Tasmania
DEPARTMENT of HEALTH and HUMAN SERVICES

Tasmanian Department of Health and Human Services

Agency Health Professional Reference Group

Allied Health Professional Workforce Planning Group

Allied Health Professional Workforce Planning Project

Medical Scientist Information

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3 Preface

This Medical Scientist Information should be read in conjunction with the main Allied Health Professional Workforce Planning Project Discussion Paper.

4 Overview

Medical scientists (also known as medical laboratory scientists) conduct medical laboratory tests to provide information for diagnosing, treating and preventing disease.

Three and four-year medical science courses are offered through universities in all states of Australia. The School of Human Life Sciences within the University of Tasmania Faculty of Health Science offers a three and a half year full-time Bachelor of Biomedical Science degree at the campus in Launceston. Graduates from the course meet the academic requirements for direct entry into the profession of medical science and the Australian Institute of Medical Scientists (AIMS), the major professional organisation for medical scientists,

Generally there are 24 new students commencing in the course in Tasmania each year and between six and twelve students obtain employment in Tasmania upon graduation.

There are no formal AIMS requirements for a medical scientist to undertake when re-entering the profession after a period of absence.

As at March 2002, the DHHS medical science workforce consisted of 81 medical scientists employed in 73.79 FTE positions. All medical scientists were employed in the Royal Hobart and Launceston General Hospitals of the Hospitals and Ambulance Service Division. In the north west region there were no medical scientists employed directly through the DHHS. The DHHS pathology services in this region are provided through a contract between the DHHS and a private pathology service.

It required 1.1 medical scientists to fill one FTE position indicating a low number of part-time staff or positions.

Females comprised 53 per cent of the DHHS medical scientist workforce.

The median age of the DHHS medical scientist workforce was 42 years. This matched the median age of all allied health professionals employed by DHHS, which was 42 years.

In the years 2000 and 2001, an average of 6.5 medical scientists left the DHHS per year and an average of 8.5 DHHS medical scientist positions were advertised per year. Compared to other allied health professions. medical science had a low average staff turnover rate, at approximately 8 per cent per year for those two years.

There were no medical scientist vacancies of at least six months duration identified in 2001.

The ratio of medical scientists to population in Tasmania was below the national average. This may be due to the facts that a number of specialised tests are carried out in mainland centres and there are differences in staffing organisations and ratios in pathology laboratories across Australia.

The Commonwealth Department of Employment and Workplace Relations stated that across Australia, job prospects for medical scientists are good and that the turnover for medical scientists is moderate.

There was a service gap identified for DHHS medical scientists who specialise in the areas of cytogenetics and cytology. Staff in these areas provide testing for genetic screening of pre-term infants, infants and adults and genetic typing of diseases.

A number of workforce planning issues specific to the DHHS medical scientist workforce were highlighted through consultations with the professional organisation and DHHS employees:

- Increasing workloads for medical scientists.
- The introduction of ‘black box’ technologies has resulted in the de-skilling of medical scientists. However, in the United States of America another role was emerging for medical scientists in the area of laboratory quality control.
- The impact of the introduction of 'core' laboratory approaches to processing work has increased the need for multi-skilled medical scientists.
- Restructuring of the medical scientist workforce has resulted in limited opportunities for career progression within DHHS and the loss of specialist expertise has resulted in higher levels of work stress for less experienced staff.
- The provision of a twenty four-hour service has affected the lifestyle opportunities for DHHS staff. Tasmanian representatives of AIMS said that the change away from regular work patterns may be attractive to some staff for a limited number of years, but that the documented effects of shiftwork, e.g. reduced life expectancy, increased stress and family break-up were a long term problem.
- There were significant differences in interstate rates of pay, which have made attraction of medical scientists to positions in DHHS difficult, unless the individual found the Tasmanian lifestyle attractive.
- Pathology services are required to maintain a broad range of staff skills and equipment due to the wide range of diagnostic tests that may be ordered. Many of these tests are outdated. Rationalisation of tests provided by DHHS pathology services would improve efficiencies.
- The public sector employs approximately 65 per cent of the Tasmanian medical scientist workforce. More medical scientist technicians are employed per medical scientist in the private sector. The public sector offers more variety in workloads and the opportunity to interact with a

wider organisation; however, there is an occasional movement of senior medical scientist staff to the private sector in Tasmania.

- Consultations with local representatives of AIMS provided the information that there were few opportunities for medical scientists to undertake CPD within work time, mostly due to high staff workloads.
- Representatives of the Tasmanian branch of AIMS also stated that it was essential for an undergraduate course for medical scientists to continue to be provided in Tasmania to ensure an adequate supply of medical scientists and that it may have to encompass new areas, e.g. genetic testing rather than traditional science subjects.

5 Description of the medical science profession

Medical scientists (also known as medical laboratory scientists) conduct medical laboratory tests to provide information for diagnosing, treating and preventing disease. They work as part of a team with doctors, pathologists, scientists, technicians and laboratory assistants.

Some areas in which medical scientists may work are:

- Anatomical Pathology: tests on samples of tissue that have been surgically removed from the body
- Clinical Chemistry (Biochemistry): tests on blood and body fluids
- Cytology: tests on body tissues or fluids looking for cancer or cell changes that may lead to cancer
- Haematology: tests on blood in order to diagnose diseases such as leukaemia and iron deficiency anaemia
- Medical Microbiology: tests on swabs, urine, and faeces to help to isolate and identify micro-organisms associated with various diseases and infections.

Most medical scientists work in the health industry, especially in hospitals. There are also employment opportunities in universities, research organisations and the private sector.

5.1 Description of occupations related to medical science

5.1.1 Medical laboratory technicians

Medical laboratory technicians carry out routine laboratory tests and other procedures for use in the diagnosis and treatment of diseases and disorders of the human body.

Medical laboratory technicians may perform the following tasks: set up equipment used in the laboratory and maintain it in a clean condition; prepare and stain slides of micro-organisms for microscopic examination; collect blood samples, perform blood counts, and perform tests to determine bleeding, coagulation time, blood types and other characteristics and communicate results of tests to the medical officers who have requested them.

5.1.2 Pathologists

Pathologist are specialist medical practitioners who use laboratory procedures to identify and diagnose the presence and stages of diseases and possible sources of infection in body tissues, fluids, secretions and other specimens.

(Commonwealth Department of Education, Science and Training 2002)

6 Workforce supply

6.1 Current supply of medical scientists

6.1.1 Profile of the current DHHS medical scientist workforce

6.1.1.1 Human Resource Services Information System data

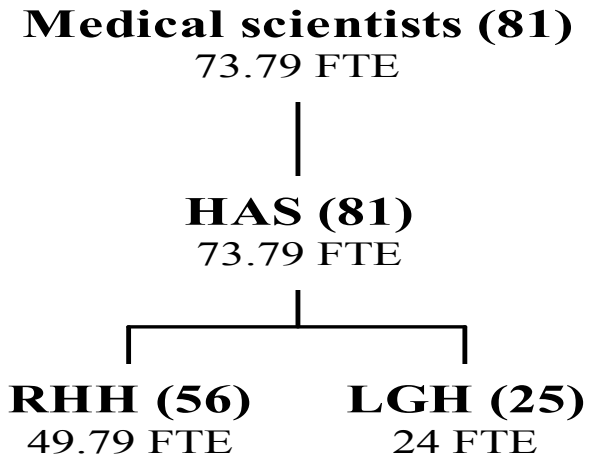
Data on the DHHS medical scientist workforce from the DHHS Human Resource Services Information System (as at 21 March 2002) has been displayed graphically. The information displayed in these graphs represents all medical scientist positions within DHHS regardless of whether these were filled or vacant at the time of this analysis.

Figure 1 displays the service structure of the 81 medical scientists employed in 73.79 FTE positions across the DHHS. It required 1.1 medical scientists to fill one FTE position indicating a low number of part-time staff or positions.

In the north west region, there were no medical scientists employed directly through the DHHS. Publicly funded pathology services in this region are provided through a contract between the DHHS and a private pathology service.

There were two FTE scientist (not medical scientists) positions in the Public and Environmental Health Services in the Community, Population and Rural Health Division of DHHS. These positions were not included in the analysis.

Figure 1: Division and service structure of medical scientists employed within DHHS (headcount in brackets)

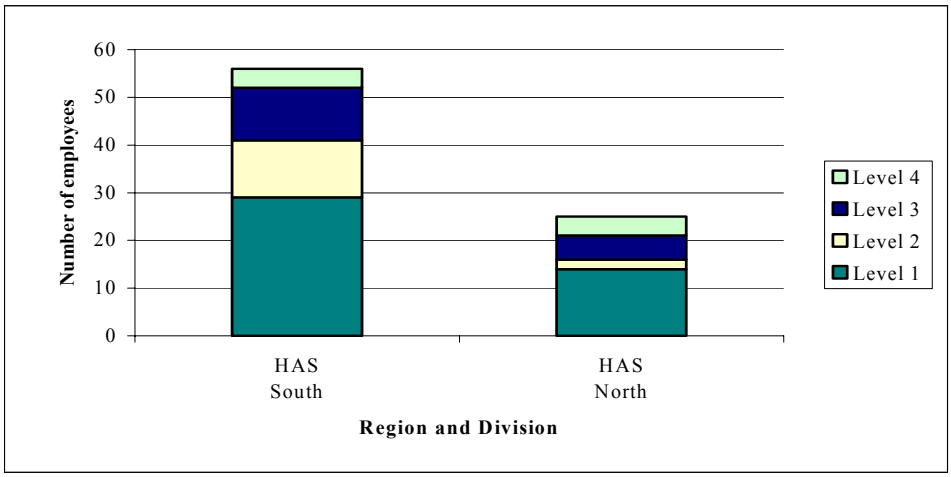


Source: DHHS Human Resource Services Information System 21 March 2002 (filled and vacant positions)

Since 21 March 2002, two of the four PF4 positions at the Launceston General Hospital have been reclassified to PF3 positions, but the following graphs do not take this into account.

Figure 2 displays the distribution of 81 medical scientists and their award classification across the Hospitals and Ambulance Service Division. The DHHS pathology service in the north west is provided through a contract with the private sector.

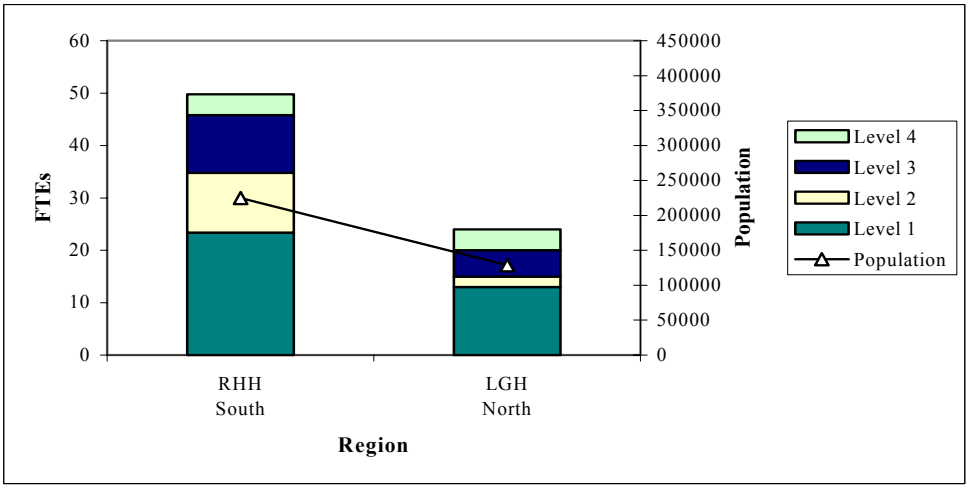
Figure 2: Medical science headcount per award classification across HAS



Source: DHHS Human Resource Services Information System 21 March 2002

Figure 3 displays the distribution of the 73.79 FTE positions of the HAS medical scientist workforce across the two regions of Tasmania. Medical scientists at the Royal Hobart Hospital undertake state-wide work, as described in 6.1.3.

Figure 3: Medical science FTEs per award classification in the HAS compared to regional populations in 2001



Source: DHHS Human Resource Services Information System 21 March 2002 (filled and vacant positions) and ABS census 2001

Table 1 shows the numbers of DHHS medical scientists at the various award levels.

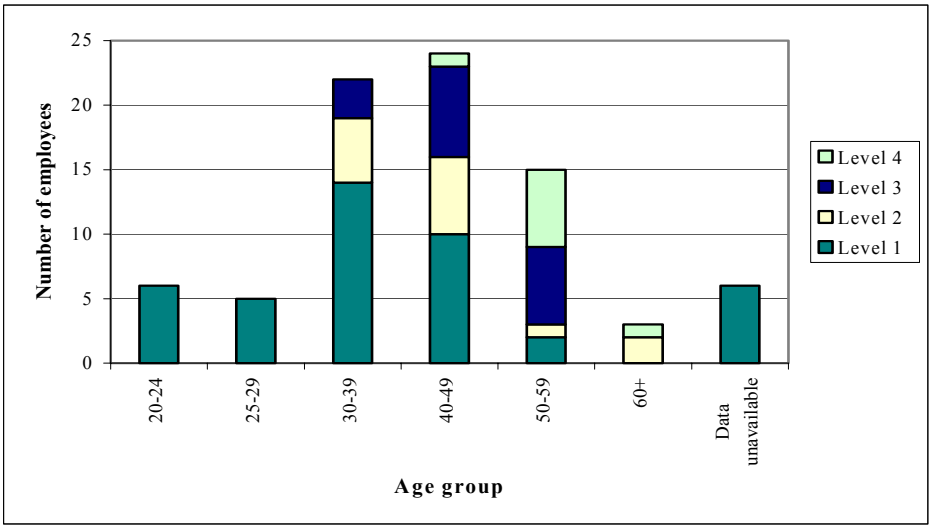
Table 1: Breakdown of the numbers of DHHS medical scientist FTE positions at specific award levels

Award levels	PF1	PF2	PF3	PF4	DHHS total
FTE medical scientist positions	36.39 FTEs	13.40 FTEs	16.0 FTEs	8.00 * FTEs	73.79 FTEs

Source: DHHS Human Resource Services Information System 21 March 2002 (filled and vacant positions)
** Since 21 March 2002, two of the four PF4 positions at the Launceston General Hospital have been reclassified to PF3 positions.*

Figure 4 displays the age group and award distribution of the DHHS medical scientist workforce. The average age of the DHHS medical scientist workforce was 41.4 years. This was slightly higher than the average age of all allied health professionals employed by DHHS, which was 40.3 years. The median age of the DHHS medical scientist workforce was 42 years. This matched the median age of all allied health professionals employed by DHHS, which was 42 years.

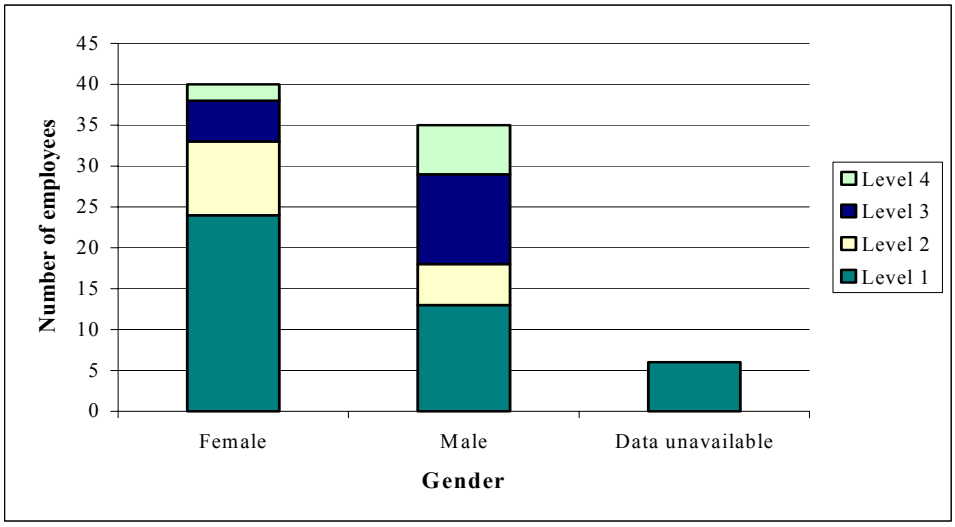
Figure 4: Medical science workforce per age group and award classification



Source: DHHS Human Resource Services Information System 21 March 2002 (filled and vacant positions)

Figure 5 shows the gender mix and the award distribution of the DHHS medical scientist workforce. There were 40 females and 35 males employed. Females comprised 53 per cent of the DHHS medical scientist workforce.

Figure 5: Medical science workforce per gender and award classification



Source: DHHS Human Resource Services Information System 21 March 2002 (filled and vacant positions)

6.1.1.2 DHHS staff survey data

Of the 81 medical scientists employed by the DHHS, 38 completed a survey form; resulting in a 47 per cent response rate. Due to the low response rate, only responses to some of the questions, that were supported by information from other consultations was used later in the report.

6.1.1.3 AIHW data

The AIHW report of 2001, stated that in 1996 there were 182 people employed as medical scientists in Tasmania. This included medical scientists employed in the public and private sectors.

6.1.2 Vacancies in the DHHS medical scientist workforce

There were no medical scientist vacancies of at least six months duration identified in 2001.

6.1.3 Types of work and client groups

Medical scientist respondents to the DHHS staff survey indicated that they were employed as clinicians, clinician managers, managers, researchers and project officers.

Medical scientists employed in the Royal Hobart Hospital and the Launceston General Hospitals provide core pathology services. In addition, medical scientists in the Royal Hobart Hospital undertake all tertiary referral work in the state, e.g. immunohistochemistry, cytogenetics, molecular medicine, flow cytometry, stem cell transplant preparation, virology, infectious diseases and endocrinology.

The project did not collect information that could be used to exactly describe the client groups serviced.

6.1.4 The education of DHHS medical scientists

6.1.4.1 University of Tasmania

The School of Human Life Sciences within the University of Tasmania Faculty of Health Science offers a three and a half year full-time Bachelor of Biomedical Science degree at the campus in Launceston. Graduates from the course meet the academic requirements for direct entry into the profession of medical science and the Australian Institute of Medical Scientists (AIMS).

Generally there are 24 new students enrolled in the course each year and upon graduation between six and twelve students obtain employment in Tasmania

Local representatives of AIMS stated that the course has a very good reputation across Australia and many students are offered employment in other states upon graduation.

There are no postgraduate courses offered for medical scientists in Tasmania.

6.1.4.2 Medical science schools in other states of Australia

Three and four-year medical science courses are offered through universities in all states of Australia. Graduates may hold the following qualifications: a Bachelor of Applied Science (Medical Science) or (Medical Laboratory Science) or (Biomedical Science); a Bachelor of Biomedical Science (Medical Science) or (Pathology) or a Postgraduate Diploma in Medical Laboratory Science.

Postgraduate qualifications may be obtained through the interstate universities that offer undergraduate medical scientist qualifications.

6.1.4.3 Re-entry into the profession

There are no formal requirements for a medical scientist to undertake when re-entering the profession after a period of absence. The technology used by medical scientists changes rapidly but there is usually the ability to upgrade skills on-the-job.

6.1.4.4 Postgraduate qualifications of DHHS medical scientists

Some medical scientist respondents to the DHHS staff survey stated that they had postgraduate qualifications and these included:

- graduate diploma level qualifications in computing, food science, management and human nutrition
- masters level qualifications in management and science
- and doctorate level qualifications in their medical science speciality.

A number of medical scientists have fellowship qualifications through the AIMS. These equate to PhD qualifications and can be gained by thesis or examination.

Very few medical scientists received funding from the DHHS to assist with their postgraduate study.

6.1.4.5 DHHS medical scientists born outside Australia

Some medical scientist respondents to the DHHS staff survey indicated that they were born overseas. The majority were born in UK/Ireland, however this information could not be used to indicate where these medical scientists were educated.

6.2 Projecting the workforce supply of medical scientists

Workforce supply is a balance between outgoing staff (retirees, those temporarily withdrawing from the workforce, emigrants or those who die or take up employment with other employers) and incoming staff (new graduates, immigrants, staff coming from other employment and staff increasing their hours of employment).

6.2.1 Outgoing DHHS medical scientists

In the years 2000 and 2001, there was an average of 6.5 permanent, temporary and casual medical scientists who left the DHHS per year.

Applying this average to the 21 March 2002 headcount, approximately 8 per cent of the DHHS medical scientist workforce left per year. This average turnover rate was considered to be low, when compared to other allied health professions, in those two years.

In order to ascertain the possible future numbers of outgoing medical scientists, staff were asked a number of questions in the DHHS staff survey. Staff were asked:

- if the hours they worked were the hours they wanted to work
- if they anticipated a change in their work hours in the next three years and the reasons for this change
- if they were considering leaving the DHHS in the next six to twelve months, and if so, what were the reasons
- what were their levels of satisfaction for a number of professional practice parameters in the DHHS.

A number of medical scientists who indicated they were not working the hours they wanted to work, stated that they were doing a number of unpaid hours (ranging from one to twelve hours per week); some wanted to upgrade their employment hours from part-time to full-time and some wanted to reduce their number of employment hours to part-time.

Nine of the 38 medical scientist respondents (24 per cent) to the DHHS staff survey indicated that they anticipated an increase in their work hours in the next three years and cited as the reasons: 'changed patient numbers' (four respondents), 'family considerations' (one respondent), 'study commitments' (one respondent) and 'workplace change' (one respondent).

Four of the 38 medical scientist respondents (11 per cent) to the DHHS staff survey indicated that they anticipated an decrease in their work hours

in the next three years and cited as the reasons: 'family considerations' (two respondents), 'developments in medical technology' (one respondent), and 'lifestyle preference' (one respondent).

Seven of the 38 medical scientist respondents (18 per cent) indicated that they were considering leaving in the next six to twelve months and the reasons stated were mixed: 'promotion', 'retirement', 'other employment', 'contract ends' and 'travel'. This is a low rate of staff intending to leave, compared to the overall average allied health professional rate of 25 per cent.

Table 2 provides information on the medical scientists' responses on levels of satisfaction with the various professional practice parameters.

Table 2: Staff satisfaction with professional practice parameters in DHHS

Criteria measured	Per cent of respondents who were satisfied or very satisfied
Opportunity to use your abilities	63 %
Sufficient work to maintain competence	71 %
Hours of work	58 %
Amount of work	47 %
Overall satisfaction with practice	50 %

Source: DHHS staff survey October 2001

The rate of overall satisfaction with practice was low compared to the response rates of other allied health professions. A further breakdown of responses to this question is displayed in Table 3.

Table 3: Breakdown of responses to 'overall satisfaction with your practice' question on the DHHS staff survey

Taking everything into consideration, how satisfied are you with your practice	Per cent of respondents who were satisfied or very satisfied
Very dissatisfied	0%
Dissatisfied	11 %
Neither dissatisfied or satisfied	29 %
Satisfied	45 %
Very satisfied	5 %
Data unavailable	11 %
TOTAL	100 %

Source: DHHS staff survey October 2001

In the section in the DHHS staff survey following questions about satisfaction with practice, staff were asked to specify other issues of importance. The medical scientist comments to this section were around issues such as the need for more time for CPD activities, low staff to workload ratios, the lack of recognition of postgraduate qualifications and salary parity with other states.

Other information that was relevant to outgoing staff was that in the DHHS workforce there were:

- four medical scientists of 55 to 59 years of age

- and three medical scientists of 60 years and older.

6.2.2 Incoming DHHS medical scientists

In the years 2000 and 2001, there were 8.5 full time, temporary and casual medical science positions advertised per year. It is not known if these advertisements were successful. The positions were:

- 10 x PF1 level positions (59 per cent)
- 5 x PF2 level positions (29 per cent)
- 1 x PF3 level position (6 per cent)
- 4 x PF4 level positions (6 per cent).

There will be approximately 24 potential new graduate employees from the University of Tasmania School of Human Life Sciences in 2002.

7 Workforce demand

7.1 Current demand for medical scientists

7.1.1 Perceived medical scientist service gaps

There was an identified service gap in Tasmania for medical scientists who specialise in the areas of cytogenetics and cytology. Staff in these areas provide testing for genetic screening of pre-term infants, infants and adults and genetic typing of diseases.

7.1.2 Patterns of usage

7.1.2.1 Profession to population ratios

The AIHW report of 2001 stated that in 1996, the ratio of medical scientists was 39.2 per 100,000 of the Tasmanian population. The national average of medical scientists was 53.8 per 100,000 population. These figures included medical scientists employed in the public and private sectors.

The lower ratio of medical scientists per population may be explained by the facts that:

- a number of specialised tests are carried out in mainland centres
- there are many different staffing organisations and ratios in pathology laboratories across Australia.

7.1.2.2 Staff workload assessments

The DHHS staff survey asked medical scientists if they considered their current workload was about right, too much or too little. Of the 38 medical scientist respondents:

- 17 (45 per cent) stated that their workload was about right
- 19 (50 per cent) stated that their workload was too much.

7.2 Projecting future demand for medical scientists

7.2.1 National demand for medical scientists

Information from the JobSearch web site of the Commonwealth Department of Employment and Workplace Relations (2002) states the work prospects for medical scientists are good.

"Employment growth for medical scientists to 2007-08 is expected to be strong. Employment in this large occupation (16,400 in February 2002) rose strongly in the past ten years, and slightly in the past five years.

Medical scientists have an average proportion of full-time jobs (72 per cent) and earnings are above average - in the eighth decile. Unemployment for medical scientists is low.

Medical scientists are employed mainly in hospitals and nursing homes, other health services, scientific research, post-school education and medical and dental services. The mix of industries employing Medical Scientists is favourable for employment growth prospects.

Job turnover for medical scientists is moderate. Vacancies arising from job changing (medical scientists changing employers) are expected to provide 60 per cent of vacancies, compared with 28 per cent from job openings (medical scientists leaving the occupation) and 12 per cent from new jobs (employment growth for medical scientists)".

7.2.2 Perceived drivers for the services of DHHS medical scientists

No information was obtained on the national drivers for medical scientists, however, the DHHS staff survey asked medical scientists what they perceived the drivers for their workforce to be.

The majority of medical scientist respondents to the DHHS staff survey perceived that the factors likely to increase the future size of the medical scientist workforce were:

- ageing of the population
- changing patterns of health and illness
- patient expectations/knowledge
- requirements for safer procedural practice
- growth in consumer demand.

8 Workforce planning issues identified through consultations

8.1 Staff workloads in DHHS

Although the project did not collect specific information on the workloads of medical scientists, it appeared through the consultation processes that increasing workloads for medical scientists was an issue.

8.2 Impact of technology

Tasmanian representatives of AIMS reported that the introduction of 'black box' technologies has resulted in the de-skilling of medical scientists, although this may be offset to a certain degree by the growth of DNA technologies. These latter technologies are also becoming automated, and in the future, may also not require great skill or hands-on work. The Association stated that there is a growing trend in the United States of America, due to the shortage of medical scientists, to train other health workers to undertake limited testing functions. In this situation, there is a challenge to maintain quality results and this may be the future role for medical scientists.

There has been an increased use by doctors of new diagnostic technologies in other areas of the health industry, e.g. medical imaging and this is impacting on the use of pathology services.

8.3 Multi-skilling

The impact of the introduction of 'core' laboratory approaches to processing work has increased the need for multi-skilled medical scientists. Representatives of AIMS stated that greater employment opportunities are possible for those who are cross-trained, however the decreased staffing levels that accompany the implementation of multi-skilling has caused an increase in staff stress. The loss of specialist skills may effect advancement opportunities.

8.4 Opportunities for career progression within DHHS

Representatives of the AIMS stated that the flattening of organisational structures and changes to laboratory operations have resulted in a proliferation of PF1 positions at the expense of supervisory and specialist positions.

The representatives also stated that rostering new graduates into shiftwork positions hastened their exit from the state. Tasmanian medical scientists then do not return to the state as there are few positions for experienced staff.

Another effect of restructuring has been the loss of staff with specialist expertise, who in the past, were a mentoring source of information for less experienced staff. Now without the pool of expertise, less experienced staff experienced higher levels of work stress.

8.5 Shiftwork

The provision of a twenty four hour service has affected the lifestyle opportunities for DHHS staff. Representatives of AIMS said that the change away from regular work patterns may be attractive to some staff for a limited number of years, but that the documented effects of shiftwork, e.g. reduced life expectancy, increased stress and family break-up were a long term problem.

Newly graduated medical scientists need to gain specific levels of competencies prior to undertaking shift work. This skill building keeps new graduates out of the roster pool until competencies are achieved and other more experienced staff have to cover the work.

8.6 Remuneration

Representatives of the AIMS, which has 80 per cent of Tasmanian medical scientists as members, stated that there were significant differences in interstate rates of pay.

The Victorian rates of pay were the highest and this made attraction of medical scientists to positions in DHHS difficult, unless the individual found the Tasmanian lifestyle was attractive.

8.7 Rationalisation of tests

Pathology services are required to maintain a broad range of staff skills and equipment due to the wide range of diagnostic tests that maybe ordered. Many of these tests are outdated. Rationalisation of the tests provided by DHHS pathology services would improve efficiencies.

8.8 Satisfaction with DHHS employment

Information on staff satisfaction with DHHS employment was obtained through focus groups. A total of 12 medical scientists from the south and north attended the DHHS focus groups. A summary of the information obtained is in Table 4.

Table 4: Summary of information obtained from medical scientists at the DHHS focus groups

Positive attributes of employment in DHHS	Aspirations	Negative attributes of employment in DHHS	Constraints
• Interesting work • Team work	• Recognition of post graduate qualifications • Back-up and support for workload management and CPD	• Range of issues, no significant trends across all respondents	• Budget
Regional variations • Variety of work is a strong source of satisfaction in Hobart. • Staff from Launceston had concerns about losing the range of work to the south.			

Source: DHHS focus group December 2001

8.9 Employment opportunities in the private sector

The public sector employs approximately 65 per cent of the Tasmanian medical scientist workforce. More medical scientist technicians are employed per medical scientist in the private sector.

The public sector offers more variety in workloads and the opportunity to interact with a wider organisation, however, there is an occasional

movement of senior medical scientist staff to the private sector in Tasmania.

8.10 Professional development to retain and strengthen a quality workforce

8.10.1 Australian Institute of Medical Scientists

There are a number of other professional organisations to which medical scientists can belong, i.e. the Australian Society of Microbiologists, the Australian Association of Clinical Biochemists, the Australian Haematological Society of Australia, the Australian Society of Cytologists, the Australian Society of Cytogenetists. The latter two organisations have mandatory professional development for membership and provide such activities for members (AIMS 2002).

Consultations with local representatives of AIMS provided the information that there were few opportunities for medical scientists to undertake CPD within work time, mostly due to high staff workloads.

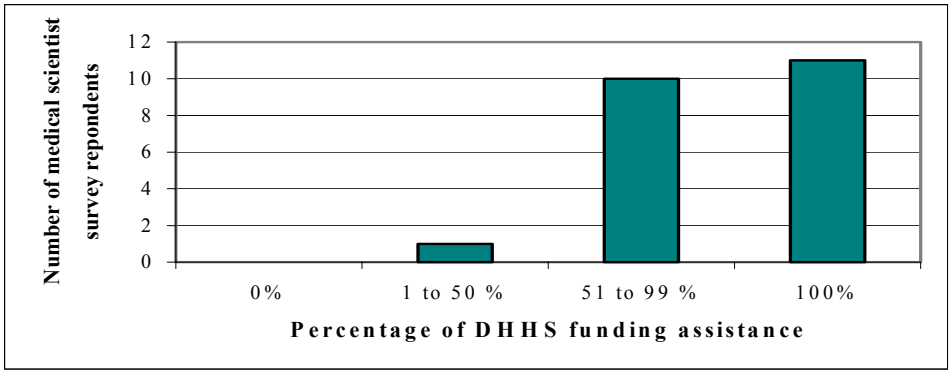
8.10.2 DHHS staff survey

The DHHS staff survey asked medical scientists questions about CPD. There were no patterns to the responses in the area of CPD. Some staff said they were offered regular CPD though their employment, some staff from the same services said that they were not offered regular CPD, and this did not seem to depend on the full time or part time nature of the staff member's employment or the place of employment.

Twenty five of the 38 medical scientists respondents to the DHHS staff survey, (n=81), said that they had applied to attend a conference in the last two years and 22 staff said that they were offered support to attend. The proportion of funding received varied from 50 to 100 per cent.

Figure 6 shows the distribution of the percentage of financial assistance the 22 successful medical scientist survey respondents received from DHHS to attend conferences in the last two years.

Figure 6: **The distribution of the percentage of financial assistance successful medical scientist survey respondents received from DHHS to attend conferences in the last two years**



Source: DHHS staff survey October 2001

8.10.3 University of Tasmania education of medical scientists

Representatives of the AIMS stated that the current medical scientist course offered through the School of Human Life Sciences attracts a high calibre of student, but because of the limited number of positions in the public and private sectors in Tasmania, a significant number of graduates are lost permanently to the Tasmanian medical scientist workforce.

Representatives also stated that it was essential for a course to continue to be provided in Tasmania to ensure an adequate supply of medical scientists and that it may have to encompass new areas, e.g. genetic testing rather than traditional science subjects.

9 Annotated bibliography

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