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Undergraduate public health education: a workforce perspective

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Objective: To describe the career paths of students who majored in public health at the undergraduate level and to assess the skills and knowledge these graduates believed were most useful to them in the public health workforce. **Method:** A telephone survey was conducted of all graduates from Adelaide University's Bachelor of Health Sciences degree from 1992-99 who had majored in public health (124 graduates). **Results:** The response rate to the graduate survey was 71 %. Using the definition of public health functions from the National Delphi Study on Public Health Functions to delineate the public health workforce, 59% of respondents were employed in public health. Graduates working in public health valued generic skills such as communication and collaboration more highly than more specific public health skills and knowledge areas. However, they also believed their undergraduate course would have been improved by a more practical orientation. **Conclusions:** A high proportion of graduates from this generalist degree who major in public health find employment in the public health workforce. They greatly value the generic skills associated with their undergraduate public health education and believe their entry into the workforce would have been further facilitated by stronger links between their academic program and the working environment of public health professionals. **Implications:** Studies of workforce training programs in public health must differentiate between the educational needs of undergraduate and postgraduate students. In particular, strategies need to be developed to provide stronger links between undergraduate students and the public health workforce.

Keywords

workforce, education:, undergraduate, public, perspective, health

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Traditionally, most public health professionals in Australia have undertaken a postgraduate course in public health after initial qualification in any of a wide range of health or social sciences.¹ However, there are now significant numbers of graduates from undergraduate health programs in Australian universities contributing to the public health workforce in this country. Little is known about these graduates, their career aspirations and career paths.

This study aimed to describe the post-graduation career paths of students from Adelaide University who majored in public health at the undergraduate level. It also aimed to assess the skills and knowledge that graduates believed were most useful to them in taking their places in the public health workforce.

In recent years there has been increasing interest in the interface between all tertiary education programs and the workforce. Evaluation of workforce preparation aspects of public health programs is complicated by the developing interpretation of the meaning of public health, reflected in an increasing diversity of public health workforce functions. In 1997, the World Health Organization conducted an international Delphi study² that defined 37 essential public health functions and demonstrated that consensus could be reached globally on the core areas of public health. However, it was stressed that these functions should also be defined within specific national contexts, and, to this end,

the National Public Health Partnership (NPHP) in Australia conducted a National Delphi Study on Public Health Functions, which released its findings in January 2000.³ The NPHP uses this consensus on core public health functions to provide a structured and ongoing mechanism for national public health workforce development.

In the introduction to the second round of the Delphi study, public health functions are defined as 'a set of activities which protect, promote or improve public health, and prevent illness, injury and disability. These activities may be directed at entire populations, priority sub-populations, or individuals in some circumstances. Public health functions may be carried out by public and private organisations, within and outside the health sector.'³ This was the definition used to set the boundaries of the public health workforce for this study.

Methods

The National Delphi Study on Public Health Functions in Australia identified 44 functions of public health falling into 11 major categories.⁴ These functions were used as the basis for the development of a list of skills and knowledge areas considered important in the training of the public health workforce. Interviews with employers of public health graduates also provided input into this list, which was used as the basis of a survey questionnaire. All graduates from

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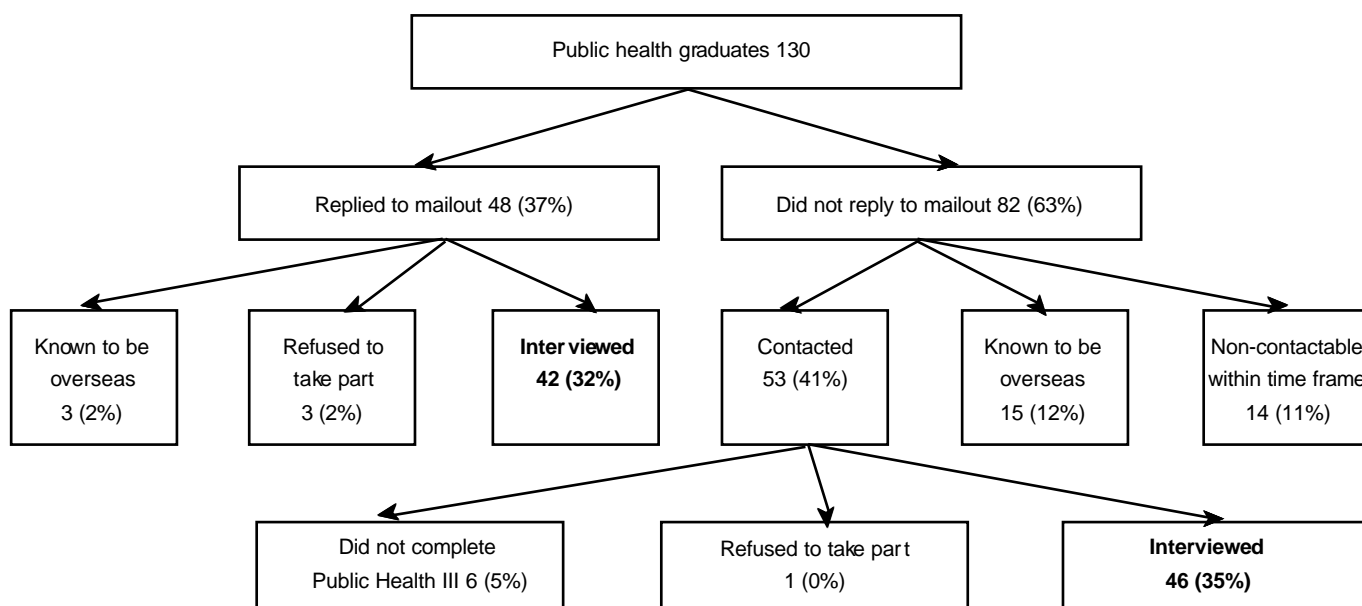
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Figure 1: Flow chart of survey.



Adelaide University's Bachelor of Health Sciences degree (BHealthSci) who had majored in public health between 1992 (when the first group graduated) and 1999 were surveyed. Names and addresses of all students who had studied Public Health III between 1992-99 were obtained from the student records of Adelaide University.

An initial mail-out to all graduates described the aims of the study and asked for their co-operation with a telephone survey. Graduates were asked to return a tear-off slip indicating their preferred times and numbers for telephone contact. Meanwhile, the draft questionnaire was piloted with two public health graduates and finalised in a form appropriate for administration by telephone.

The questionnaire asked respondents for information about their career paths post graduation, including any further qualifications they had completed or were pursuing. They were then asked to rate each of 15 skills and knowledge areas on a Likert scale of 1 to 5, with 1 indicating this was 'not useful' and 5 indicating it was 'very useful' to them in their current employment. They also rated the same items on a scale of 1 to 5, with 1 indicating they believed they had been 'poorly equipped' and 5 'well equipped' in these areas by their undergraduate public health education. Opportunity for open-ended comments on their undergraduate public health education was also provided in the questionnaire.

The original list of 130 graduates was found to include six people who, on contact, stated that they had not completed the subject Public Health III and thus were excluded from the survey.

The final response rate was 71% (88 of 124 graduates with public health majors). The main difficulty encountered was the high mobility of the graduate population, with 18 of the 124 potential respondents overseas at the time of the survey (14.5%). Twenty graduates (16.1%) were living in States other than South Australia, of whom 16 were interviewed.

Various strategies were used to maximise the survey response

rate within the available time frame. Where possible, interviewees were asked for information about any of their peers from the same graduating year for whom no current contact details were available. This use of the graduates' informal networks resulted in telephone numbers, e-mail addresses or workplaces of their peers. Graduates were classified as 'non-contactable' after at least five attempts to make contact at the most recent telephone number available.

Survey responses were coded and analysed using EpiInfo 6 software. The definition of public health functions from the National Delphi Study on Public Health Functions³ (quoted above) was applied to the classification of respondents by employment status. The database constructed was used to describe the respondent population, to compare respondent and non-respondent populations, and to analyse the frequency of responses. Allowance was made for recording individual comments made by graduates.

Results of the graduate survey

The age at graduation of the 88 respondents ranged from 19 years seven months to 44 years, with a median age of 21 years three months (graduation was taken as the end of the year in which the student qualified for their degree). Seventy-five per cent of respondents were female.

The majority of respondents (79%) had combined their public health major with another major study in their degree course. More than half (55%) had studied another major subject from among the biological sciences (including psychology). Other major studies combined with public health were geography, politics, law and economics.

The respondent and non-respondent populations did not differ significantly in terms of age at graduation or gender balance. The

response rate did, however, vary by year of graduation – from 52% (1994 graduates) to 88% (1996 graduates), with a trend towards a higher rate among more recent graduates.

Respondents were asked for details of any further qualifications they had acquired since graduating with a BHealthSci from Adelaide University. Seventy-five of the 88 respondents (85%) had completed or were studying for a further qualification (see Table 1). Those enrolled in further study included both full-time and part-time students.

Fifty of 88 (57%) of respondents had completed or were enrolled in a postgraduate qualification in any field, including 20 (23%) who had completed or were enrolled in postgraduate courses in public health. These courses included honours, graduate diplomas, masters degrees and, in one case, a PhD in public health.

Respondents were also questioned on their current employment and employment history. At the time of the survey, 52 (59%) of respondents were in the public health workforce; 19 (22%) were employed in areas other than public health; and 17 (19%) were either full-time students or unemployed.

Those working in public health were doing so in a wide range of roles, reflecting the diversity of the public health workforce. The most common major activity was reported as 'health research' (44% of respondents working in public health). Other less frequent activities were health program support (10%); health planning and policy (9%); health education (8%); health management (8%); and health promotion (8%). Examples of activities difficult to categorise included providing information technology support in a metropolitan Division of General Practice; finding crisis accommodation for the disabled; and work in rehabilitation and workers' compensation.

It appears that the BHealthSci degree with a public health major has been a first career step for many of its graduates. Graduates have a high level of involvement in the public health

Table 1: Respondents by further qualifications.

Qualification	Completed		Currently enrolled		Total	
	n	%	n	%	n	%
Post-grad qualif. in public health	13	29	7	23	20	26
Grad Dip/Cert. health-related	9	20	3	10	12	16
Grad Dip/Cert. non health-related	7	15	3	10	10	13
Other postgrad. qualification	3	7	5	17	8	11
Medicine	2	4	3	10	5	7
Second undergrad. degree, health-rel.	3	7	3	10	6	8
Second undergrad. degree, non-health	8	18	6	20	14	19
Total	45	100	30	100	75	100

workforce, either with their BHealthSci degree alone or in combination with further post-graduate studies.

Some sampling bias may have been introduced, as the largest group not interviewed were those graduates who were overseas at the time of the survey. From anecdotal evidence, the majority of these were continuing their studies or taking holidays (although some were taking up employment opportunities). Thus, it is possible that a slight bias towards those currently employed was introduced by not interviewing this group.

The survey methodology also meant that respondents tended to be those interested enough to respond to the initial mail-out and those who had either not moved from their address during their university years or had kept in contact with friends or colleagues from this time. This may have introduced some bias towards those working in public health, particularly as this group

Table 2: Usefulness ratings of skills and knowledge areas.

Skill or knowledge area	Rating by graduates working in public health (n=53)		
	Very useful	Useful	Not useful
Verbal and written communication skills	98%	0	2%
Ability to work in collaboration with others	94%	4%	2%
Computer literacy	85%	11%	4%
Skills in reading and summarising literature	70%	15%	15%
Quantitative skills, data collection/analysis	59%	24%	17%
Health planning and policy-making	59%	11%	30%
Epidemiology	57%	15%	28%
Skills in evaluation of interventions	51%	30%	19%
Understanding of the Australian health system	49%	32%	19%
Psycho/social perspectives of health	49%	28%	23%
Qualitative skills, data collection/analysis	47%	32%	21%
Biostatistics	41%	19%	40%
Health promotion theory and practice	40%	17%	43%
Occupational health and safety	30%	25%	45%
Environmental health issues	19%	36%	45%

would be expected to feel sympathy with the aims of the study and an interest in its outcome.

Fifty-three respondents identified as members of the public health workforce were asked to rate the usefulness of 15 listed skill and knowledge areas to them in their current jobs (this number included one respondent who was not working in public health but had been until very recently).

Respondents working in public health consistently rated generic skills as most useful to them in their jobs. These included skills in verbal and written communication, working in collaboration with others and computer literacy. Skills in reading professional literature, health planning and policy-making, and quantitative skills in data collection and analysis also rated highly. These skills were all rated as more useful than any public health content areas. Within public health, the most useful content areas were epidemiology and understanding of the Australian health system.

In addition, these respondents were asked to nominate any other skills or areas of knowledge that they felt were useful to them, but had not been listed for comment. The majority (60%) did not add any other items. Those who did add items mentioned a wide range of skills, all of which they believed they had acquired since graduation. These were predominantly 'time management' and 'people management' skills such as multi-tasking, networking and negotiation skills.

All respondents were asked to rate how well their undergraduate public health education had equipped them with each of the listed skills and knowledge areas.

A high proportion of the respondents thought they had been 'well-equipped' with the generic skills of verbal and written communication, working in collaboration with others and making use of professional literature. The skill of computer literacy rated badly, although 80% of respondents working in public health had rated this as 'very useful' to them in their jobs. Clearly, they had

acquired this skill from sources other than their undergraduate public health education.

All respondents were also asked for their opinions about their undergraduate public health education as a preparation for the workforce. The 88 respondents made a total of 157 comments. Thirty-six per cent of these comments were positive statements about the course experience, including content areas and preparation for work. An additional 42% indicated the degree was too generalist to provide necessary employment skills. There was strong feeling that a more practically oriented course would be more useful in gaining employment. Eight of these were comments suggesting incorporation of a work experience component into the course. Fourteen per cent of comments concerned specific aspects of the course such as subjects that should or should not be included. The final small group of comments were from respondents who had not attempted to work in public health.

Discussion

In recent years, a number of Australian universities have introduced broad-based undergraduate programs allowing students to major in public health. At Adelaide University, the Bachelor of Health Sciences degree course has offered a public health stream since 1990. Other undergraduate public health programs are offered at La Trobe University (in the Faculty of Health Sciences); Queensland University of Technology, which offers a Bachelor of Health Science (Public Health) within the School of Public Health; Curtin University of Technology (in the School of Public Health, Division of Health Sciences); and the University of Western Australia, which offers a Bachelor of Health Science with a compulsory major in public health.

There is ongoing debate about the role of an undergraduate public health program and these institutions differ in their interpretations of this role according to the context in which the

Table 3: How well graduates were equipped with skills and knowledge areas.

Skill or content area	% of respondents rating themselves as: (n=88)		
	Well-equipped	Adequately equipped	Poorly equipped
Ability to work in collaboration with others	79%	16%	5%
Skills in reading and summarising literature	78%	16%	6%
Verbal and written communication skills	67%	28%	5%
Epidemiology	60%	33%	7%
Understanding the Australian health system	59%	24%	17%
Occupational health and safety	53%	25%	22%
Qualitative skills, data collection/analysis	49%	39%	12%
Health promotion theory and practice	46%	40%	14%
Psycho/social perspectives of health	45%	30%	25%
Health planning and policy-making	44%	31%	25%
Quantitative skills, data collection/analysis	39%	47%	14%
Environmental health issues	39%	39%	22%
Biostatistics	38%	34%	28%
Skills in evaluation of interventions	30%	43%	27%
Computer literacy	6%	24%	70%

program has been developed. The Adelaide University course is a more traditional generalist public health program, while other courses offer more specifically oriented training for areas of public health such as the Bachelor of Health Science (Health Promotion) from Curtin University of Technology. This study has thus focused on graduates of a program at the generalist end of the spectrum of undergraduate courses in public health, who may be expected to have a lower participation in the public health workforce than those from some of the other courses. However, the functions of the public health workforce, and its requirements for appropriately educated participants, are consistent nationally, and thus the opinions of these graduates have relevance not only to the ongoing evaluation of their own course, but to undergraduate public health education in general.

An increase in undergraduate student enrolments in public health across Australia will also raise questions about the relative merits of undergraduate versus graduate programs in public health. Further research is required on the place of undergraduate education in public health in the career pathway. In particular, longitudinal career comparisons of graduates of undergraduate health programs with those taking the more traditional pathway of graduate studies in public health would be useful.

This study looked at the career paths of Adelaide University graduates who had majored in public health. A high proportion of survey respondents (85%) had completed or was studying for further qualifications. This is an indication of the generalist nature of the undergraduate degree and its common function as a stepping stone in a young person's career. However, it is worth noting that, of the 13 respondents with no further qualifications, 11 were working in public health. The generalist degree alone can thus provide an entry point into the workforce. It appears that graduates already in the workforce are identifying areas of further study they wish to pursue, rather than finding it necessary to obtain further qualifications to find employment.

A high proportion (59%) of the graduates was in the public health workforce at the time of the survey. If all non-respondents to the survey were outside the public health workforce, the proportion working in public health is 42% – still a high figure for graduates of a degree course regarded as generalist rather than vocational.

The high level of engagement of graduates in the public health workforce gives particular relevance to their opinions on the relevance and adequacy of their public health education. The survey showed that they highly value the generic skills traditionally associated with tertiary education, and rate these as most useful to them in their current jobs. This contrasts with the recommendations arising from the literature on public health education and public health workforce studies. A synthesis of these recommendations by Loos⁵ presents them as content-based, with skills and competencies listed within major 'instructional domains'. Rotem's 1995 study of the public health workforce⁶ was influenced strongly by the existing emphasis on postgraduate public health programs. He recommended more intensive, context-specific training in public health competencies in the basic training of all health

workers. Nelson⁷ recommended the inclusion of the core 'enabling' competencies to enable the integration and application of the traditional disciplines taught in schools of public health, and Kickbusch⁸ argued that a new public health leadership is required in response to global public health challenges, creating new challenges for public health education. These studies do not look specifically at the education of undergraduate students in public health.

Such emphases are appropriate for the postgraduate courses for which the recommendations have been formulated; however, this survey shows that graduates of an undergraduate degree course see things rather differently. It appears that the differing educational needs of undergraduate and postgraduate students are such that any studies of workforce training programs must differentiate between these groups. In particular, postgraduate programs should not be duplicated at the undergraduate level without recognising that undergraduate students need and greatly value the development of the generic skills traditionally associated with generalist tertiary-level education.

Despite their success in gaining employment, the respondents also believed a more practically oriented course would be useful as a preparation for the workforce. One way to address concerns over links between the academic program and the workforce would be to introduce a work experience component into the course (eight of the respondents made this specific suggestion). Field placements are a common feature of postgraduate public health courses, particularly in the United States.⁹ Some Australian undergraduate degree courses include formal work experience components, but this has been limited almost entirely to vocational courses such as architecture and engineering. It is a challenge for a generalist course, in which students may be studying other major subjects, to provide such experience.

However, all Australian undergraduate public health programs are now grappling with the issue of interfacing with the workforce and many now have some workforce involvement before graduation.

The National Undergraduate Public Health Internship and Scholarship Scheme (NUPHISS), funded with an Innovations grant through the Public Health Education and Research Program, is a response to these issues. NUPHISS is a consortium of four universities, coordinated by the Department of Public Health (Adelaide University), and with participation from the School of Public Health, Curtin University of Technology; the Department of Public Health, University of Western Australia; and the School of Public Health, Queensland University of Technology. The NUPHISS consortium aims to use scholarship and internship programs to enhance the responsiveness of educators of undergraduate public health students to the needs of public health employers.

An alternative strategy to provide career information and link students with practising professionals would be a student-mentor program, with students matched to public health professionals. Mahayosnand and Stigler¹⁰ have described a National Public Health Student-Mentor Program pilot study and suggested it could be developed using the concept of e-mentoring to allow a

national database to overcome geographical restrictions on student-mentor pairings. A program of this type, adapted to local conditions, could provide a mechanism for linking students to the public health workforce during their undergraduate years.

Finally, specific learning strategies can help address the concerns of graduates for a more practical orientation of the program. Many medical and paramedical courses now incorporate the techniques of problem-based learning in their teaching. This approach uses a series of practical problems as the starting point of learning, with the student seeking the knowledge of disciplines, facts, and procedures that are needed to solve the problems.¹¹ This can provide an environment for both the practical orientation of coursework and the acquisition of generic skills such as those valued by the respondents to this survey.

Conclusion

Studies of the changing functions of public health and the attributes required of its workforce have often been based on the opinions of practising professionals, who have viewed the training requirements from a postgraduate perspective. The voices of graduates of undergraduate health programs, usually relatively recent entrants into the workforce, have not been heard.

This survey found that graduates from undergraduate public health programs are an important part of the public health workforce. As such, their educational needs should be given voice. Fifty-nine per cent of graduates of Adelaide University's undergraduate public health program were working in public health at the time of the survey. This group of graduates placed a higher value on the generic skills acquired from their undergraduate public health education than the more specific skills and content areas relating to public health. They also believed their entry into the workforce would have been facilitated by stronger links between the academic and working environments.

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