Biostatistics Collaboration of Australia: survey of current and potential employers of biostatisticians

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Contents

Executive summary

This report presents the findings of an online survey conducted on behalf of the Biostatistics Collaboration of Australia (BCA) to assess the employment environment for biostatisticians in Australia.

The survey was distributed to 250 individuals on a mailing list compiled by the BCA, and advertised on the 'anzstat' e-mail list. A total of 102 responses were received. The university sector was the most highly represented among the respondents (41%), followed by those from Australian and State government agencies (22%) and not-for-profit research organisations (19%).

The majority of all respondents (90%) said it was 'very important' for their organisation to have staff with specialist biostatistics training, and more than three-quarters of respondents were more likely to employ staff with biostatistics expertise than to engage consultants.

Over the past 12 months, respondents had tried to fill 180 positions requiring specialist biostatistical qualifications, the majority of which were full-time (86%). Over the same period, 124 positions were successfully filled. The greatest proportions of the filled positions were at PhD level (44%), followed by master's (27%) and honours (24%) degree levels. Of the positions filled at PhD level, the majority were in the university sector (39%) or in government agencies (37%).

Over the next 12 months, respondents were expecting to recruit for 157 positions requiring specialist biostatistical qualifications; with 40% of these positions anticipated to be at PhD level. A significant proportion of the total number of positions to be recruited in the next 12 months were expected to be in the university sector (38%).

Just over three quarters of the respondents (78%) indicated that the supply of good applicants for positions that require specialist biostatistical training remained inadequate, highlighting an ongoing need for BCA training programs. Overall feedback was very positive and reflected widespread and enthusiastic support for the BCA.

1.   Introduction

1.1   Background and objectives

The Biostatistics Collaboration of Australia (BCA) is a consortium of eight universities that pool expertise to offer flexible specialist distance-learning programs in biostatistics at master's degree, graduate diploma and graduate certificate levels. The eight participating universities are the Universities of Queensland, Newcastle, Sydney, Melbourne and Adelaide, Macquarie University, the Australian National University and Monash University. The Board of the BCA comprises representatives from universities, government and the pharmaceutical industry. Students undertaking BCA programs select one university for their primary enrolment but may select courses from any of the other participating universities. The coordinating unit of the BCA is located on the campus of the University of Sydney.

The specialist BCA programs were established to fill a perceived gap between the (then) existing biostatistics units in public health and epidemiology programs on the one hand and mathematical statistics programs on the other. The former are mostly designed to train users of biostatistical research rather than biostatisticians, while the latter are mostly designed to train professional statisticians rather than biostatisticians with the requisite expertise for health and medical research.

Although biostatisticians are essential members of health and medical research teams, suitably qualified biostatisticians are perceived to be in short supply in Australia. In order to estimate demand for biostatisticians, the BCA commissioned the Sydney Health Projects Group (SHPG) to undertake a survey of Australian employers and potential employers of biostatisticians. The specific objective of the survey was to estimate met and unmet demand for specialist biostatisticians in Australia over the past year (2008) and over the next 12 months (2009), with reference to current and anticipated employment opportunities.

The project was managed and conducted by the SHPG. The BCA defined the content of the survey and provided a list of organisations and individuals to be surveyed. The Information Technology Unit in the Sydney Medical School (University of Sydney) provided the technological means for on-line data collection.

1.2   Survey sample

For the purposes of the survey, the BCA compiled a list of known current and/or potential employers of biostatisticians in Australia (n=250). E-mails inviting participation were addressed to potential respondents who were considered likely to have responsibility for the recruitment of biostatisticians on behalf of the organisations on the list. Recipients of the survey were based in all Australian States and Territories. Almost half were based in NSW, approximately one-fifth were based in Victoria, and approximately one-eighth were based in Queensland. Just over half of the recipients were based in universities and research organisations and one-fifth in government agencies (Table 1).

Table 1:   Organisational base of survey recipients*

Type of organisation	Frequency	Percent
Australian Government agency	15	6.0
State Government agency	36	14.4
University	92	36.8
Not-for-profit research organisation	38	15.2
Hospital or other healthcare provider	22	8.8
Private sector	32	12.8
Other	15	6.0
Total	**250**	**100.0**

* Note: Our classification of survey recipients may not correspond exactly to the self-classification by survey respondents (Table Q1, Section 2 below).

The survey was also advertised on a mailing list of individuals interested in statistics, known as 'anzstat' (anzstat@lists.uq.edu.au).

The BCA e-mail invited recipients to forward the survey if they believed that others in their organisations would more appropriately complete it. Electronic tokens were used to ensure that only one response was received per person; from some organisations, more than one individual responded.

1.3   Survey questionnaire

The survey was distributed with an introductory letter (Appendix 1) from the BCA Executive Officer (Ms Erica Jobling) on behalf of the BCA Steering Committee. The letter explained the purpose of the survey and provided an electronic link to a website where respondents were able to complete the questions online (Appendix 2). The content and structure of the survey questions were developed by the BCA Survey Panel (also listed in Appendix 1).

The questionnaire collected information about respondents' organisational affiliation; the relative importance to their organisation to have staff with specialist training in biostatistics; the type of recruitment conducted within their organisation of statisticians with specialist biostatistical qualifications; perceptions about the availability of specialist biostatisticians; their past experience of recruitment of biostatisticians, and anticipated recruitment of biostatisticians.

The first ten of the eleven questions were closed format and required participants to tick boxes or provide a one or two word response. The final question was open-ended and invited feedback about the BCA program and comments on professional training in biostatistics more generally.

1.4   Survey distribution

The survey was distributed by email on 19 February 2009. A follow up email was sent as a reminder on 4 March 2009 to those who had not responded by that date. All remaining non-respondents (for whom contact details were available) were further followed up by telephone on 9 & 10 March 2009 by the SHPG project coordinator. The survey went offline on 12 March 2009.

The University of Sydney Faculty of Medicine's IT Unit provided the necessary IT support to distribute and collate the survey. The survey was conducted using 'LimeSurvey'; an open source web application designed for developing, publishing and collecting responses to online & offline surveys.

2.   The survey: response and findings

The survey was completed by a total of 102 respondents, of whom 6 were from the 'anzstat' mailing list, therefore 38% of recipients of the original e-mail responded. This is a relatively good response rate for an e-mailed survey with minimal follow-up, and indicates significant interest in and engagement with the BCA by the individuals and organisations on the BCA contact list.

The responses to each of the survey questions are summarised below, together with the text of the questions and the response sets. Question 2 is not shown below – it was included only for survey management reasons.

Q1   What type of organisation do you work for? (choose one or more of the following)
- Australian Government agency   – Hospital or other health provider
- State Government agency   – Private industry
- University   – Other
- Not-for-profit research organisation

Among the 102 respondents, the university sector was the most highly represented (41%), followed by 22% from Australian and State/Territory Government agencies and 19% from not-for-profit research organisations. Eight percent of responses were from the private sector, seven percent were from hospitals or other health providers. One response came from a national organization ('other'). Of the four responses from Australian Government Agencies, three were from one research agency.   (Table Q1)

Table Q1:   Organisational base of respondents

Type of organisation	Frequency	Percent
Australian Government agency	4	3.9
State Government agency	18	17.6
University	42	41.2
Not-for-profit research organisation	19	18.6
Hospital or other healthcare provider	7	6.9
Private sector	8	7.8
Other	1	1.0
More than one institution	3	2.9
Total	**102**	**100.0**

Q3   How important is it to your organisation to have staff with specialist training in biostatistics? (please choose)
- Not important at all   – Very important
- Somewhat important   – No opinion

The great majority of respondents (90%) said it was 'very important' for their organisations to have staff with specialist training, and all of the remainder thought it was 'somewhat important'. (Table Q3.1)

The lowest proportion of respondents selecting 'very important' (79%) were in non-for-profit research organisations, followed by the hospital sector (86%). (Table Q3.2)

Table Q3.1: Importance of having staff with specialist training in biostatistics

Level of importance	Frequency	Percent
Somewhat important	10	9.8
Very important	92	90.2
Total	**102**	**100.0**

Table Q3.2: Importance of having staff with specialist training in biostatistics

Type of organisation	Level of importance	Frequency	Percent
Australian Government agency	Very important	4	100.0
State Government agency	Somewhat important	1	5.6
	Very important	17	94.4
	Total	**18**	**100.0**
University	Somewhat important	4	9.5
	Very important	38	90.5
	Total	**42**	**100.0**
Not-for-profit research organisation	Somewhat important	4	21.1
	Very important	15	78.9
	Total	**19**	**100.0**
Hospital or other healthcare provider	Somewhat important	1	14.3
	Very important	6	85.7
	Total	**7**	**100.0**
Private sector	Very important	8	100.0
Other	Very important	1	100.0
More than one institution	Very important	3	100.0

Q4   Are you more likely to employ staff with biostatistical expertise directly, engage contractors/consultants for relevant projects, or both equally? (please choose)
– Employ staff   – Engage consultants   – Both equally

The majority of respondents were most likely to employ staff with biostatistical expertise (78%) than to engage consultants (9%). A further 14% of respondents were likely to do both equally. (Table Q4.1)

Those most likely to directly employ staff were in the Australian Government agencies (100%), while those in the private sector were the least likely only to employ staff (50%) as they frequently do both (37%). Table Q4.2)

Table Q4.1: Likely mode of engagement of biostatisticians – employment vs. consultancy

Mode of engagement	Frequency	Percent
Employ staff	79	77.5
Engage consultants	9	8.8
Both equally	14	13.7
Total	**102**	**100.0**

Table Q4.2: Likely mode of engagement of biostatisticians – employment vs. consultancy

Type of agency	Mode of employment	Frequency	Percent
Australian Government agency	Employ staff	4	100.0
State Government agency	Both equally	3	16.7
	Employ staff	12	66.7
	Engage consultants	3	16.7
	Total	**18**	**100.0**
University	Both equally	4	9.5
	Employ staff	35	83.3
	Engage consultants	3	7.1
	Total	**42**	**100.0**
Not-for-profit research organisation	Both equally	2	10.5
	Employ staff	15	78.9
	Engage consultants	2	10.5
	Total	**19**	**100.0**
Hospital or other health care provider	Both equally	2	28.6
	Employ staff	5	71.4
	Total	**7**	**100.0**
Private sector	Both equally	3	37.5
	Employ staff	4	50.0
	Engage consultants	1	12.5
	Total	**8**	**100.0**
Other	Employ staff	1	100.0
More than one institution	Employ staff	3	100.0

Q5 **Do you think that there is an adequate supply of good applicants for positions that require specialist biostatistical training? (please choose)**
- Inadequate supply
- Satisfactory supply
- Not applicable
- Other (specify)

More than three quarters of respondents (78%) considered that the supply of good applicants for positions requiring specialist biostatistical training was inadequate, while 12% considered that the supply was satisfactory. (Table Q5.1)

Among those who responded 'other' (n = 9, 8.8%), three respondents said that it was 'patchy', 'mixed' or 'improving', while the remainder hadn't yet advertised and/or were not sure or didn't know. (Table Q5.1)

Table Q5.1: Respondents' views on supply of applicants

Supply of applicants	Frequency	Percent
Inadequate supply	79	77.5
Not applicable	2	2.0
Other	9	8.8
Satisfactory supply	12	11.8
Total	**102**	**100.0**

Q6 Over the past 12 months, how many positions requiring specialist biostatistical qualifications have you tried to fill?
– Please give your best estimate of the number of positions

– Were these positions full or part time?
– Number of days per week

Over the past 12 months, respondents had tried to fill 180 positions requiring specialist biostatistical qualifications. The majority of these were full-time positions (85.6%). (Table Q6.1)

The greatest number of the available positions were in the university sector (n = 55, 30.6%), and in government agencies, Australian and State combined (n = 52, 28.9%). (Table Q6.2)

Table Q6.1: Distribution of available positions in the last 12 months

Positions	Frequency	Percent
Full-time	154	85.6
Part-time	2	1.1
Both	18	10.0
No response	6	3.3
Total	**180**	**100.0**

Table Q6.2: Distribution of available positions in the last 12 months by type or employing organisation

Type of organisation	Positions	Frequency
Australian Government agency	Full-time	28
	Part-time	0
	Both	0
	No response	0
	Total	**28**
State Government agency	Full-time	24
	Part-time	0
	Both	0
	No response	0
	Total	**24**
University	Full-time	44
	Part-time	0
	Both	9
	No response	2
	Total	**55**

Type of organisation	Positions	Frequency
Not-for-profit research organisation	Full-time	22
	Part-time	2
	Both	3
	No response	0
	Total	**27**
Hospital or other healthcare provider	Full-time	5
	Part-time	0
	Both	1
	No response	0
	Total	**6**
Private sector	Full-time	26
	Part-time	0
	Both	2
	No response	4
	Total	**32**
Other	Full-time	1
	Part-time	0
	Both	0
	No response	0
	Total	**1**
More than one institution	Full-time	4
	Part-time	0
	Both	3
	No response	0
	Total	**7**

Q7   Over the past 12 months, how many positions requiring specialist biostatistical qualifications have you actually filled, in each of the following categories?
  – Honours-level graduate   – Masters-level
  – (Post)Graduate diploma   – PhD-level

Over the past 12 months, respondents had successfully filled 123.7 positions requiring specialist biostatistical qualifications. The greatest proportion of these positions was at PhD level (44%), followed by masters (26.8%) and honours (24.3%) levels. (Table Q7.1)

The positions that had been filled at PhD level were mostly in the university sector (n = 21, 38.5%), at government agencies (n = 20 combined, 36.7%) or in research organisations (n = 8.5, 15.6%). (Table Q7.2)

Table Q7.1: Qualifications of biostatisticians recruited in the last 12 months

Level of qualifications	Frequency	Percent
Honours	30.0	24.3
(Post)Graduate	6.0	4.9
Master's	33.2	26.8
PhD	54.5	44.1
Total	**123.7**	**100.0**

Table Q7.2: Qualifications of biostatisticians recruited in the last 12 months by type of employing organisation

Type of organisation	Level of qualifications	Frequency
Australian Government agency	Honours	0.0
	(Post)Graduate	1.0
	Master's	0.0
	PhD	14.0
State Government agency	Honours	6.0
	(Post)Graduate	0.0
	Master's	10.0
	PhD	6.0
University	Honours	8.0
	(Post)Graduate	3.0
	Master's	4.0
	PhD	21.0
Not-for-profit research organisation	Honours	3.0
	(Post)Graduate	1.0
	Master's	5.2
	PhD	8.5
Hospital or other healthcare provider	Honours	1.0
	(Post)Graduate	1.0
	Master's	0.0
	PhD	2.0
Private sector	Honours	12.0
	(Post)Graduate	0.0
	Master's	10.0
	PhD	3.0
Other	Honours	0.0
	(Post)Graduate	0.0
	Master's	1.0
	PhD	0.0
More than one institution	Honours	0.0
	(Post)Graduate	0.0
	Master's	3.0
	PhD	0.0
	Total	**123.7**

Q8 Over the next 12 months, how many positions would you expect to need to fill in each of the following categories of qualification in biostatistics (assuming that a supply of suitable applicants was available)?

- Honours-level graduate   – Masters-level
- (Post)Graduate Diploma   – PhD-level

Over the next 12 months respondents expected to fill 156.5 positions requiring biostatistical qualifications. The greatest proportion of these positions were at PhD level (40.3%), followed by those at masters level (25.2%). (Table Q8.1)

Of the total number of anticipated positions to be advertised in the next 12 months, the greatest number were expected to be in the university sector (n= 60, 38.3%) and in Australian and state government agencies (n = 30.5, 19.5%).

The largest number of anticipated available positions at PhD level in the next 12 months were also in the university sector (n = 26), in Australian Government agencies (n = 16), and other not-for-profit research organisations. (n = 10) (Table Q8.2)

Table Q8.1: Qualifications required for biostatisticians anticipated to be recruited in the next 12 months

Level of qualifications	Frequency	Percent
Honours	22.0	14.1
(Post)Graduate	3.0	1.9
Master's	39.5	25.2
PhD	63.0	40.3
Any	29.0	18.5
Total	**156.5**	**100.0**

Table Q8.2: Qualifications required for biostatisticians anticipated to be recruited in the next 12 months by type of employing organisation

Type of organisation	Level of qualifications	Frequency
Australian Government agency	Honours	2.0
	(Post)Graduate	0.0
	Master's	0.0
	PhD	16.0
	Any	0.0
	Total	**18.0**
State Government agency	Honours	1.0
	(Post)Graduate	1.0
	Master's	10.0
	PhD	1.0
	Any	9.5
	Total	**22.5**
University	Honours	7.0
	(Post)Graduate	2.0
	Master's	13.5
	PhD	26.0

Type of organisation	Level of qualifications	Frequency
	Any	11.5
	Total	**60.0**
Not-for-profit research organisation	Honours	3.0
	(Post)Graduate	0.0
	Master's	10.0
	PhD	10.0
	Any	6.0
	Total	**29.0**
Hospital or other healthcare provider	Honours	1.0
	(Post)Graduate	0.0
	Master's	0.0
	PhD	4.0
	Any	1.0
	Total	**6.0**
Private sector	Honours	7.0
	(Post)Graduate	0.0
	Master's	5.0
	PhD	2.0
	Any	1.0
	Total	**15.0**
Other	Honours	0.0
	(Post)Graduate	0.0
	Master's	1.0
	PhD	1.0
	Any	0.0
	Total	**2.0**
More than one institution	Honours	1.0
	(Post)Graduate	0.0
	Master's	0.0
	PhD	3.0
	Any	0.0
	Total	**4.0**
	GRAND TOTAL	**156.5**

Q9   Would your organisation consider supporting biostatistical traineeships (i.e. providing support to employees studying Masters-level biostatistics in a program such as the BCA's, by way of student fees and/or provision of study time)?

Approximately three quarters (76.5%) of respondents said they would consider supporting biostatistical traineeships. (Table Q9.1)

Table Q9.1: Respondents' interest in providing placements for trainees

	Frequency	Percent
No	24	23.5
Yes	78	76.5
Total	**102**	**100.0**

Q10 Finally we would like a little information about your position within your organisation. About how many people come under your area of management? How many of these have formal training in statistics or biostatistics?

There was significant diversity in the respondents' management levels, and/or respondents varied in their interpretation of what is meant by 'your area of management' as responses ranged from zero to 700 people. (Table Q10.1) The greatest number of people managed by one person was in the university sector (n = 700) but that respondent identified that this included staff and students. (Table Q10.2)

Of the total number of people managed by the respondents (n = 4720.6), 13.6% had formal training in statistics or biostatistics (n = 640.5) (Table Q10.1)

Table Q10.1:   Numbers of staff managed by respondents and numbers with biostatistics training

	N	Min	Max	Sum	Mean	Median
Number of managed staff by respondents	100	1	700	4720.6	47	15.5
Number of staff with biostatistical training	101	0	90	640.5	6	3

Table Q10.2: Numbers of staff managed by respondents and numbers with biostatistics training, by type of employing organisation

Type of organisation	Staff category	No. of respondents	Min	Max	Mean	Median
Australian Government agency	Staff managed	4	15	150	79	75
	Trained in biostats	4	13	90	40	27.5
State Government agency	Staff managed	18	2	180	36	16
	Trained in biostats	18	0	16	4	3
University	Staff managed	42	1	700	66	20
	Trained in biostats	42	0	24	6	3.5
Not–for–profit research	Staff managed	19	3	240	34	12
	Trained in biostats	19	0	8	4	3
Hospital or other healthcare provider	Staff managed	6	1	35	14	6
	Trained in biostats	7	0	5	2	2
Private sector	Staff managed	7	2	160	36	18
	Trained in biostats	7	2	21	10	11
Other	Staff managed	1	3	3	3	3
	Trained in biostats	1	1	1	1	1
More than one institution	Staff managed	3	3	10	6	4
	Trained in biostats	3	1	2	2	2

Q11 We would be very interested to receive any comments you have about the BCA program (see www.bca.edu.au), if you are familiar with it, or about professional training in biostatistics more generally.

The last question was an open format to invite comments about the BCA program, as well as on professional training in biostatistics more generally. Participants responded as 'free text'.

Of the 102 survey respondents, fifty-five provided comments by responding to Question 11. These responses were classified into the following six categories:
    a. General comments about the BCA;
    b. Issues related to trainees;
    c. Suggestions regarding training content;
    d. Recruitment within own organisation: (i) experiences with recruitment, and (ii) skills required;
    e. Broader issues about training and recruitment in Australia: and
    f. Comments on the survey itself.

A brief summary for each category is provided below.

Feedback about the BCA
The majority of respondents providing comments in Question 11 were familiar with the BCA. This was expected as the survey was distributed to those on the BCA's contact list. The five respondents who said they were not familiar with the BCA were from various sectors: the hospital sector (2), the university sector (1), a not-for-profit research group (1), and one from the 'other' category.

Almost all of the feedback about the BCA were very positive and reflected widespread enthusiastic supportive for the initiative as a whole. The BCA for example, was described as follows: '*producing well-rounded statisticians*'; '*provide comprehensive training*'; '*an extremely good course*'; '*develops skills directly relevant to the research work we do*'; '*stimulating and rewarding*'; and '*a highly successful collaboration which is addressing the shortage of biostatisticians in Australia*'.

BCA trainees
Respondents who had worked with BCA trainees described them as valuable additions to the workforce with the ability to contribute to the work and output of an organisation. Two agencies not currently participating in the trainee placement program expressed enthusiasm to become involved (the National Drug and Alcohol Research Centre and CSIRO Division of Mathematical and Information Sciences). However, some respondents pointed out that any potential for an expansion of the BCA trainee program in the health sector is likely to be severely hindered by existing budgetary constraints and freezes on staff recruitment.

Suggestions for BCA training content

Some respondents provided specific suggestions on topics to be added to or expanded within BCA courses. These were as follows:

- Time series analytical methods, spatial epidemiological methods, advanced survey methods, infectious disease modelling methods, and the use of more examples of longitudinal data analysis using linked datasets;
- More foundational aspects of biostatistics, such as probability and distribution theory, and the R computing environment;
- More awareness of the regulatory environment and drug development;
- Health services research (differentiated from academic research), and practical exposure and experience with the 'support-aspects' of health research (e.g. sample size and confidence across a diversity of research study designs); and
- Experience with programming in SAS.

A query as to why the course on Bayesian statistics was not being offered in 2009 was also received.

Finally, it was also suggested that the BCA establish a seminar program for a broader public health audience such as researchers that '*have basic training in biostatistical principles but don't have immediate access to or have only an occasional need to access biostatisticians. For example, 1-2 day workshops in applied statistics for survival analysis, logistic regression etc.*'

Recruitment of biostatisticians within respondents' organisations

Recruitment experience

The majority of those who commented on their past experience of recruiting for biostatisticians noted significant difficulties with filling available positions, mostly due to a shortage or total lack of suitably qualified candidates. One respondent reported that successful recruitment required modification of the advertised job title to 'epidemiologist'. However, another respondent, from the university sector, noted that a recently advertised position attracted excellent applicants with PhDs in computer science. This was noted as a potentially positive sign for the future.

Required skills

'*Issues for us include finding people with biostats skills / training who are prepared to take control and run a project in entirety, including preparation of large and complexly linked data sets, all analyses, and report writing. Those who just want to analyse data that has been cleaned and prepared for analysis are of no interest to us*'.

Those commenting on the types of positions that they had sought to fill tended to emphasise the applied and multi-skilled nature of the positions. On the whole, employers seem to require biostatisticians who are flexible and combine biostatistics with other research and project management skills, thus having abilities to design and lead projects and provide support to colleagues.

Broader issues about training and recruitment in Australia

As noted above, some respondents reflected on the shortage of suitable candidates when recruiting for biostatisticians. Others also drew attention to a perception of insufficient opportunities for trainee placements that enable biostatisticians to obtain appropriate 'hands-on' experience. Permanent employment opportunities for biostatisticians were also perceived by some respondents as limited.

Comments on the survey

Two respondents were sufficiently frustrated by Question 9 to comment on it in Question 11. In particular, they found the Yes / No format inappropriate as neither option was applicable to their organisational setting. They were also frustrated by the fact that, despite neither option being suitable, they were unable to skip the item and complete the survey without providing an answer.

3.   Discussion

3.1   Commentary on the main findings

The survey results suggest the existence of substantial current and future demands for highly trained biostatisticians – over a two-year period (2008-09), respondents indicated a requirement for almost 300 biostatisticians, mostly in full-time positions. However, approximately three-quarters of the respondents indicated that the supply of suitably-qualified applicants for positions in biostatistics remained inadequate, suggesting that the need for the BCA training program continues. The role of BCA in coordinating and providing specialist biostatistical training for Australian statisticians was widely perceived by survey respondents as important. Overall, the qualitative feedback about BCA programs was positive and reflected widespread appreciation of and support for the role of the BCA.

Although the distribution of survey respondents did not necessarily reflect the distribution of all current and potential Australian employers of biostatisticians, the relatively high frequency of responses from the research sector (including universities) and government agencies suggests that these sectors would continue to be the main employers in the future.

The survey findings also suggest that the main employers of biostatisticians are more likely to recruit biostatisticians as employees rather than engaging them as consultants. This implies that high-level biostatistical capacity is valued within organisations, that biostatistics is perceived as a core function, and that the need is ongoing rather than intermittent. Some private-sector organisations may have different requirements; although there were only a small number of private-sector respondents, a relatively greater proportion were likely to engage biostatisticians as consultants. The survey also showed that almost half of the specialist biostatistician positions that were recruited in the last 12 months were at PhD-level.

The survey revealed considerable enthusiasm for support of biostatistical traineeships, with more than three-quarters of respondents indicating an interest in providing trainee placements.

3.2   Caveat

The survey findings should be interpreted in the light of the following limitation. The survey was distributed to individuals who were identified by the BCA as likely to have an interest in biostatistical services or as potential employers of biostatisticians. Those registered on the 'anzstat' mailing list were also invited to participate but respondents from this source were not identified. Therefore the survey recipients were not necessarily representative of all potential employers of biostatisticians in Australia. In particular, the private sector was likely to have been under-represented in the survey. It follows that the survey is likely to have under-estimated the demand for biostatisticians, both as employees and as consultants.

Appendices

Appendix 1

The Biostatistics Collaboration of Australia (BCA) is conducting a survey to estimate the demand for (met and unmet) specialist biostatistical training in Australia. We would greatly value your input, and we ask you to complete a short questionnaire.

This should take no more than 10 minutes.

As you are probably aware, the BCA offers a national postgraduate program in biostatistics, delivered by a consortium of Australian universities. The BCA mission is to train well-qualified biostatisticians to meet needs in all areas of health and medical research. The BCA website, www.bca.edu.au provides further details of the intended capabilities of its graduates.

The Survey

To make completing the survey as easy as possible, a web questionnaire is available on-line at http://surveys.med.usyd.edu.au/limesurvey/index.php?lang=en&sid=71429&token=cyqpdzmsy2ja34p

The survey is best completed by people in positions who make decisions about potential recruitment of biostatisticians, or those delegated to respond on their behalf. If there is someone more appropriate than you in your organisation who can complete this questionnaire, please forward this email to him or her.

We would very much appreciate receiving your response by 6 March 2009.

If you do have any queries, please don't hesitate to call the BCA Executive Officer:
Erica Jobling
phone: 02-9562 5076
email: erica@ctc.usyd.edu.au

BCA has commissioned the Sydney Health Projects Group (SHPG), Faculty of Medicine, University of Sydney, to manage the survey, analyse the data and produce a report.

Thank you for your participation.
Erica Jobling, for the BCA Steering Committee

The BCA Survey Panel overseeing this project comprises:

- Prof Judy Simpson, School of Public Health, University of Sydney; Chair, BCA Steering Committee
- Prof John Carlin: Centre for Molecular, Environmental, Genetic & Analytic (MEGA) Epidemiology, School of Population Health, University of Melbourne; member, BCA Steering Committee
- Prof David Roder, Cancer Council of South Australia, Chair, BCA Advisory Board
- Prof Andrew Forbes, Dept of Epidemiology and Preventive Medicine, Monash University, Chair, BCA Teaching Committee
- Ms Erica Jobling, Executive Officer, BCA
- A/Prof Ian Marschner, Pfizer Aus. Pty Ltd, member, BCA Steering Committee and BCA Advisory Board
- Dr Philip McCloud, Roche Products Aus. Pty Ltd, Chair, Australian Pharmaceutical Biostatistics Group; member, BCA Steering Committee and BCA Advisory Board
- Ms Helen Moore, Centre for Epidemiology and Research, NSW Department of Health, member, BCA Steering Committee

The demand for specialist biostatistical training in Australia

A Biostatistics Collaboration of Australia (BCA) Survey

1. *What type of organisation do you work for?

   ☐ Australian Government agency

   ☐ State Government agency

   ☐ University

   ☐ Not-for-profit research organisation

   ☐ Hospital or other health provider

   ☐ Private industry

   ☐ Other

2. **What is the name of your organisation and, where relevant, the branch / section / department?**

3. *How important is it to your organisation to have staff with specialist training in biostatistics?
   [Note that "specialist training in biostatistics" might include training in Statistics along with demonstrated capacity to work on health-related problems.]

   | Please choose.. ▾ |
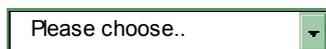
   Not important at all / Somewhat important / Very important / No opinion

   ❓*By "specialist training and qualifications in Biostatistics" we mean academic programs that provide a mathematically-based degree specialising in biostatistics, although this could also encompass other courses in (applied) statistics. We recognise that employers will normally have broader selection criteria than formal, knowledge-based qualifications, but this survey is based on the view that these qualifications would often be regarded as a necessary though not sufficient criterion for an identified role. This survey seeks to identify the demand for specialist qualifications in biostatistics.*

4. *Are you more likely to employ staff with biostatistical expertise directly, engage contractors/consultants for relevant projects, or both equally?**

| Please choose.. ▼ |

Employ staff / Engage consultants / Both equally

5. *Do you think that there is an adequate supply of good applicants for positions that require specialist biostatistical training?**

| Please choose.. ▼ | Other: [   ]

Inadequate supply / Satisfactory supply / Not applicable / Other (specify)

6. **Over the past 12 months, how many positions requiring specialist biostatistical qualifications have you tried to fill?**

Please give your best estimate of the number of positions: [   ]

Were these positions full or part time? [   ]

Number of days per week [   ]

7. **Over the past 12 months, how many positions requiring specialist biostatistical qualifications have you actually filled, in each of the following categories?**

Honours-level graduate [   ]

(Post)Graduate Diploma [   ]

Masters-level [   ]

PhD-level [   ]

8. **Over the next 12 months, how many positions would you expect to need to fill in each of the following categories of qualification in biostatistics (assuming that a supply of suitable applicants was available)?**

Honours-level graduate [   ]

(Post)Graduate Diploma [   ]

Masters-level [   ]

PhD-level [   ]

Any of the above [   ]

9. *Would your organisation consider supporting biostatistical traineeships (i.e. providing support to employees studying Masters-level biostatistics in a program such as the BCA's, by way of student fees and/or provision of study time)?

| Please choose.. ▾ |

Y / N

10. Finally we would like a little information about your position within your organisation.

About how many people come under your area of management? [   ]

How many of these have formal training in statistics or biostatistics? [   ]

11.   We would be very interested to receive any comments you have about the BCA program (see www.bca.edu.au) , if you are familiar with it, or about professional training in biostatistics more generally.