

**OCCUPATIONAL TRENDS
IN NEW ZEALAND:
1991-2001**

BY THE DEPARTMENT OF LABOUR

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INTRODUCTION

The following is a research paper completed by the Department of Labour on occupational trends in New Zealand between 1991 and 2001. The current provision and co-ordination of information on the demand for and availability of skills in New Zealand is very high level, patchy and poorly co-ordinated. To improve the future matching of people's skills to jobs will require better information on future job prospects. Analysis of historical trends can contribute to this. Such information could also aid students, prospective students, potential new and return migrants, employers and providers to make informed employment, training and migration decisions. These groups will need information on the potential returns to investment in particular skill acquisition, the potential for training and development, and the "security" of potential jobs. One way of providing this kind of information is to perform quantitative forecasts of occupational trends. There are a range of occupational forecasting methods that can be used, however many of these methods are resource intensive and some uncertainty exists about their usefulness and accuracy.

This research paper is part of the Skills Information Action Plan and the Future of Work programme in the Department of Labour. The *Skills Information Action Plan* was developed to respond to perceived skill shortages in New Zealand by improving the quality of information available to decision-makers regarding current and future demand and supply of skills. The *Future of Work* programme proposes to gather, produce and disseminate non-partisan information, which will enable people involved in the world of work (unions, employers, employees, self-employed, policymakers, educators) to plan better for the future.

The current research paper begins with a description of the New Zealand Standard Classification of Occupations (NZSCO99). This is followed by descriptive analyses of trends in the occupational structure of the New Zealand labour market between 1991 and 2001 using Census data. This section comprises of key explanatory figures and charts of longitudinal trends.

Later Information Releases

This research paper is part of ongoing work in the Department of Labour. Further information releases on occupational trends are scheduled for late August/September 2002. There is ongoing work on the following areas:

- An analysis of the conceptual basis of occupational classifications used in New Zealand. This is done because the classification system forms the basis of the quality and amount of occupational employment information that can be used for historical trends. The NZSCO99 is described in detail and its usefulness is assessed. NZSCO99 is a skills-based classification system therefore the paper examines the strengths and limitations of the way that the NZSCO99 uses skills information. Cognisant of some of the identified limitations of the NZSCO99's use of skills, the paper then explores some alternative ways of incorporating skill concepts into occupational classifications.
- Descriptive analyses of occupations by Gender, Ethnicity and Age from Census' in 1991, 1996 and 2001.
- Detailed Industry analyses from Census' in 1991, 1996 and 2001.

- More detailed conceptual analyses of the trends driving growth in the following occupational groups:
 - Information Technology;
 - Management; and
 - Service and Sales.

- An evaluation of the usefulness and feasibility of making comparisons with international occupational data. In this section, the International Standard Classification of Occupations is discussed in terms of which countries currently use it and how feasible comparisons between these countries are. This is followed by an examination of the similarities and differences between the NZSCO99 and the occupational classification system used in Australia.

The Role of Occupational Classifications

Occupational classifications categorise the type of work that is performed in a job. They are used to collect, organise, analyse and disseminate empirical data on occupations from statistical surveys such as censuses and labour force surveys, and administrative sources. The nature of occupational information obtained for classification purposes is strongly influenced by the nature and social setting of the questions, enquires or data sources used to provide such information (Elias, 1997). The decisions underlying the collection of data on occupations also influence the nature of the occupational classification system itself.

One of the dilemmas of developing occupational classifications is the rapid nature of occupational change. To accurately reflect current labour market conditions, it is important that occupational classifications are kept up to date by national statistics departments and employment bureau. However, it is also important to build a sufficiently robust classification system that allows for long-term use and facilitates meaningful time series analysis of occupational data. Consequently, too much change between different versions of an occupational classification system is undesirable.

The majority of occupational classifications aim to classify jobs according to the nature of the work being performed by the worker rather than the characteristics of the worker (Elias, 1997). Occupational groupings are differentiated from each other according to the responsibilities, tasks and required training and/or experience that are common to that group.

Occupational information serves a variety of purposes depending on the user. The current research paper focuses primarily on the following user groups: employment agencies, people entering or presently in the labour market; and labour market researchers and policy advisers.

Employment agencies use occupational information to assist them in their recruitment and job matching functions. This group requires more detailed information on occupational changes. Similarly, *new entrants to the labour market* use occupation information to make career decisions therefore the greater the amount of detail the better. For example, new labour market entrant may assess how the industries, skills, wages are associated with particular occupations, alternatively they may examine which occupations employ people with particular skills. *People currently in the labour market* may be interested in occupational

information to help them in making decisions on how to progress their current career or for generating possible options for changing their occupations.

Labour market researchers and *policy advisers* are interested particularly in occupational trends and the drivers of these trends in the context of the labour market. This information can provide guidance on skill shortages, future training and educational demands and employment opportunities. Occupational research can also facilitate policy discussion about issues such as immigration, unemployment insurance, and equal employment opportunities.

SECTION 1: WHAT IS THE NEW ZEALAND STANDARD CLASSIFICATION OF OCCUPATIONS?

The following section describes the most recent version of the New Zealand Standard Classification of Occupations (NZSCO99).

Recent changes to the NZSCO

The NZSCO was established as the national framework for reporting on occupations in New Zealand in 1968. It was based on the International Standard Classification of Occupations (ISCO-88; discussed in greater depth in *Section 3: The Feasibility of Making International Comparisons of Occupational Information*). The NZSCO is regularly reviewed to respond to changes in the labour market. There has been only one major review of the NZSCO recently in 1990. In this review, it was decided that NZSCO90 would adopt the ISCO-88 classifications to maintain time-series continuity and to improve its international comparability. Smaller and less substantial reviews of the NZSCO have been conducted in 1995 and 1999.

The 1999 version of the NZSCO (NZSCO99) continues to use the major groups of previous versions of the NZSCO. The main changes for the NZSCO99 occurred at the unit group or occupational level only:

- Occupations with 100 or fewer responses in the 1996 census were removed;
- The thirty largest occupations in the 1996 census were assessed to identify any new occupations; and,
- Minor changes were also made to occupation titles, job content and to improving skills information.

The conceptual basis of the NZSCO99

NZSCO99 is a skills based classification. The definitions of job, occupation and skills used in NZSCO99 are the same as those used in the ISCO-88. Occupations in the NZSCO99 are *described*, including *outlines of the tasks and duties* involved and provide details of the *training and experience required*. NZSCO99 uses the following two definitions for determining what is an occupation and what is a job:

An *occupation* is a set of jobs, which involve the performance of a common set of tasks. Whereas, a *job* is a set of tasks performed or designed to be performed by one individual. Jobs usually have a specific title and a person may require or have any of the following attributes to enable them to perform their job(s):

- Formal qualifications;

- Competencies;
- Experience;
- Subject matter knowledge;
- Ability to use specific tools and equipment; and/or
- Ability to produce specific good and/or services.

Skills in the NZSCO99 are defined according to ‘skill level’ and ‘skill specialisation’. These two kinds of skills are used to classify occupations within the hierarchical NZSCO99 structure. Occupations are assigned in the NZSCO99 to the highest level, known as ‘major groups’, based on their required skill level, whereas they are assigned to lower levels known as ‘sub-major’ and ‘minor groups’ based on progressively finer interpretations of skill specialisation.

The *skill level* of an occupation is defined as a function of the complexity and range of tasks involved. This is used to determine which major group an occupation belongs to. Skill level is operationalised as the amount of education (or training) and work experience needed to perform the given tasks and duties competently. The NZSCO99 has four skill levels:

- University degree;
- New Zealand Certificate or other advanced vocational qualification;
- Experience – observation, practical acquaintance with facts or events;
- On-the-job training – learning of tasks and how to do a job.

Skill level is an attribute of *the occupation*, not necessarily of the individual who holds that occupation. For example, the occupation ‘plumber’ is classified according to the amount of formal education and previous experience that is usually required for an individual to gain entry to that occupation. The classification is not based on whether a particular individual working as a plumber has that amount of formal education, training or previous experience. Skill level also does not indicate how ‘well’ an occupation is performed. For example, the classification of a plumber does not consider whether the individual is an extremely competent, average, or poor plumber.

Skill specialisation is defined as a function of the field of knowledge required to perform the tasks, the tools and equipment used, the materials worked with and goods and services produced. Skill specialisation is used to differentiate between occupations that are grouped under the same skill level. It allows the major groups to be sub-divided into sub-major groups, minor groups and unit groups.

The hierarchical structure of NZSCO99

The NZSCO99 is a five-level hierarchically structured classification. At its highest level, the structure of NZSCO99 is designed around nine major groups. Each major group has its own characteristics that distinguish it from the other major groups (in terms of education qualifications, levels of responsibility, skill types, etc). Major Groups are loosely organised in the NZSCO99 from highly skilled (Major Group 1) to less skilled (Major Group 9). Each major group can be further subdivided into four other levels of sub-major group, minor group, unit group and occupations (see Table 1 below).

Table 1. NZSCO99 Classification Structure

| Major Group | Sub-Major Groups | Minor Group | Unit Groups | Occupations |
|--|-------------------------|--------------------|--------------------|--------------------|
| 1 Legislators, Administrators and Managers | 2 | 6 | 14 | 34 |
| 2 Professionals | 4 | 17 | 46 | 99 |
| 3 Technicians and Associate Professionals | 3 | 16 | 54 | 119 |
| 4 Clerks | 2 | 6 | 18 | 34 |
| 5 Service and Sales Workers | 2 | 8 | 17 | 36 |
| 6 Agriculture and Fishery Workers | 1 | 4 | 14 | 35 |
| 7 Trades Workers | 4 | 14 | 31 | 64 |
| 8 Plant and Machine Operators and Assemblers | 4 | 20 | 58 | 127 |
| 9 Elementary Workers (incl. Residuals) | 3 | 8 | 8 | 17 |
| Total | 25 | 99 | 260 | 565 |

Note. Taken from Statistics New Zealand (1999), p. 12.

Table 2 provides an example of an occupation classified in the five levels of the NZSCO99. As can be seen in the table, the lower the level of the classification in the NZSCO99, the greater the level of detail included about that occupation.

Table 2. Five Level Hierarchical Structure for Immigration Officer

| |
|---|
| 1 Major Group 3 Technicians and Associate Professionals |
| 2 Sub-Major Group 33 Other Associate Professionals |
| 3 Minor Group 333 Government Associate Professionals |
| 4 Unit Group 3331 Customs and Border Inspectors |
| 5 Occupation Group 33313 Immigration Officer |

SECTION 2: OCCUPATIONAL TRENDS IN NEW ZEALAND'S LABOUR MARKET BETWEEN 1991-2001

Introduction

The following section provides an occupational profile of the New Zealand labour market between 1991 and 2001. It begins with an occupational breakdown of employment in 2001, specifying the largest occupations that existed at the time. Changing occupational employment between 1991 and 2001 is then examined, separating out the occupations that contributed most to changes in employment between these years. The quantitative data is derived from 2001, 1996 and 1991 census responses.

An Occupational Profile of the 2001 New Zealand Labour Market

In 2001, total employment stood at 1.727 million. Table 3 below shows a breakdown of this total employment figure into the nine major occupational groups – this is the highest possible level of aggregation of the 562 occupations¹ that were developed within the NZSCO99.

Table 3. Occupational Employment by Major Group in 2001

| Major Group | Employment | Share of total employment % |
|------------------------------------|------------------|-----------------------------|
| 5 Sales & Service Workers | 242,496 | 14.0 |
| 2 Professionals | 239,616 | 13.9 |
| 1 Legislators/Admin/Managers | 216,471 | 12.5 |
| 4 Clerks | 216,372 | 12.5 |
| 3 Technicians & Ass. Prof. | 190,689 | 11.0 |
| 7 Trades Workers | 145,284 | 8.4 |
| 8 Plant/Machine Operator/Assembler | 144,018 | 8.3 |
| 6 Agriculture/Fishery Worker | 137,499 | 8.0 |
| 9 Elementary Workers | 100,647 | 5.8 |
| Total | 1,727,289 | 100.0 |

Interpreting this data:

- The two biggest occupational groupings were Service & Sales Workers and Professionals each containing approximately 240,000 people, or 14% of total employment.
- Clerks and Legislators, Administrators & Managers were of a similar size to each other but were approximately 25,000 less than the largest groups.
- Between Technicians & Associate Professionals and Trades workers there was a wide gap of approximately 46,000 people.
- Elementary workers were also significantly smaller than the next largest group.

¹ The question about occupation in the 2001 census prompted 94 thousand responses (5% off all responses) that were either 'not identifiable', 'outside the scope of the Standard Classification Structure' or 'not stated'. These are omitted from table 3 and referred to as non-applicable in the rest of this section.

The Largest Occupations

Table 4 lists the twenty largest occupations in the 2001 census - these twenty accounted for 33% of all employment in 2001.

Table 4. Twenty Largest Occupations in 2001

| Occupation Title | Employment | Share of total employment % |
|--|------------------|-----------------------------|
| Sales Assistant | 85,530 | 5.0 |
| General Clerk | 55,311 | 3.2 |
| General Manager | 43,077 | 2.5 |
| Cleaner | 32,724 | 1.9 |
| Retail Manager | 29,121 | 1.7 |
| Primary School Teacher | 27,522 | 1.6 |
| Secretary | 26,484 | 1.5 |
| Dairy Farmer, Dairy Farm Worker | 26,331 | 1.5 |
| Crop and Livestock Farmer, Worker | 25,920 | 1.5 |
| Registered Nurse | 25,272 | 1.5 |
| Information Clerk and Other Receptionist | 22,761 | 1.3 |
| Heavy Truck or Tanker Driver | 22,686 | 1.3 |
| Care Giver | 22,629 | 1.3 |
| Administration Manager | 21,999 | 1.3 |
| General Labourer | 21,048 | 1.2 |
| Secondary School Teacher | 18,528 | 1.1 |
| Accountant | 18,396 | 1.1 |
| Builder (Including Contractor) | 17,784 | 1.0 |
| Accounts Clerk | 16,689 | 1.0 |
| Technical Representative | 16,290 | 0.9 |
| Total employment for top twenty | 576,102 | 33.4 |
| Total employment | 1,727,289 | 100.0 |

A simple list of occupations like that given in the table provides an accessible and labour market profile. However, in order to provide further context, the following section will compare the largest occupations to other occupations that involve similar tasks, or require similar skills. The NZSCO99 structure allows this to be done because it provides five levels of aggregation, with occupations placed into increasingly larger groups under the criteria of similar tasks, skill levels and skill specialities.

Professionals

Four of the occupations in the top twenty largest occupations, fall into the second largest occupational group: Professionals. Together, Primary School Teachers, Secondary School Teachers, Registered Nurses and Accountants made up 37% of all professional employment in 2001.

- Primary School Teacher was the sixth largest occupation in 2001 and made up 36% of Teaching Professionals - see chart 1.
- Secondary School Teacher was the sixteenth largest occupation in 2001 and made up 24% of Teaching Professionals - see chart 1.
- Registered Nurse was the tenth largest occupation in 2001 and made up 49% of all Life Science and Health Professionals – see chart 1.
- Accountant was the seventeenth largest occupation in 2001 and made up 43% of Business

Professionals – see chart 1.

The following charts and inset tables provide further context. The first chart shows a breakdown of Professional employment and the accompanying table places the large teaching and nursing occupations alongside the other occupations grouped under the headings of Teaching, Health and Nursing & Midwifery Professionals. The second chart shows a similar disaggregation of Other Professionals and the accompanying table places Accountants alongside other occupations grouped under Business Professionals.

Chart 1. Professional Employment 2001

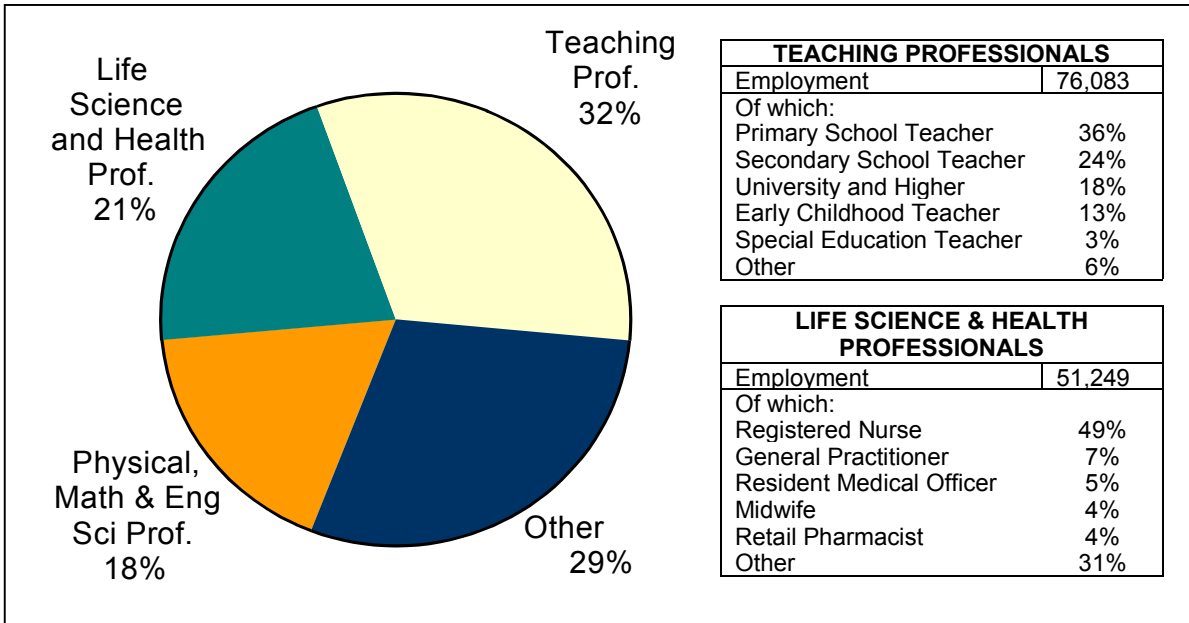
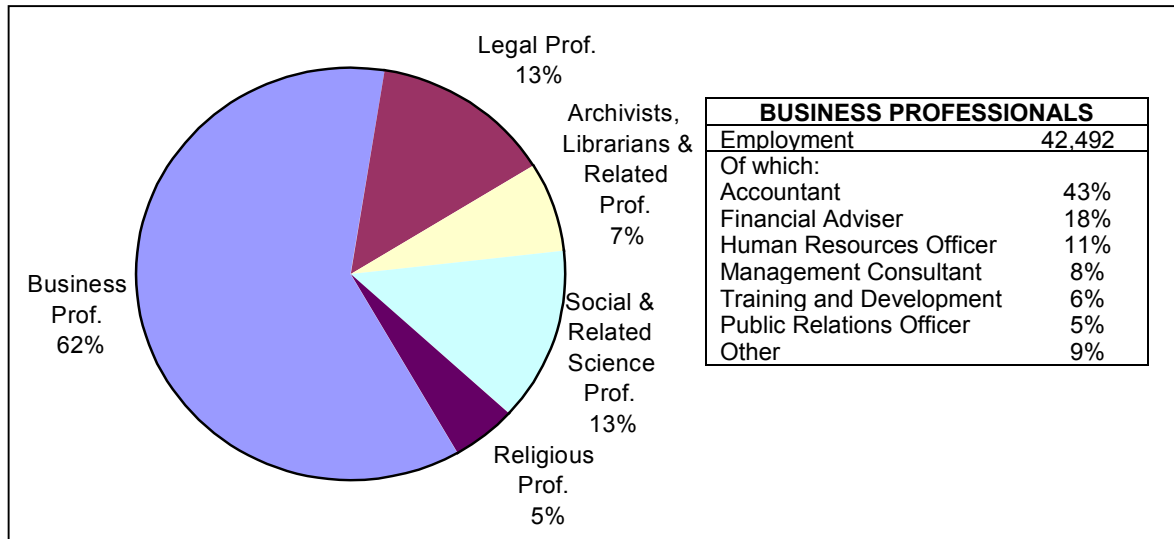


Chart 2. Other Professional Employment 2001



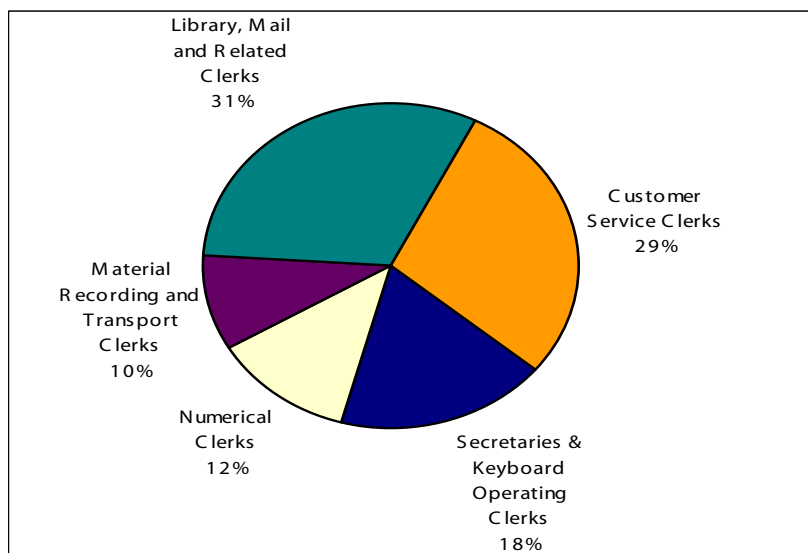
Clerks

Four of the largest occupations fall into another of the large occupational groups, Clerks. Together, General Clerks, Secretaries, Information Clerks & Other Receptionists and Accounts Clerks made up 56% of employment in the Clerk major group.

- General Clerk was the second largest occupation in 2001. They perform a variety of office based clerical tasks including preparing and sending correspondence, filing, record maintenance and account management. General Clerks numbered over 55,000 last year and made up 81% of Library, Mail and Related Clerks an occupational group that also includes Library Assistant, Mail Clerk and Human Resources Clerk.
- Secretary was the seventh largest occupation in 2001. They numbered over 26,000 last year and made up 67% of Secretaries and Keyboard Operating Clerks an occupational group that also includes Typist & Word Processor Operator and Data Entry Operator.
- Information Clerks & Other Receptionists was the eleventh largest occupation in 2001. Their job involves receiving people coming into an establishment, ascertaining their wants and directing them accordingly. They numbered over 16,000 last year and made up 37% of Customer Service Clerks an occupational group that also includes Checkout Operator, Bank Officer and Telephone Switchboard Operator.
- Accounts Clerk was the nineteenth largest occupation in 2001. They maintain records of one or more phases of an undertaking's financial transactions such as accounts receivable or accounts payable. Accounts Clerks numbered over 22,000 last year and made up 64% of Numerical Clerks an occupational grouping that includes Audit Clerk, Statistical Clerk and Survey Interviewer.

Secretaries & Keyboard Operating Clerks, Library, Mail and Related Clerks, Customer Service Clerks & Numerical Clerks and Material Recording & Transport Clerks, all make up a larger group of occupations entitled Office Clerks with Customer service Clerks completing the Clerk major group. The following chart provides a break down of the Clerk major group into these smaller occupational groupings.

Chart 3. Clerk Employment 2001



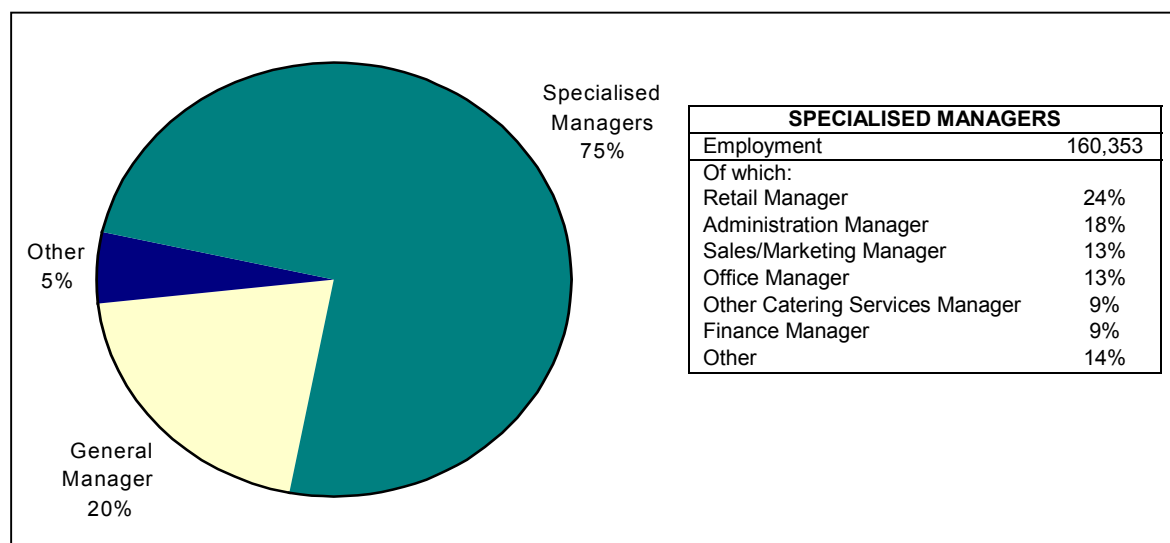
Managers

Three of the largest occupations are classed as managers. Together General Manager, Retail Manager and Administration Manager made up 44% of all employment in the major group of Legislators, Administrators and Managers in 2001.

- *General Manger* was the third largest occupation last year. They develop policy and plan, organise and control the major functions of an establishment (industrial, commercial, governmental or other) through departmental managers and executive subordinates. They made up 21% of *Corporate Managers* a group of over 200,000 people, which also includes *Specialist Managers*.
- *Retail Manager* was the fifth largest occupation last year. They plan and organise a retail business or a department within a branch in the retail trade and direct workers engaged in selling goods. They are the largest occupation within *Specialist Managers* and make up 14% of all *Corporate Managers*.
- *Administration Manager* was the fourteenth largest occupation last year. Their job involves planning, organising and co-ordinating, at senior management level, the internal administration practices of an undertaking (public, private industrial, commercial or other). They are the second largest occupation within *Specialist Managers* and made up 11% of all *Corporate Managers*.

The following chart and table provides more information. The chart disaggregates the major group of Legislators, Administrators & Managers into smaller occupations and occupational groups. This demonstrates the large number of General Managers relative to other types of managers. The accompanying table splits Specialised Managers in order to see Retail Manager and Administration Manager in the context of other occupations that are placed under the same heading in NZSCO99.

Chart 4. Legislators, Administrators & Managers Employment 2001



Other Large Occupations

- *Sales Assistant* was by far the largest occupation in 2001. It made up 35% of *Service and Sales Workers*, the largest major occupational group last year comprising over 242,000 people.
- *Cleaners* were the fourth largest occupation in 2001. It made up 33% of *Elementary workers*, the smallest major occupational group last year comprising just over 100,000 people.
- *Dairy Farm & Dairy Farm Workers* and *Crop & Livestock Farmer, Workers* together made up 38% of all *Agriculture and Fishery Workers*.

It is also interesting to note that the major group *Technicians & Associate Professionals*, one of the largest major groups last year, has only one occupation in the top twenty: *Technical Representatives*. They sell and advise customers on the application, installation and operation of specialised equipment (such as computers), supplies and services and make up 47% of *Sales Representatives*, a group that also includes *Sales* and *Business Services Representatives*.

Occupational Employment Growth in New Zealand Between 1991 and 2001

This section analyses changes in employment between 1991 and 2001, examining first the impact of these changes on the occupational structure of the labour market and then tracing back these occupational trends to large movements in a relatively small number of occupations.

Between 1991 and 2001 employment in New Zealand rose by approximately 327,000. Table 5 takes this rise and attributes it to each of the major groups.

Table 5. Occupational Composition of Employment Growth 1991 to 2001

| Major Group | 1991 – 1996 | 1996 – 2001 | 1991 – 2001 |
|---------------------------------------|----------------|---------------|----------------|
| 1 Legislators/Admin/Managers | 26,703 | 27,390 | 54,093 |
| 2 Professionals | 24,863 | 43,095 | 67,958 |
| 3 Ass. Professionals/Technicians | 25,667 | 18,138 | 43,805 |
| 4 Clerks | 15,738 | -3 | 15,735 |
| 5 Service/Sales Workers | 47,694 | 16,413 | 64,107 |
| 6 Agriculture/Fishery Workers | 16,236 | -16,092 | 144 |
| 7 Trades Workers | -366 | -3,090 | -3,456 |
| 8 Plant/Machine Operators/Assemblers | 3,825 | 7,851 | 11,676 |
| 9 Elementary Occupations | 11,511 | -10,638 | 873 |
| Overall net employment growth* | 230,281 | 96,525 | 326,806 |

*Including non-applicable

Table 5 broadly reveals when and where occupational growth occurred:

- In the early 1990s, Service and Sales workers were the main contributors of employment growth rising by almost 48,000 between 1991 and 1996, 20% of the net increase in

employment and almost twice that of the next highest group: Legislators, Administrators & Managers who grew by almost 27,000.

- Between 1996 and 2001, Professionals were the main drivers of growth with employment levels rising by just over 43,000, 44% of the net change in employment and well ahead of the next highest group: Legislators Administrators & Managers with growth of 27,000.

Overall net employment growth was much lower in the latter half of the 1990s with a number of occupational groups posting marked declines:

- Agriculture & Fishery Worker employment fell by over 16,000 between 1996 and 2001, following a rise of 26,000 in the previous five years.
- Elementary Occupations also experienced contrasting fortunes with employment rising by just over 11 thousand between 1991 and 1996, and falling by just under 11,000 between 1996 and 2001.

Table 6 shows the effect of these employment changes on the employment shares of the nine major occupational groups.

Table 6. Occupational Employment in 1991, 1996 and 2001

| Major Group | Employment (000s) | | | Share of total employment % | | |
|--------------------------------------|-------------------|--------------|--------------|-----------------------------|------------|------------|
| | 1991 | 1996 | 2001 | 1991 | 1996 | 2001 |
| 1 Legislators/Admin/Managers | 162 | 189 | 216 | 11.6 | 11.6 | 12.5 |
| 2 Professionals | 172 | 197 | 240 | 12.1 | 12.1 | 13.9 |
| 3 Ass. Professionals/Technicians | 147 | 173 | 191 | 10.6 | 10.6 | 11.0 |
| 4 Clerks | 201 | 216 | 216 | 13.3 | 13.3 | 12.5 |
| 5 Service/Sales Workers | 178 | 226 | 242 | 13.9 | 13.9 | 14.0 |
| 6 Agriculture/Fishery Worker | 137 | 154 | 137 | 9.4 | 9.4 | 8.0 |
| 7 Trades Workers | 149 | 148 | 145 | 9.1 | 9.1 | 8.4 |
| 8 Plant/Machine Operators/Assemblers | 132 | 136 | 144 | 8.3 | 8.3 | 8.3 |
| 9 Elementary Occupations | 100 | 111 | 101 | 6.8 | 6.8 | 5.8 |
| Total* | 1,400 | 1,630 | 1,727 | 100 | 100 | 100 |

*Including non-applicable

The table shows that the largest occupational groups identified in 2001 were, generally speaking, also the largest groups ten years earlier and that subsequent employment growth in these groups has increased their share of total employment.

- Service & Sales Workers and Professionals were two of the largest occupational groups in 1991 and have subsequently been the main contributors to employment growth, albeit at different times.
- Legislators, Administrators & Managers another large group in 1991, saw consistently robust growth over the whole period.

Most other occupational groups have seen their share of employment decline as a result.

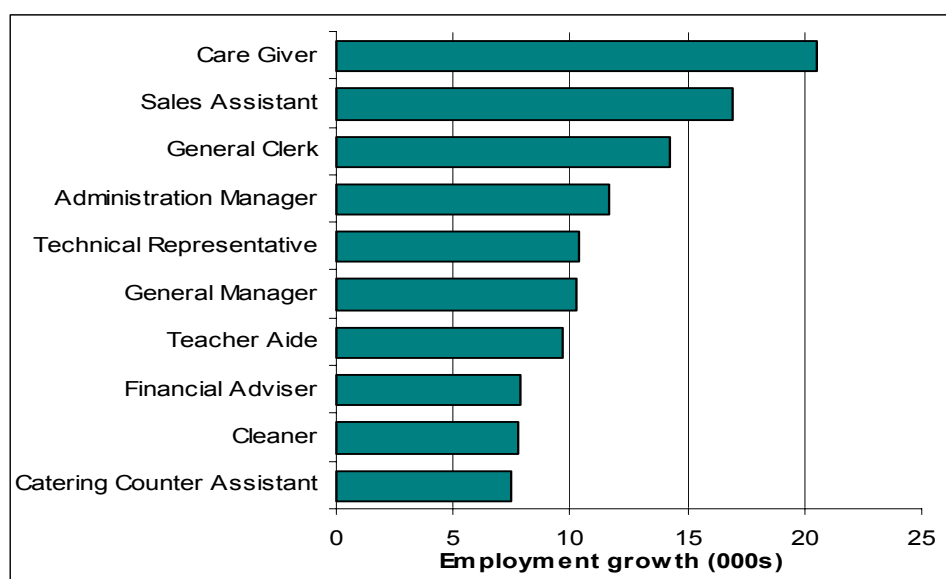
The main contributors to employment change

The following analysis examines in more detail the changes in employment between 1991 and 2001. It shows that a large share of new jobs and disappearing jobs occurred within a relatively small number of occupations. In order to identify these drivers it is first important to split overall net employment growth between those occupations that grew, from those that declined.

Growing Occupations

Of the 562 occupational titles in NZSCO99, 365 of these grew in employment between 1991 and 2001². Chart 5 shows the largest contributors to growth over the whole decade.

Chart 5. Top 10 contributors to employment growth 1991 to 2001



The concentration of gross employment growth between 1991 and 2001 amongst just a few occupations can be summarised as follows:

- The ten occupations whose employment rose the most, contributed 29% to the total rise
- The top twenty growing occupations contributed 44%
- The top thirty growing occupations contributed 53%

Table 7 below shows the occupations that grew the most from 1991 to 1996, and from 1996 to 2001. The change in employment for each occupation is calculated as a percentage of the total increase in all occupations that grew, or the ‘gross’ increase. Making this calculation gives an idea of how much each occupation contributed to job growth, it does not show an occupation’s growth relative to its own size.

² In following analysis agricultural occupations are excluded from any comparison of 1991 and 1996 census data. The decision to erase the occupation title ‘Farm worker’ in the 1995 revision, (of which there were over 9,000 in 1991), means that we can not be sure whether employment increases in agricultural occupations between 1991 and 1996 are actual rises in the numbers employed or simply the result of statistical reclassification.

Table 7. The Main Contributors to Gross Employment Growth

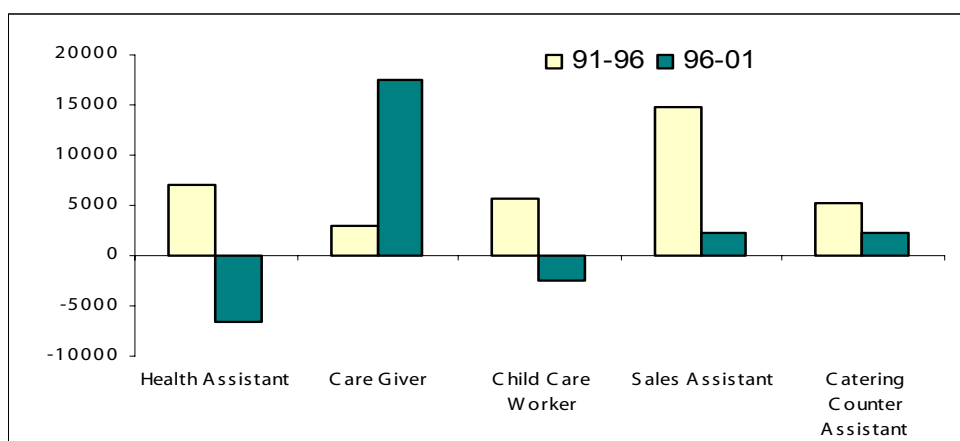
| 1991 to 1996 | | | 1996 to 2001 | | |
|---|--------|-----|--------------------------------------|--------|-----|
| Major Group & Occupation | No. | % | Major Group & Occupation | No. | % |
| 5 Sales Assistant | 14735 | 6 | 5 Care Giver | 17475 | 9 |
| 1 General Manager | 9433 | 4 | 1 Administration Manager | 11337 | 6 |
| 4 General Clerk | 8223 | 3 | 3 Technical Representative | 7668 | 4 |
| 9 Cleaner | 7389 | 3 | 4 General Clerk | 6054 | 3 |
| 5 Health Assistant | 7032 | 3 | 2 Financial Adviser | 5307 | 3 |
| 9 Courier and Deliverer | 5610 | 2 | 2 Computer Applications Engineer | 5133 | 3 |
| 5 Child Care Worker | 5598 | 2 | 2 Systems Manager | 4749 | 2 |
| 4 Information Clerk/ Other Receptionist | 5241 | 2 | 3 Teacher Aide | 4428 | 2 |
| 3 Teacher Aide | 5184 | 2 | 1 Office Manager | 4332 | 2 |
| 5 Catering Counter Assistant | 5175 | 2 | 8 Automated Machine Operator | 4290 | 2 |
| Total gross employment growth top 10 | 73620 | 28 | Total gross employment growth top 10 | 70773 | 33 |
| Total gross increase | 263562 | 100 | Total gross increase | 198993 | 100 |

Table 7 shows that some of these occupations in chart 5 have seen consistent growth throughout the whole ten-year period, for instance Teacher Aid. But for most, the growth has been more sporadic. For example, Care Givers mainly experienced employment growth between 1996 and 2001, Sales Assistants between 1991 and 1996. The rest of this section will therefore deal with 1991 to 1996 and 1996 to 2001 as separate periods. The occupations in table 7 will be looked at in the context of their contribution to growth in their own major groups, in order to show even more clearly the significance of their impact on employment growth.

Service and Sales Workers

In the Sales & Service Workers major group, employment growth mainly occurred between 1991 and 1996 with a comparatively small rise in the five years after (see table Occupational Composition of Employment Growth 1991 to 2001). Out of the major contributors to this growth, the trend is followed by Sales Assistants, and in a more modest sense by the growth in Health Assistants, Childcare workers and Catering Counter Assistants. However the rise of over 17,000 in the number of Care Givers between 1996 and 2001 contributed greatly to the relatively small rise in Sales & Service Workers in this later period.

Chart 6. Sales and Service Workers, decomposing occupational growth



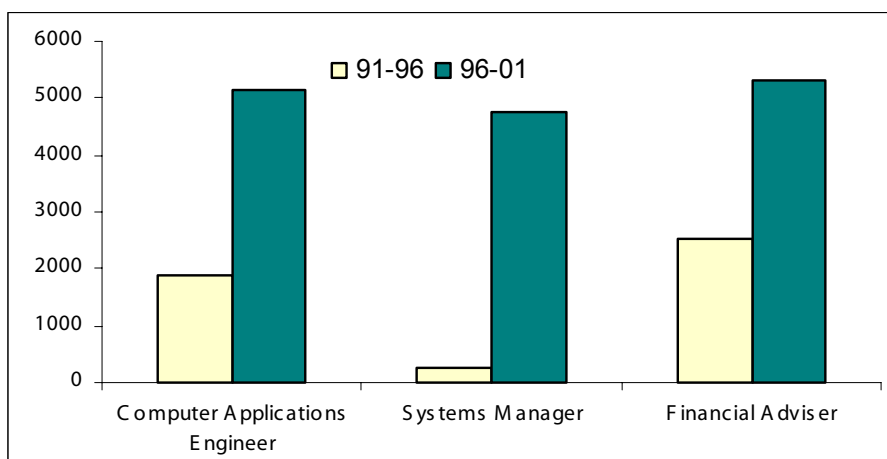
- Care Giver was the largest contributor to total gross employment growth between 1996 and 2001. Rising by almost 17,500, it made up 54% of the gross employment increase in Service & Sales Workers during this period. They provide general household assistance, care and companionship for aged or disabled people in their homes.
- Sales Assistant was the largest contributor to total gross employment growth between 1991 and 1996. Rising by 14,700 it made up 29% of the gross employment increase in Service & Sales Workers during this period.
- Health Assistant was the fifth largest contributor to total gross employment growth between 1991 and 1996. Rising by over 7,000, it made up 14% of the gross employment increase in Service & Sales Workers during this period. Health Assistants help the sick, disabled and elderly in the home or wider community.
- Child Care worker was the seventh largest contributor to total gross employment growth between 1991 and 1996. Rising by almost 5,600, it made up 11% of the gross employment increase in Service & Sales Workers during this period.
- Catering Counter Assistant was the tenth largest contributor to total gross employment growth between 1991 and 1996. Rising by almost 5,200, it made up 10% of the gross employment increase in Service & Sales Workers during this period. They serve food and beverages to customers in a cafeteria, canteen, snack bar or take-away outlet.

Although these occupations are placed within the same major group, they still differ in their area of specialisation. Sales Assistants are classified under Sales Persons, Demonstrators and Models. Catering Counter Assistants are grouped as Housekeeping and Restaurant Services Workers. Care Givers, Health Assistants and Child Care workers are Personal Care Workers.

Professionals

In the Professional major group as a whole, the bulk of the employment rise occurred in the later half of the decade (see table Occupational Composition of Employment Growth 1991 to 2001). This trend is mirrored in all three of the main contributor occupations, particularly Systems Managers.

Chart 7. Professionals, decomposing employment growth

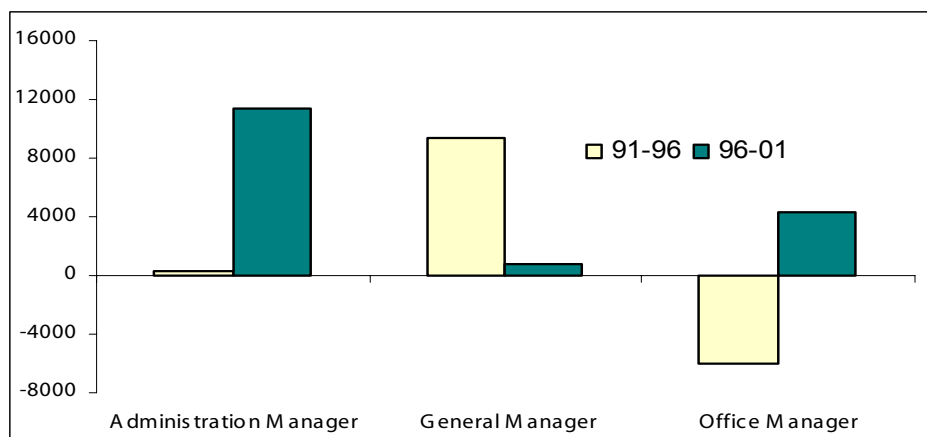


- Financial Adviser was the fifth largest contributor to total gross employment growth between 1996 and 2001. Rising by over 5,300 it made up 10% of the gross employment increase in Professionals during this period. They also rose by over 2,500 in the earlier period contributing 8% to gross employment growth in Professionals. Financial Advisers collect and analyse financial marketplace information and provide financial and investment advice to clients.
- Computer Applications Engineer was the sixth largest contributor to total gross employment growth between 1991 and 2001. Rising by over 5,100, it made up 10% of the gross employment increase in Professionals during this period. They maintain operating software, assess its efficiency and identify/develop new software.
- Systems Manager was the seventh largest contributor to total gross employment growth between 1991 and 2001. Rising by over 4,700, it made up 9% of the gross employment increase in Professionals during this period. Their remit is much broader than the software focus of Computer Applications Engineers. Systems Managers control the operating effectiveness of computing systems, arranging maintenance and enhancements.

Managers

The employment increase in this major group was of similar magnitude in both halves of the decade. However, as chart 8 shows, this trend was not mirrored in the main contributory occupations. Administration Managers rose by over 11,300 and contributed 34% to the gross employment increase in Legislators, Administrators and Managers between 1996 and 2001. Office Managers rose by over 4,300 and contributed 13% over this period and General Managers rose by over 9,400, contributing 29% between 1991 and 1996.

Chart 8. Managers, decomposing occupational employment growth



Refer to the earlier section on the largest occupations in 2001 for a description of Administration and General Managers.

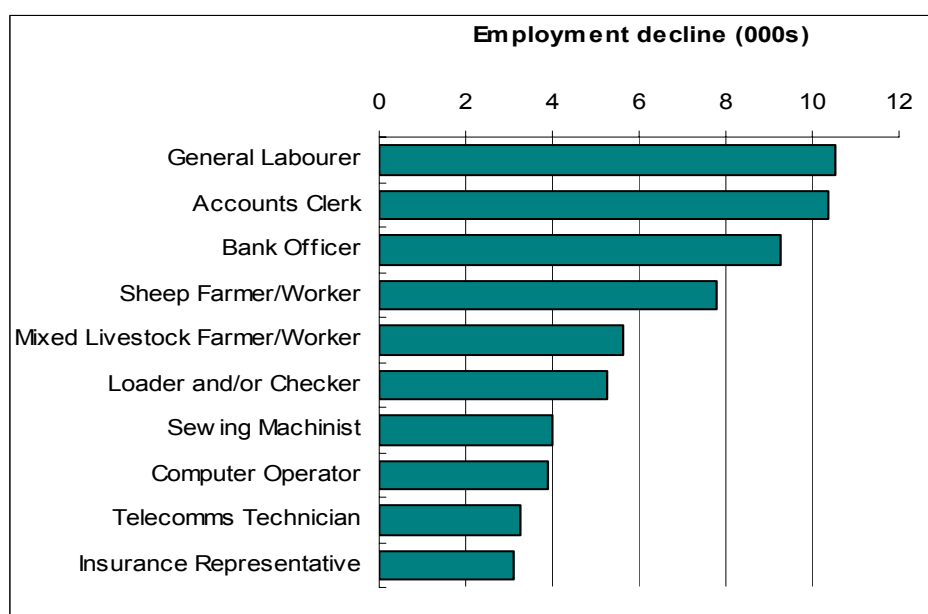
Other occupational groups

- Despite the Clerks major group experiencing a relatively small increase in employment between 1991 and 1996, and static levels thereafter, two occupations make it into the top contributors in table 7. Clerks are a group of two halves. Just over half of the occupations (20) grew in employment between 1991 and 2001, while the rest fell. General Clerks rose by over 8,200 and contributed 37% to the gross employment increase in Clerks between 1996 and 2001, and 24% between 1991 and 1996. Information Clerks & Other Receptionists rose by over 5,200 and contributed 15% during this earlier period (refer to the earlier section on the largest occupations in 2001 for job descriptions).
- Two of the top contributors in table 7 are from the Technicians and Associate Professionals major group. Between 1996 and 2001, Technical Representatives rose by over 7,600 and contributed 21% to the gross employment increase in this group and Teacher Aides, rising by over 4,400, contributed 12%. In the 1991 to 1996 period, Teacher Aids also rose by almost 5,200 and contributed 14% to the gross employment increase in Technicians and Associate Professionals (refer to the earlier section on the largest occupations in 2001 for a job description of Technical Representatives).
- Only one occupation in the top contributors is from the Elementary Workers major group. Cleaners rose by almost 7,400 and contributed 42% of the gross employment increase in this group between 1991 and 1996.

Declining Occupations

Of the 562 occupational titles in NZSCO99, 197 of these declined in employment between 1991 and 2001. Chart 9 below shows the ten occupations that declined the most between 1991 and 2001.

Chart 9. Top 10 contributors to employment decline 1991 to 2001



Compared to those occupations that have been growing, the concentration of this gross decline amongst a small number of occupations is even more marked:

- The top ten declining occupations contributed 47%;
- The top twenty declining occupations contributed 64%;
- The top thirty declining occupations contributed 74%.

Table 8 below shows the occupations that declined the most from 1991 to 1996³, and from 1996 to 2001. The decline in employment for each occupation is calculated as a percentage of the total decline in all declining occupations, or the ‘gross’ decline. Making this calculation gives an idea of how much each occupation contributed to job decline.

Table 8. Main Contributors to Gross Employment Decline

| 1991 to 1996 | | | 1996 to 2001 | | |
|---------------------------------------|--------|-----|---------------------------------------|---------|-----|
| Major Group & Occupation | No. | % | Major Group & Occupation | No. | % |
| 4 Accounts Clerk | -8757 | 11 | 9 General Labourer | -9285 | 8 |
| 1 Office Manager | -5925 | 7 | 6 Sheep Farmer/Worker | -7956 | 7 |
| 6 Mixed Livestock Farmer/Worker | -5466 | 7 | 5 Health Assistant | -6554 | 6 |
| 4 Bank Officer | -4149 | 5 | 4 Secretary | -5811 | 5 |
| 9 Loader and/or Checker | -4107 | 5 | 1 Retail Manager | -5202 | 4 |
| 3 Telecommunications Technician | -2460 | 3 | 4 Bank Officer | -5112 | 4 |
| 4 Typist and Word Processor Operator | -2322 | 3 | 6 Dairy Farmer, Dairy Farm Worker | -3630 | 3 |
| 5 Armed Forces | -2082 | 3 | 3 Sales Representative | -3132 | 3 |
| 3 Mechanical Engineering Technician | -2046 | 3 | 6 Cattle Farmer, Cattle Farm Worker | -2583 | 2 |
| 8 Sewing Machinist | -1842 | 2 | 5 Child Care Worker | -2422 | 2 |
| Total gross employment decline top 10 | -39156 | 48 | Total gross employment decline top 10 | -51687 | 45 |
| Total gross decline | -81699 | 100 | Total gross decline | -115929 | 100 |

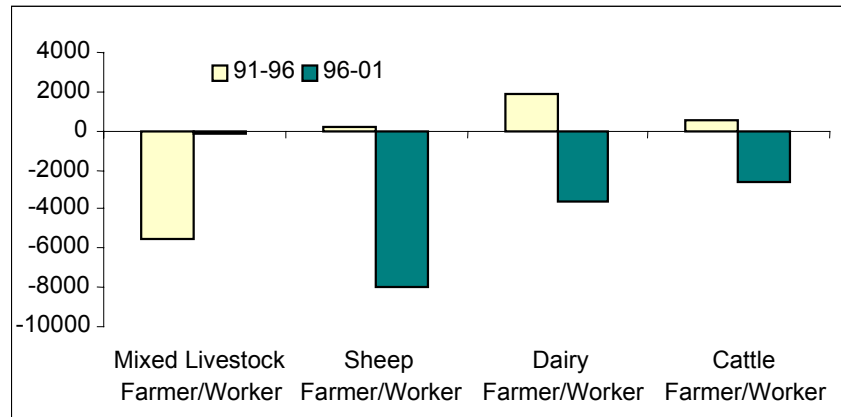
Table 8 shows that some of these occupations in chart 9 such as Bank Officer have seen consistent decline throughout the whole ten-year period. But for most, the decline has been less balanced. For example, General Labourers mainly experienced employment falls between 1996 and 2001, and Accounts Clerks declined mostly between 1991 and 1996. The rest of this section will therefore deal with 1991 to 1996 and 1996 to 2001 as separate periods. The occupations in table 8 will be looked at in the context of their contribution to declines in their respective major groups, in order to show even more clearly the significance of their impact on employment.

Agriculture and Fishery Workers

Four Agricultural & Fishery occupations appear in the top contributors to gross employment decline in table 8. As a whole, this group experienced a rise in employment in the early part of the 1996 but the later period saw a fall of similar magnitude such that employment levels were static over the whole period. The occupations that contributed most to overall gross employment decline appear mainly in this later period, but Mixed Livestock Farmer/Workers buck the trend. Chart 10 decomposes the growth in these occupations.

³ Agricultural workers have been included in this part of the analysis. The decision to erase the title ‘Farm worker’ in the 1995 revision, of which there were over 9,000 in 1991 made it difficult to compare occupational employment increases between the 1991 and 1996 censuses. There may still have been an impact on declining occupations but only that actual declines may be under-estimated.

Chart 10. Agriculture and Fishery Workers, decomposing employment decline

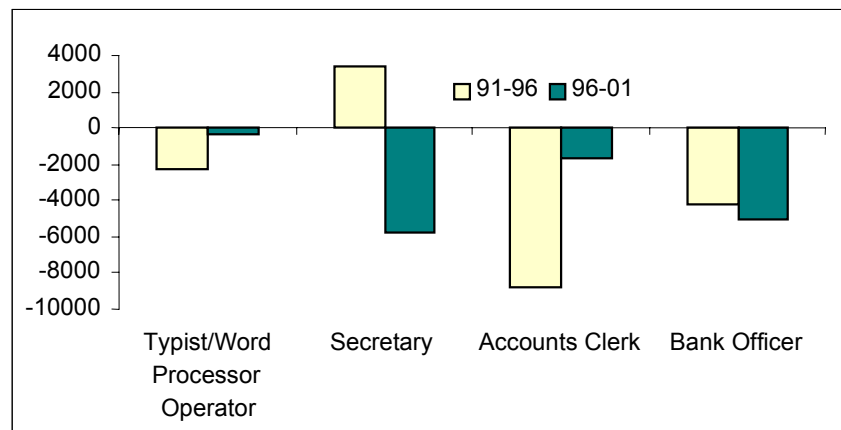


- Sheep Farmer & Sheep Farm Worker was the second largest contributor to total gross employment decline between 1996 and 2001, falling by almost 8,000 and making up 36% of the gross decline in Agricultural & Fishery Workers over the period.
- Mixed Livestock Farmer & Mixed Livestock Farm Worker was the third largest contributor to total gross employment decline between 1991 and 1996, falling by almost 5,500 and making up 65% of the gross decline in Agricultural & Fishery Workers over the period.
- Dairy Farmer & Dairy Farm Worker was the seventh largest contributor to total gross employment decline between 1996 and 2001, falling by over 3,500 and making up 17% of the gross decline in Agricultural & Fishery Workers over the period.
- Cattle Farmer & Cattle Farm Worker was the ninth largest contributor to total gross employment decline between 1996 and 2001, falling by over 2,500 and making up 12% of the gross decline in Agricultural & Fishery Workers over the period.

Clerks

The previous section on expanding occupations described Clerks as a group of two halves. The marginal net employment rise posted by this group in the 1990s is the result of a number of growth occupations being countered by a significant share of occupations in decline (14 declined out of the 34 in the major group). Four of these declining occupations appear in table 8. Chart 11 looks in more detail at the pattern of growth in these occupations.

Chart 11. Clerks, decomposing employment decline

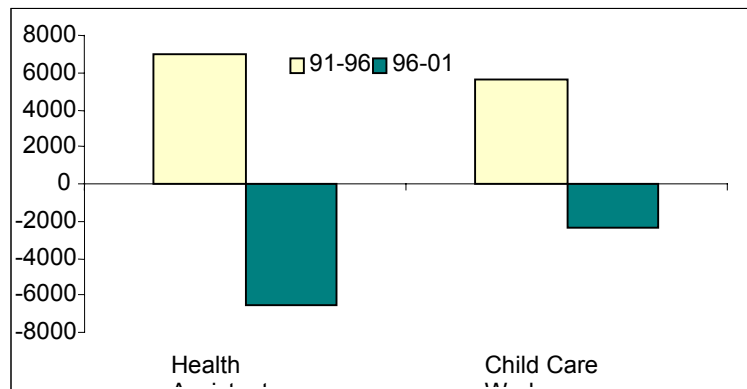


- Accounts Clerk was the largest contributor to the total gross employment decline between 1991 and 1996, falling by over 8,700 and making up 46% of the gross decline in Clerks over this period (refer to the earlier section on the largest occupations in 2001 for a description of Accounts Clerks).
- Secretary was the fourth largest contributor to the total gross employment decline between 1996 and 2001, falling by over 5,800 and making up 36% of the gross decline in Clerks over the period.
- Bank Officer was the fourth largest contributor to the total gross employment decline between 1991 and 1996, falling by over 4,100 and making up 22% of the gross decline in Clerks over the period. This occupation was also the sixth largest contributor to the total gross employment decline between 1996 and 2001, falling by over 5,100 and contributing 31% of the gross employment decline in Clerks during this period. Bank Officers deal directly with clients helping them with deposits, withdrawals and related matters.
- Typist & Word Processor Operator was the seventh largest contributor to the total gross employment decline between 1991 and 1996, falling by over 2,300 and making up 12% of the gross decline in Clerks over the period.

Service and Sales Workers

One of the two highest growing major groups, professionals are not represented in table 8 but three occupations from the Service and Sales Workers group do appear. The main period of employment growth in this group occurred between 1991 and 1996. During this period, the only occupation from the group to appear in table 8 is the Armed Forces. This is arguably a special case since their numbers depend on government policy. However it is in the later period, when employment growth in Service and Sales Workers was much lower, that the other two occupations appear. Chart 12 shows the patterns of decline.

Chart 12. Service and Sales Workers, decomposing employment decline



- Health Assistant was the third largest contributor to the total gross employment decline between 1996 and 2001, falling by over 6,500 and making up 41% of the gross decline in Service and Sales Workers over the period.
- Child Care Worker was the tenth largest contributor to the total gross employment decline between 1996 and 2001, falling by over 2,400 and making up 15% of the gross decline in Service and Sales Workers over the period.

These occupations experienced contrasting fortunes over the ten-year period, both being one of the largest contributors to gross employment growth between 1991 and 1996.

Technicians & Associate Professionals

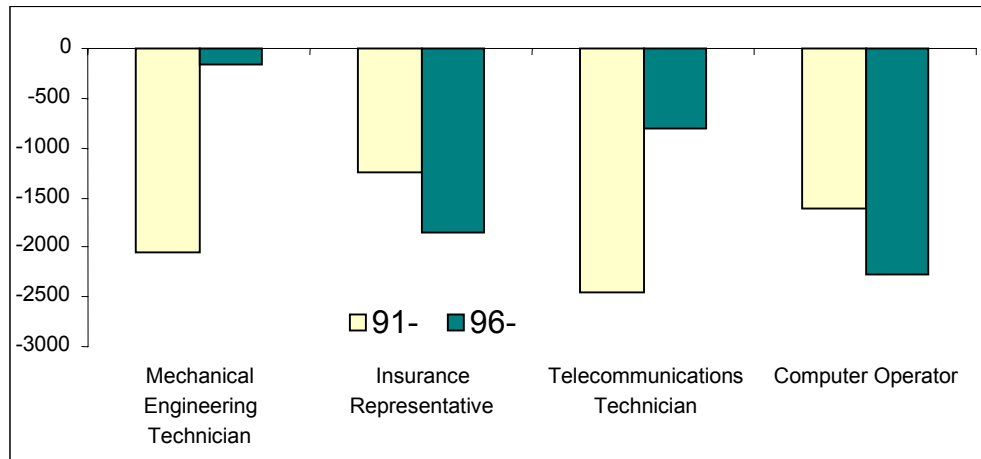
Between 1991 and 2001, the net increase in employment in this major group was the fourth highest thanks to consistent growth throughout the decade (see table Occupational Composition of Employment Growth 1991 to 2001). However growth was strongest in the earlier period and the two occupations that appear in table 8's top contributors to overall gross employment decline, certainly buck this trend.

- Telecommunications Technician was the sixth largest contributor to total gross employment decline between 1991 and 1996, falling by over 2,400 and making up 21% of the gross decline in Technicians & Associate Professionals over the period. Telecommunication Technicians normally work under the supervision of a telecommunications engineer, designing, developing, constructing, operating, maintaining and repairing telecommunications systems and equipment.
- Mechanical Engineering Technician was the ninth largest contributor to total gross employment decline between 1991 and 1996, falling by over 2,000 and making up 17% of the gross decline in Technicians & Associate Professionals over the period. Normally under the supervision of a mechanical engineer, they design, develop, manufacture, construct, install, operate, maintain and repair mechanically functioning plant and equipment.

Although they don't appear as top contributors to gross employment decline in table 8 in either of the two periods, chart 9 shows that across the whole decade Computer Operators and

Insurance Representatives did have a significant impact. Chart 13 decomposes the growth in these four occupations.

Chart 13. Technicians and Associate Professionals, decomposing employment decline



Other occupational groups

The largest contributor to gross employment decline between 1996 and 2001 was General Labourers. Falling by almost 9,300 they contributed 76% to the gross decline in elementary workers in this period. Between 1991 and 1996 Loaders and/or checkers fell by over 4,100 and they contributed 66% to the gross decline in Elementary Workers.

Conclusion

A large share of New Zealand employment is classified as just a small number of occupations. Census data from 2001 shows that approximately 33% of New Zealand employment is concentrated in just twenty occupational titles, the largest by far being the 85,000 Sales Assistants. Occupational changes are also concentrated in a small number of occupations. Taking only occupations that grew between 1991 and 2001, the top twenty growers contributed 44% of the total growth. Over the same period, the concentration in occupations that declined is even more marked. The twenty largest occupations in decline contributed 64% to the total in all declining occupations.

REFERENCES

- Australian Bureau of Statistics (2002). www.abs.gov.au/
- Bikson, T.K., (1994). "Organizational Trends and Electronic Media," *American Archivist*, Vol. 57(1), pp. 48-68.
- Bikson, T.K. and Law, S.A., (1995). "Toward the Borderless Career: Corporate Hiring in the '90s," *International Educator*, Vol. 4(2), pp. 12-33.
- Boothby, D., (1999). *Literacy skills, the knowledge content of occupations and occupational mismatch*, Applied Research Branch, Strategic Policy, Human Resources Development Canada, Research Paper W-99-3E, August.
- Boyett, J. H., & Snyder, D. P. (1998). "Twenty-first Century Workplace Trend", *On the Horizon*, 6(2).
- Braddock, D., (1999), "Occupational employment projections to 2008," *Monthly Labor Review*, pp. 51-77.
- Campbell, M., Baldwin, S., Johnsin, S., Chapman, R., Upton, A. & Walton, F., (2001). *Skills in England 2001, The Research Report*, Policy Research Institute, Leeds Metropolitan University, www.lmu.ac.uk/lbs/pri
- Commission on Behavioral and Social Sciences and Education (CBSE)., (1999). *The Changing Nature of Work: Implications for Occupational Analysis*.
- Conway, P., & McLoughlin, S., (2002). "Labour market trends and outlooks", *Labour Market Bulletin 2000-02 Special Issue*, pp. 1-25.
- Department of Labour., (2001). *Workforce 2010*. Wellington: Author.
- Department of Labour in the United States., (2000). *Futurework: Trends and challenges for work in the 21st Century*, Authors.
- Dore, R., (1997). *The Diploma Disease: Education, Qualification and Development*, (2nd edition), Institute of Education, University of London.
- Elias, P., (1997). "Occupational classification (ISCO-88): Concepts, methods, reliability, validity and cross-national comparability", *Labour Market and Social Policy Occasional Papers*, 20. Paris: Organisation for Economic Co-operation and Development.
- Elias, P., & McKnight, A. (2001). "Skill measurement in official statistics: Recent developments in the UK and the rest of Europe", *Oxford Economic Papers*, 3, pp. 508-540.
- Elias, P., McKnight, A., & Kinshott, G., (1999). "Redefining skill revision of the Standard Occupational Classifications", *Skill Task Force, Research Paper 19*.
- Engelbrecht, H., (1999). *Changes in the information work force of a strongly reforming economy: The case of New Zealand 1976-1996*, <http://econ.massey.ac.nz/Publications/>

Green, F., (1998). "The value of skills", *Studies in Economics, Number 98/19*, University of Kent at Canterbury.

Green, F., Felstead, A., & Gallie, D., (2000). *Computers are even more important than you thought: An analysis of the changing skill-intensity of jobs*. London School of Economics, Centre for Economic Performance, Discussion Paper No. 439. January.

Haskel, J., & Holt, R., (1999). "Anticipating future skill needs: Can it be done? Does it need to be done?," *Skill Task Force, Research Paper 1*.

Hazledine, T., (2001), "Measuring the New Zealand transaction sector, 1956-98, with an Australian comparison", *New Zealand Economic Papers, 35(1)*, pp. 77-100.

Hoffmann, E., (1999), "International statistical comparisons of occupational and social structures: Problems, possibilities and the role of ISCO-88", *International Labour Office*.

Hoffmann, E., (2001), "Implementing and updating the International Standard of Classifications of Occupations: Issues, experiences and possibilities", *Meeting of the Expert Group on International Economic and Social Classifications*, Department of Economic and Social Affairs Division, ESA/STAT/AC.78/8.

Kelinson, J.W., & Tate, P., (2000), "The 1998-2008 Job Outlook in Brief," *Occupational Outlook Quarterly*, pp. 2-39.

Lavoie, M., & Roy, R. (1998). *Employment in the knowledge-based economy: A growth accounting exercise for Canada*. Applied Research Branch, Strategic Policy, Human Resources Development Canada, Research Paper R-98-8E, June.

Letcher, M. (2002). *Making Your Future Work*.

MacLeod, A., (2000). *The Importance of Soft Skills in the Current Canadian Labour Market*. Sectoral and Occupational Studies, Human Resources Development Canada, April.

Meltz, N. M., (1999). *The Managerial Workforce in Canada: A Century of Change*. Applied Research Branch, Strategic Policy, Human Resources Development Canada, Research Paper T-99-2E, August.

Pool, I., & Bedford, R., (1997). *Population change: From dynamics and structures to policies*. Background paper prepared for plenary session at the Population Conference, Wellington, 12-14 November. Hamilton: Population Studies Centre.

Pool, I., & Honey, J., (1998). "The scientific workforce: implications for New Zealand's future science infrastructure," *Population Studies Centre Discussion Papers*. Hamilton: Population Studies Centre.

Robinson, P., & Manacorda, M., (1997). *Qualifications and the labour market in Britain: 1984-94 skill biased change in the demand for labour or credentialism*, London School of Economics, Centre for Economic Performance, Discussion Paper No. 330. February.

Sheehan, P., (1998). "The changing nature of work: Some implications", *Australian Bulletin of Labour*, 24 (4), pp. 317-332.

Statistics New Zealand (1999). *New Zealand Standard Classifications of Occupations 1999 Handbook*, <http://www.stats.govt.nz/>

Stasz, C., McArthur, D., Lewis, M., & Ramsey, K., (1990). *Teaching and Learning Generic Skills for the Workplace*, Santa Monica CA.

Warwick Institute for Employment Research (WIER), (2002a), *Skillsbase: Labour Market Information Database*, <http://www.skillsbase.dfee.gov.uk/>

Warwick Institute for Employment Research (WIER), (2002b), *Skills in England 2001*, the Research Report, <http://www.skillsbase.dfee.gov.uk/>

Working Party on Employment and Unemployment Statistics (WPEUS), (2002). *Measures of skill from labour force surveys – An assessment*, Organisation for Economic Co-operation and Development, DEELSA/ELSA/WP7(2002)3, May.