b>38 (28.8)</b>	<b>87 (65.9)</b>	<b>7 (5.3)</b>	<b>132 (100)</b>	

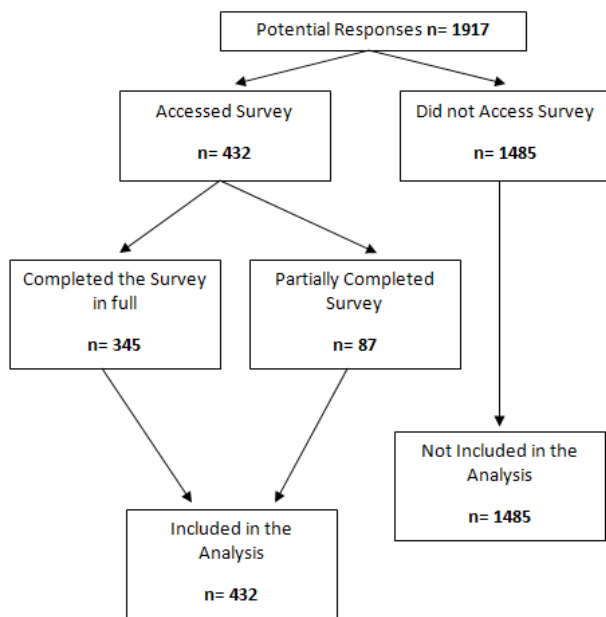


Figure 1: Participant Flow Diagram

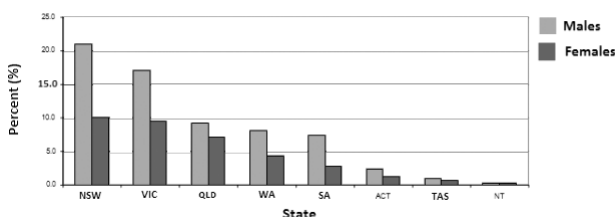


Figure 2: Respondents Origin by State

registered chiropractors (CAA and non-CAA members), and had provided email addresses (n=1917) to the registration board. Of the available population, 432 chiropractors accessed the survey. This figure is close to that required for a representative sample, and as such the expectation is that the responses may be generalisable to the broader population of chiropractors. Using these figures, the response rate to the electronic survey was 23%. It should be noted that partially completed questionnaires were also included in the response rate calculations.

Of the 432 who accessed the survey, 345 completed the entire questionnaire with no missed questions (Figure 1). There was no apparent pattern or measureable effect created by the missed questions from the 87 incomplete surveys. Missed questions occurred from a variety of topics for example 'gender' and 'language spoken at home'. As to the geographic distribution of respondents, participants from every state and territory in Australia responded at a rate very close to that expected for a representative sample.

**Respondent Demographics**

As expected, the majority of respondents stated that their country of birth was Australia (79%), followed by 14 (3.6%) born in New Zealand and 12 (3.1%) in Canada. The remaining respondents had various countries of birth. Most (97%) respondents reported that they spoke English at home. Nine other languages were reported by the cohort.

Figure 2 displays the geographic distribution of the respondents according to state. Every state and territory in Australia was represented in the survey. Most respondents were from NSW and Victoria, statistics consistent with the current Australian census for chiropractors.<sup>14</sup> The graph shows that only 1% of respondents were from the Northern Territory, while approximately 2% stated they were from Tasmania. Ten percent of respondents did not specify the state in which they worked.

Of the 396 respondents that answered the gender question, a significantly higher proportion were male (66%, p-value<0.001), suggesting that the profession continues to be male dominated. All states in Australia had a greater percentage of males in chiropractic practice (Figure 2).

Table 2

Highest Level of Qualification of Respondents		
Qualification	Frequency	Relative Frequency (%)
Bachelors Degree	161	37.3
Masters	145	33.6
DC	51	11.8
Graduate Diploma	25	5.8
PhD	3	0.7
Missing	47	10.9
Total	432	100.0

DC= Doctor of Chiropractic, PhD= Doctorate of Philosophy

Table 3

Annual Pre-Tax Per Annum Income Estimates of Respondents		
Pre-Tax Income Estimate	Frequency	Relative Frequency (%)
<\$40,000 p.a.	27	6.3
\$40,000 - \$65,000 p.a.	56	13.0
\$65,001 - \$90,000 p.a.	40	9.3
\$90,001 - \$115,000 p.a.	37	8.6
\$115,001 - \$140,000 p.a.	39	9.0
\$140,001 - \$165,000 p.a.	23	5.3
\$165,001 - \$190,000 p.a.	17	3.9
\$190,001 - \$215,000 p.a.	9	2.1
>\$215,000 p.a.	52	12.0
Preferred not to say	29	6.7
Missing	103	23.8
Total	432	100.0

p.a. = per annum

Table 4

Perception of Supply of Chiropractors in Local Suburb/Town		
Variable	Frequency	Relative Frequency (%)
Under supply in locality	74	17.1
Over supply in locality	76	17.6
Adequate supply in locality	218	50.4
Don't know	12	2.8
Missing	52	12.0
Total	432	100.0

Table 1 displays the distribution of age, gender and institution graduated from of respondents. It can be seen that the 30-50 year age group was the most well represented group in the study regardless of gender.

Table 1 also presents the chiropractic school/college/institution attended by the respondents. Most respondents had graduated from either Macquarie University (31.0%) or from RMIT (40.9%) (Note that the values for RMIT also include those for its older namesake Preston/Philip Institute of Technology). Overall a total of 25 chiropractic institutions were represented in the sample with the majority (88%)

of graduates reporting that they gained their qualifications from Australia, the United States, the United Kingdom and Canada.

There were more males from RMIT and the Sydney College of Chiropractic (SCC). There were more female respondents in the 'Under 30 year age group' and the '30-50 year age group' from Macquarie University and Murdoch University. Table 1 shows that 20% of male respondents and 6.8% percent of female respondents gained their chiropractic qualification from other institutions. When considering the age profile of these graduates it is apparent that they are far more strongly represented in the oldest category indicating that there is a trend away from attaining primary chiropractic qualifications from overseas towards gaining a local degree. This implies that in recent years there has been only a modest influx of foreign-trained chiropractors.

Table 2 shows the highest qualification level attained by respondents. Data on the educational background of the surveyed chiropractors shows an interesting but not unexpected result. For the surveyed group, approximately 71% of the chiropractors reported having bachelors or masters degrees in chiropractic, 12% held Doctor of Chiropractic (DC) qualifications, 6% held a graduate diploma, only 1% of the cohort reported holding a PhD. Two of the three chiropractors with a PhD qualification were over 50 years of age.

### Income

Table 3 shows the annual pre-tax income of the respondents in the sample. While 7% of the respondents opted not to state their income, 41% reported an annual pre-tax net income of more than \$90,000. Of the latter group, 12% indicated that they were earning more than \$215,000, 6% estimated earning less than \$40,000 per annum. What is important to note is that these figures represent income derived exclusively from chiropractic care. Income derived from other business activities has been excluded.

Respondents who did not state their income did report that they saw in the order of 100 patients per week, placing them at an estimated income in excess of \$100,000 per annum. Most of the highest income earners came from NSW, although a higher proportion of those living in Queensland earned higher incomes (>\$115,000, not presented).

Not surprisingly, there was a positive relationship between income and patient numbers. Interestingly, income was not related to the number of hours worked per week, particularly in the male cohort. In the higher income bracket (>\$115,000) for females, there was a closer relationship between the number of hours worked and income. On average, males worked about 4 hours longer per week than females (p-value=0.002), and on average consulted with 40 more patients (p-value<0.001).

### Supply and Demand

One of the aims of the WFS was to analyse the chiropractic profession in order to gain information which may assist in the development of a strategic plan that would aid in the handling of issues relating to supply and demand of chiropractic services.



**Table 5**  
Perceptions of Supply of Chiropractors in their State

Variable	Frequency	Relative Frequency (%)
Under supply in State	65	15.0
Over supply in State	136	31.5
Adequate supply in State	107	24.8
Don't know	84	19.4
Missing	40	9.3
Total	432	100.0

**Table 6**  
Perceptions of Current Graduation Rates from Australian Institutions

Variable	Frequency	Relative Frequency (%)
Too Many	138	31.9
Too Few	49	11.3
Correct Output	174	40.3
Missing	71	16.4
Total	432	100.0

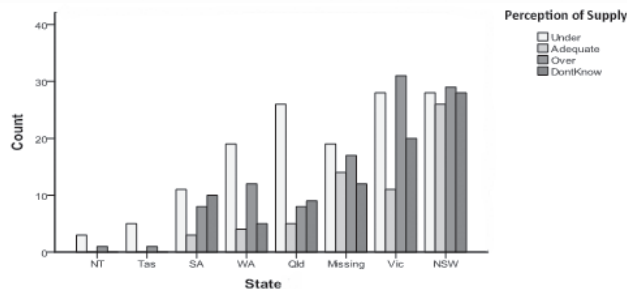


Figure 3: Perceptions of Supply in Home State by State

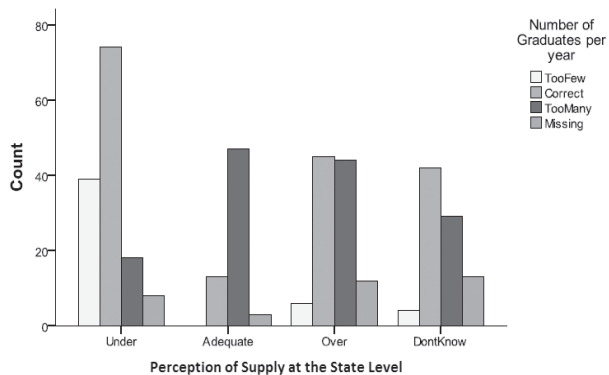


Figure 4: Adequacy of Graduation Rate by State Supply Perceptions

**Adequacy of Supply at the Local Level**

Table 4 outlines the data for the whole cohort on perceptions of supply on a local level. Half of the respondents reported that they perceived there to be an adequate supply of chiropractors in their local area. The remaining responses

were evenly split between the view that there was an undersupply or oversupply (17% and 18% respectively).

When responses to this question were examined at the state level, it was apparent that the majority of respondents in each state felt that there was adequate supply in their suburb or town. However, the respondents from the Northern Territory and Tasmania were more likely to say there was an undersupply of chiropractors locally where they work (not presented).

**Adequacy of Supply at the State Level**

Table 5 presents the results of the respondent's perceptions of supply in their own state as opposed to their locality. The responses to this particular question were quite mixed as demonstrated in Table 5.

Figure 3 breaks the data down into state by state responses and therefore provides useful information for planning and review purposes. The bulk of respondents from South Australia, Western Australia, Queensland, Tasmania and the Northern Territory perceived an undersupply in their state. Respondents from New South Wales and Victoria displayed more mixed responses.

In summary, when considering their home state and their local region, more chiropractors thought that there was undersupply in their state (Figure 3), but an adequate supply in their local region (Table 5). Moreover, Figure 3 highlights different perceptions of adequacy from state to state.

**Perception of Current Graduation Rates**

Respondents were questioned regarding their perceptions of the numbers of graduates being produced each year by the Australian educational institutions. The results are presented in Table 6, and Figure 4. A large proportion (40%) of the sample felt that universities in Australia were graduating the correct number of chiropractors per year, while a further 32% reported that too many were being produced in Australia. Examining, those who thought that producing 200 new chiropractors per year was too many, most of these respondents felt that fewer than 200 graduates would be preferable.

Figure 4 examines respondents perceptions regarding the rate of production of chiropractors according to whether they believe that there is an undersupply or oversupply of chiropractors in their state or territory. For instance, the left hand columns of Figure 4 show the responses of those who believe that there is an undersupply of chiropractors in their state. It shows that most of these respondents believe that the schools are graduating the correct number of chiropractors. This implies that while those individuals believe that the production of chiropractors at the current rate is correct perhaps the graduates are then not practicing in areas in which they are needed. In contrast, respondents who believe that there is an oversupply of chiropractors in their state (*i.e.* the third group of columns from the left), are equally divided as to whether there are too many or the correct number of graduates being produced by the schools. In fact, very few within that group believed that the schools were producing too few graduates.

Furthermore, most of the respondents who said that there was an adequate number of chiropractors in their state felt that the current rate of production was too high. This might be interpreted to mean that current levels are adequate but continued production of new graduates will lead to oversupply in their state. Amongst those who stated that they did not know if their state had too many or too few chiropractors, most thought that the schools were producing an adequate number of graduates.

## DISCUSSION

Complementary and alternative medicine (CAM) therapists such as chiropractors, naturopaths and acupuncturists are relatively small occupational groups but have become an increasingly popular occupation choice over the last few decades.<sup>2</sup> Reasons for this are varied including an increased interest in alternate lifestyles,<sup>2</sup> and a greater exposure to eastern philosophy *via* China through an increase in immigration and trade.<sup>15</sup> At the end of June 2010 there were 11,440 persons engaged in the chiropractic and osteopathic service industry.<sup>14</sup> According to the census, there were 8,600 people employed as complementary health therapists in 2006 which was almost 80% higher than the number in 1996. The leading occupations were naturopaths (2,980) and chiropractors (2,490), demonstrating a growth of 56% and 45% respectively from 1996. Overall, the Australian population increased by 12% and the total number of health professionals rose by 31%.<sup>2</sup>

Xue *et al*<sup>3</sup> provided estimates, for the Australian population, of expenditure on visits to CAM therapists to be around AUD \$1.73 billion between 04-05. The total estimated Australian expenditure on CAM treatments and related products was AUD \$4.13 billion for that period. The national expenditure on CAM accounts for approximately half the total expenditure on non-subsidised health care products. Furthermore, Xue and colleagues<sup>3</sup> estimate that Australians visit CAM practitioners almost as often as they visit medical practitioners.

The organized profession, armed with such data can better target its strategic planning in promoting the profession. Entreaties to political groups could be better informed, basing its arguments on evidence rather than hopes and aspirations. On the other hand, the profession is not static and, given the rapidly changing internal and external environment, it is likely that the trends occurring within the profession will change in the future. For example, factors that may directly or indirectly impact on the profession for future planning include legislation and policy, research, integration or collaboration of chiropractic into mainstream health, and advancing technology. A scan of the internal and external environment as well as liaison with key stakeholders is necessary to assist with future planning for the chiropractic profession.

### Demographic Characteristics

Strategic planning and goal setting for chiropractic and health care in general, should factor in population trends in general and the impact on the health care system by the growing ageing population. Seventy percent (70%) of respondents in this study live and work in metropolitan areas, while the remaining 30% are living and working in rural and remote areas. This is similar with the distribution

pattern of the general population where growth continues to be most prominent in inner-city areas, outer suburbs, urban infill areas and along the coast.<sup>16</sup> Areas that have seen a decline in population include inland rural areas that have been affected by drought in the last few years.<sup>16</sup> This matches the distribution of healthcare services in Australia with approximately 75% of healthcare services being located in metropolitan areas.<sup>14</sup> Therefore, it remains apparent that with regard to health care, the inland, rural and remote areas continue to be underserved. Long-term planning should include a framework that allows a greater provision in health care services, including chiropractic care. Chiropractic education providers would also benefit students by orientating aspects of the curriculum towards rural health services.

Most respondents to this survey were from NSW and Victoria (Figure 2). This is consistent with the current Australian census for chiropractors.<sup>14</sup> The preponderance of chiropractor numbers in NSW and Victoria reflects the fact that there have been chiropractic schools in those two states for over 50 years. It is likely that a higher percentage of graduates establish their practices near their school of graduation. Other states have only had short term, sporadic chiropractic training offerings.

### Gender Implications

A larger proportion of female respondents were in the under 30 year age group and the 30-50 year age groups compared to males. This suggests that when gender and state distribution are viewed in light of practitioner age, there may be an evolution of the profession towards an increasingly female bias over time.

There is a consistent historical trend that women predominate or account for almost half of those who work in complementary therapies such as naturopaths (79%), homeopaths (76%), acupuncturists and osteopaths (49%), while men predominate in traditional Chinese medicine and chiropractic.<sup>2</sup> It seems apparent that the results of this study are consistent with the current social trends, however it is clear that the proportion of women in Australia studying chiropractic and entering the chiropractic workforce is steadily increasing. A similar trend has been observed in the US from the periods 1991-2009.<sup>17</sup> There is a greater tendency for women to enter into part-time work as this is a means of combining the responsibilities of young children with paid employment.<sup>18</sup> Having said this, it is noteworthy that results from the Australian Family Project show that part-time work has also become increasingly important for single and married women without young children. These factors affect the supply of chiropractic services so that, although the number of registered female chiropractors may be increasing, the supply of services will not be increasing at the same rate. Interestingly, male chiropractors work an average of 4 hours per week longer than females and consult with more patients per week. The chiropractic profession in Australia is predominantly male (66%) at this point in time. These findings are consistent with other job analysis studies. In Switzerland, male practitioners make up 71% of the chiropractic workforce<sup>10</sup> and in Finland this figure was 80%.<sup>19</sup> In 2009, males made up approximately 78% of the total chiropractors in the United States.<sup>17</sup> Interestingly, the UK chiropractic workforce seems to be somewhat more

balanced with respect to gender with males making up just over half (55%) of the pool of practitioners.<sup>9</sup> A study by Alliet *et al*<sup>20</sup> highlighted that of the small number of chiropractors in Belgium, the majority (55%) were female.

**Income**

Chiropractic can be considered an attractive career in terms of flexibility, hours worked and income. This information, combined with data on health service distribution, should be reported to high school careers offices and government employment offices. According to the Australian Bureau of Statistics (ABS), the average income earned per practitioner in 2009-2010, for the chiropractic and osteopathic professions was \$108,500.<sup>14</sup> This is in the general vicinity of the figure found in this study of \$115,000 for the chiropractic profession only. The average weekly income for a chiropractor is well above the average weekly income for a full-time adult.<sup>21</sup>

**Supply and Demand**

Qualitative and quantitative information relating to supply and demand enables strategic decision making and planning. It can assist chiropractic training institutions, the Chiropractors' Association of Australia, the Chiropractors Registration Board of Australia and other stakeholders in making informed decisions about the supply and behaviour of chiropractors in the country. Questions surrounding whether or not there are too many chiropractors in Australia remain difficult to answer.

Table 7 shows a comparison of chiropractor and medical doctor numbers in the US, Canada, Great Britain and Australia.<sup>22</sup> It is apparent that chiropractic services are underutilized by the general population compared to the medical profession. This is a sound premise for developing strategies that would build the awareness of chiropractic services to the general public.

It is reported that the demographic distribution of the general population in Australia reflects a majority population (including migrants) living in NSW, Victoria and Queensland.<sup>23</sup> It is noteworthy that Western Australia, in particular the city of Perth, continues to have the fastest population growth rate in 2010-11.<sup>23</sup> Tasmania and South Australia have the highest proportion (15.6%) of people aged 65 years and over. However, the largest increase in people over 65 years of age is occurring in NSW, Victoria and Queensland.<sup>23,24</sup>

The examination of the supply and demand status for a profession is a difficult task. There are several reasons for this. Supply and demand are not absolutes. The production of new chiropractors by Australian educational institutions is, by far, the largest source of supply for the chiropractic profession however supply varies across a number of vectors. The issue of adequacy of supply was investigated from a number of perspectives. In this study chiropractors were asked about their perceptions of adequacy of supply in their town and in their state. They were asked if they thought that the Australian schools were producing enough chiropractors or too many. By using the individual experiences of the cohort of respondents, a grass-roots impression could be gained concerning the adequacy of supply of chiropractors

Table 7

Country	Doctor Per Population Ratios	
	Chiropractors per Unit of Population	Medical Doctors per Unit of Population
United States	2.4	390
Canada	2.1	390
Great Britain	0.01	440
Australia	2.0	400

Unit = 10,000 members of the population

in Australia. In most states across Australia, respondents gave quite a differing view about supply in their own state as opposed to their own locality or town. More chiropractors, particularly in South Australia, Western Australia and Queensland thought that there was undersupply in their state but adequate or oversupply in their local region. In the Northern Territory and Tasmania respondents felt there was an undersupply in both their locality and state. In NSW and Victoria there was a clear indication that there was adequate or oversupply in their locality (NSW more so than Victoria) however, the results according to their state were more equal with regard to under and oversupply. Respondents who did not specify their state of origin, and have been coded as 'missing' for this question, held a view similar to NSW and Victoria with regard to their perception of whether there is an oversupply or undersupply in their locality or town as opposed to state. These perceptual differences may be attributed to the premise that most of the respondents in this study were from metropolitan areas as opposed to rural and remote areas. These perceptions may be based on the concept that rural and remote areas are underserved. While the distribution of health services in these areas is less than that of the metropolitan areas, further investigation is required to determine if there is in fact a shortage of chiropractors in rural and remote areas.

The evidence provided by this survey offers some tantalizing insights into what chiropractors believe on this issue as well as some more objective pointers to help unravel the issue. Attitudes are shaped by personal experience as well as political imperatives. Neither of these forces rely on objective evidence. Personal experiences may be skewed. The data set revealed that it was common for chiropractors with the same postcode to have opposing beliefs about the adequacy of supply in their town. These beliefs are a mixture of cognition (working the problem out) and emotional overlay. Additionally, the results of surveys on patients and members of the general public on these issues should be triangulated with the data presented here and this would be likely to yield a more rounded perspective.

As mentioned, a political imperative also shapes attitudes. A number of chiropractors in open-ended question responses stated that it was important for schools to maintain higher graduation numbers for the purpose of getting the chiropractic message "out there." Certainly the number of advocates of chiropractic and the number of suppliers of chiropractic services is important considering that market 'competitors' outnumber chiropractors.<sup>14</sup> Physiotherapy schools produce a far greater number of graduates each year – not surprisingly with 18 Australian universities programs involved.<sup>25</sup>



Chiropractic has three schools established and one 'on the way.' But this view of competition would be advocated by politicians and economists. The vast majority of chiropractors in the survey did not believe that either physiotherapists or osteopaths were significant competitors for their services in the marketplace. This view was held irrespective of the chiropractor's income.

The training institutions for chiropractors are dominated by 'supply side thinking' without particular reference to demand. That is, universities will offer places in their chiropractic programs as long as there is a plentiful call for such places and as long as it is in the universities' interest to fill them. This boosts supply of chiropractors without reference to the demand for chiropractic services. It is important that the educational system responds to the workforce needs as questions arise as to whether the supply of chiropractors in Australia meets either the needs or the demand of the general public for this service. Mior and Laporte<sup>26</sup> have reported a long-run over supply scenario in Canada and have suggested that educational institutions should make efforts to understand the factors influencing supply, both for graduates and the existing profession.

At the time the survey was constructed the output from the schools was in the order of 200 graduates per year. At that rate, there was perhaps an understandable response that for those respondents who thought there was an undersupply also reported that they believed that the production of chiropractors at the current rate, or perhaps at an elevated rate, is desirable. However in contrast to this, respondents who believe that there is an oversupply of chiropractors in their state are equally divided as to whether there are too many or the correct number of graduates being produced by the schools. This can be interpreted to mean (at least in part) that current levels are adequate but continued production of new graduates will lead to oversupply in their state. With the advent of a new school in Queensland in concert with enrolment growth in the existing schools, may contribute to an oversupply in the long term. Although supply cannot be considered in isolation from demand, consideration should be given to the notion that any increase in the supply of chiropractors in the Australian market place will stimulate increased demand to more than compensate. This phenomenon is called 'supplier induced demand.'<sup>27</sup>

## CONCLUSIONS

The results of the first part of WFS presented in this paper show some noteworthy patterns. Looking at the demographic aspects, it appears that there is an increase in the number of female practitioners in the traditionally male dominated Australian chiropractic profession. The higher number of female chiropractors, particularly among the younger cohorts, suggests that the gender ratio among practitioners might be changing. According to the Australian workforce statistics there are notable differences in work preferences between male and female members of the workforce. This implies that presently, and in the near future, the structure and *modus operandi* of a typical chiropractic practice might endure some changes.

Our study concurs with the current Australian statistics data, suggesting that the average income of the local chiropractors is just above AUD \$100,000 and significantly above the average Australian earnings. This, coupled with the relatively low number of working hours of the surveyed chiropractors suggests that the profession allows for a comfortable and rewarding lifestyle. This, it might be hypothesized, is one of the reasons for the increased interest in chiropractic profession and decision to introduce a new, fourth training facility, based in a government funded university.

A large majority of surveyed chiropractors obtained their qualifications from the Australian tertiary institutions. This suggests that further support from the professional bodies to the academic departments, both financial (scholarships, grants and funding for research in chiropractic, *etc.*) and academic (invitation to academics to get involved in the work of professional bodies, workshops, activities in continuing professional development, *etc.*), should be encouraged. This is particularly the case in the field of research and postgraduate studies. It has been recently estimated that "much of the positive evolution of chiropractic can be ascribed to a quarter century-long research effort."<sup>5</sup> This survey reveals that only a small proportion of chiropractors hold PhDs and worryingly, these individuals belong to the older cohort of respondents. This study found a trend toward gaining chiropractic qualification locally rather than overseas.

There seem to be different attitudes among respondents concerning the issue of the workforce supply and demand. This is not surprising bearing in mind the multi-causality of attitude formation, particularly about complex issues such as supply and demand. It could be argued, however, that there is a general feeling that there is an undersupply of chiropractors in the Northern Territory, Tasmania and, although findings here are more ambivalent, in rural areas in general. These factors should be considered by professional and educational bodies when advising students and new graduates and planning curricula.

Overall, the first selection of results from the WFS seems to suggest that chiropractic in Australia is a healthy and growing profession. It is hoped that more data from all three stages of WFS, which will appear in print shortly, will shed more light on the place of chiropractic within the Australian health system.

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