

**A NEW INTERNATIONAL SOCIO-ECONOMIC INDEX [ISEI] OF  
OCCUPATIONAL STATUS FOR THE INTERNATIONAL STANDARD  
CLASSIFICATION OF OCCUPATION 2008 [ISCO-08] CONSTRUCTED WITH  
DATA FROM THE ISSP 2002-2007; With an analysis of quality of occupational  
measurement in ISSP.**

Paper presented at Annual Conference of International Social Survey Programme, Lisbon,  
May 1 2010

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**Summary**

A socio-economic index of occupational status scales occupations by the average level of education and average earnings of job holders. In this paper I report on a project to construct a new International Socio-Economic Index [ISEI-08] of occupational status, using data from pooled ISSP waves 2002-2007 on almost 200.000 men and women in 42 countries. Construction of such a new index is called for, since international projects such as PIAAC and PISA (and likely ISSP some time soon) will adopt the new 2008 version of ISCO as their coding standard. It turns out that a reasonable approximation of this classification can be obtained using conversion of the occupation data in ISSP. It also turns out that ISSP, with its broad international coverage and detailed country specific measurement of education and earnings constitutes a fine database for estimating a new ISEI.

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**ISCO-08**

- Recently, ILO has launched a new version of the International Standard Classification of Occupations, referred to as ISCO-08. Although the ILO has decided on the ISCO-structure in late 2007, no manual is available yet.
- The revision has been announced as a “minor” revision. While the general logic (and major group (one-digit) structure) of the classification has remained largely the same, there are many changes in details such as the organization of sub-major and minor groups, and some new occupations have been added. There is no one-to-one correspondence between ISCO-08 and ISCO-88.
- Survey researchers will have to learn about how to use the new classification soon, as it will be applied in official statistics and census data (at least in the EU) as of 2011. For this reason, two major international social research projects, PIAAC (successor to IALS) and PISA have decided to use ISCO-08 in their upcoming rounds.
- Social researchers are usually not interested in occupational classifications *per se*, but in derived occupational status measures, such as SIOPS (prestige), ISEI (socio-economis status) and EGP/ESEC (classes). Such derivations are currently available for ISCO-68 and ISCO-88 and are heavily used by the research community. Development of new versions of these status measures would require the availability of data coded in the new classification (or even double coded), either to construct the measure (ISEI), or for validation (all three measures). Such databases must be large scale, detailed, cross-nationally comparable and have adequate information on criterion variables, in particular education and earnings.
- Such data do not exist as of yet, nor will they be available soon. For projects like ISSP and ESS, which might produce such data, the non-availability of derived status measures might actually prevent them from moving to the new classification.

## **Creating ISEI-08**

- A way out of this stalemate is to use ISCO-88 data as a substitute, recode these as best as possible into ISCO-08 and then use this database as a source for creating an ISEI-08 measure, as well as parallel measures for SIOPS and EGP/ESEC for ISCO-08.
- While it is not possible to convert ISCO-88 into ISCO-08 without distortion and loss of information, this substitute strategy actually goes a long way. The substitution is helped by information that ILO provides on its website on the many-to-many mappings between ISCO-88 and ISCO-08.
- A larger problem than loss / distortion of information is in fact that ISCO-08 presents some occupations that are truly new and do not have a parallel in ISCO-88. The most important instance is the new sub-major group 9400 (Food Preparation Assistants). Many other examples occur at the minor group and unit group level. Some of these occupations occur for the first time (Web Designer), but quite a few others (Bicycle Repairman, Gas Station Attendant, Shop Keeper) have actually counterparts in ISCO-68! As we have ISEI codes available for ISCO-68, we can use this to plug in a value in ISEI-08.
- Figure 1 displays the basic logic used to justify the ISEI concept and the way it is estimated from empirical data. The idea is that education affects income (mostly) via occupation. Occupational status is thus conceptualized as the property of occupations that converts educational qualifications into income. As a consequence, ISEI scores are estimated as an optimal scaling of detailed occupation groups as a mediating variable, that arises if the direct effect of education on income is minimized.

## **Using ISSP as a database for estimating ISEI-08**

- ISSP provides an excellent database for estimating ISEI scores, as it has detailed occupation coding (but see below), good measurement of education and personal income, is of large scale and cross-nationally very varied.
- To estimate a new ISEI score I pooled the data from modules 2002-2007 from ISSP, covering almost 200.000 cases with complete information on occupation, education and personal income in 42 countries.

- The ISCO-88 codes in these data were transferred as closely as possible into ISCO-08 codes with a many-to-one transformation, that was constructed with the help of the many-to-many correspondence tables on the ILO website.
- The basic procedures then follow the ones used for creating ISEI for ISCO-68 and ISCO-88. They involve (A) standardizing education and personal income between datafiles, (B) defining a detailed ISCO-08 code that contains groups of N=21 or more, (C) with this dataset, estimating an optimal scaling that minimizes the direct effect of education on earnings, and – by consequence – maximizing the indirect effect of education on earnings via occupation; (D) the estimated scale scores are expressed in a 10-90 metric and generalized to the smaller groups that were merged with similar ones in step B.

### **Validation**

- Although the procedure is aimed at creating an ISEI score for ISCO-08, it effectively also amounts to estimating a new ISEI score for ISCO-88. The difference between the two versions is only in the database on which it is estimated. The new version is estimated from 200.000 working men and women in 42 ISSP countries surveyed in 2002-2007, while the former versions derived from some 70.000 full-time employed men in databases on social mobility collected in 17 countries between 1962 and 1988. Note that the database now covers men and women, while previously only men were taken into account.
- It is possible to validate the new scale by comparing it to the old one, using the same data. The two scales correlate 0.92 in the ISSP data and 0.91 in the ESS Round 1 2 3 4 data. In ESS a very informative validation model can be estimated that uses both scales to examine how occupations of respondent and spouse transmit education into *household* income (Figure 1). Since this is a two-sided model on a relatively large dataset (N=48.000) that allows for equality constraints between the spouse's and respondent's side, this model gives very precise estimates.
- The results are fairly favorable to the newly constructed ISEI-08, as is directly expressed by the measurement coefficients (0.98 for the new scale, 0.94 for the old scale). The improvement by 4% is entirely due to the higher quality of the ISSP database relative to the database used earlier! One way to interpret these numbers is that any regression or correlation coefficient will be increased by 4% if the new scale is used and not the old one.

- The measurement coefficient of 0.98 is significantly different from 1.00, which means that the old ISEI picks up some information that is not covered by the new scale.

### **The quality of occupation codes in ISSP 2002-2007**

- The analysis reported on in the previous paragraph is testimony to relative high quality of the occupational information in the ISSP *on average*. This does not imply that the occupation is alright in each and every ISSP country in every round.
- One dimension to look at before going to a formal validation analysis, is how ISCO coding is actually practiced in ISSP. ISSP specifications call for a coding in full four-digit details, which can be either done by direct coding into ISCO, or by converting a national detailed code into ISCO. Table 1 shows how many details are actually used by the countries. In total ISCO-88 allows for over 600 categories, of which 556 (number not shown in the table) are actually used in the total database. The record is held here by Germany, that passes the 260 mark several times. A fair amount of countries uses somewhere between 150 and 250 titles. A somewhat reduced number is used by Brazil, Cyprus and Philippines. The Philippines began to put in some more detail in 2005. Two countries use only three digits (and 70-80 categories): France and Finland. Finally, two countries submit data with only one digit: South-Africa and Venezuela.
- There is no straightforward connection between number of digits used and quality of coding. Whether additional digits help to measure occupational status, depends quite a bit on where and how the digits are omitted. The most problematic instance no doubt is in the case of farmers, which ISCO-88 allows to code as 1311 (a four digit code grouped with other 'General Managers') or as 6000 (a separate major group), but there are other instances in which large status differences occur within major or sub-major groups (Nurses and Doctors are another instance). However this may be, the crude codes provided by South-Africa and Venezuela are clearly sub-standard and one wonders why these data have been accepted by ISSP.
- Note that no country has used only 2 digits to code occupations, although that is actually a reasonable alternative to using only one.
- One obvious coefficient to look at for validation is that of occupational homogamy: how are spouses' occupations correlated? If occupations are badly measured, this will show up as a low correlation. Unfortunately, this logic is ultimately not compelling: there might be

country specific levels of occupational homogamy and this might be heavily influenced by the prevalence of farming in a country and how farm occupations are processed.

- The logic of the ISEI construction allows for a better check of the quality of occupational measurement in separate ISSP studies. This emerges when we analyze the degree to which occupations mediate the relationship between education and earnings. Theoretically, occupation should mediate this relationship to a high degree, if not perfectly. Insofar occupations are badly measured, the mediation will diminish.
- It may be important to stress that this validation criterium is not dependent upon the quality of the measurement of education or income, the two other variables in the model. If these (or either one) are badly measured, this will diminish the correlation between education and earnings, but not the degree to which this correlation is mediated by occupational status!
- Table 2 shows the crucial numbers to calculate the mediating role of occupation, as measured by the new ISEI-08 scale. Table 2a ranks the ISSP countries by size of mediation, Table 2b ranks the same data by country. Color denotes the size of the mediating effect, with yellow and green reserved for the higher (good) scores, and orange and red for the lower (bad) scores.
- On average (XNAT), occupations of spouses correlate 0.42; respondent's occupation is strongly correlated with education (0.57), and has a modest effects on income (0.29), with a remaining direct effect of 0.21 for education on income. These numbers are used as benchmark to separate good from bad scores.
- The clear winner in this league of ISSP nations by some distance is Norway. It records a relatively strong correlation between education and income and almost all of it is mediated by occupation. Heya Norway! Straight green scores are also obtained by Cyprus, France, Germany and Argentina.
- If we turn to the bottom of this league of nations, two stand out as very problematic. Venezuela and Russia report unbelievable low effects of occupation on income (below 0.10). The results for Philippines, Dominican Republic and Canada are also discouraging, while Bulgaria displays the odd combination of an extremely strong occupational homogamy pattern but a very minute effect of occupation on income. If we were to believe the Bulgarian results, the conclusion would be that in this country higher educational qualifications are fairly rewarding, but the labor market plays no role in this. One wonders how such a situation can come about. One possibility is that in Bulgaria

(and maybe some other countries with similar results – Slovenia get closest) occupation is coded using educational information, thus creating a bias in the occupation coding.

A general discussion of ISCO-08 and a preliminary version of ISEI-08 constructed using ISSP data can be found on: <http://home.fsw.vu.nl/hbg.ganzeboom/isco08/index.htm>.

## References

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**Figure 1: Elementary income attainment model, without and with representation of occupation via optimal scaling.**

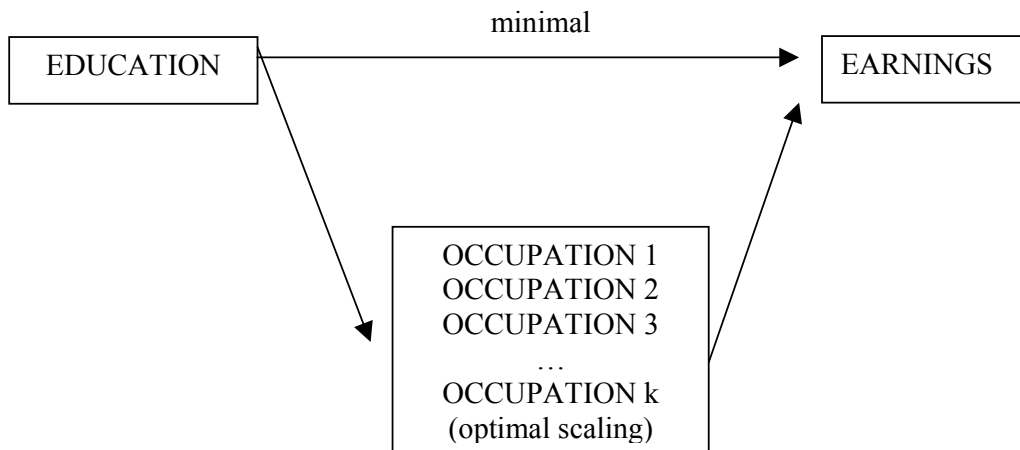
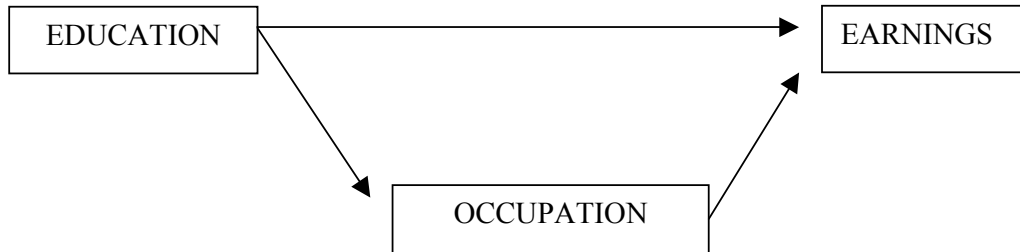
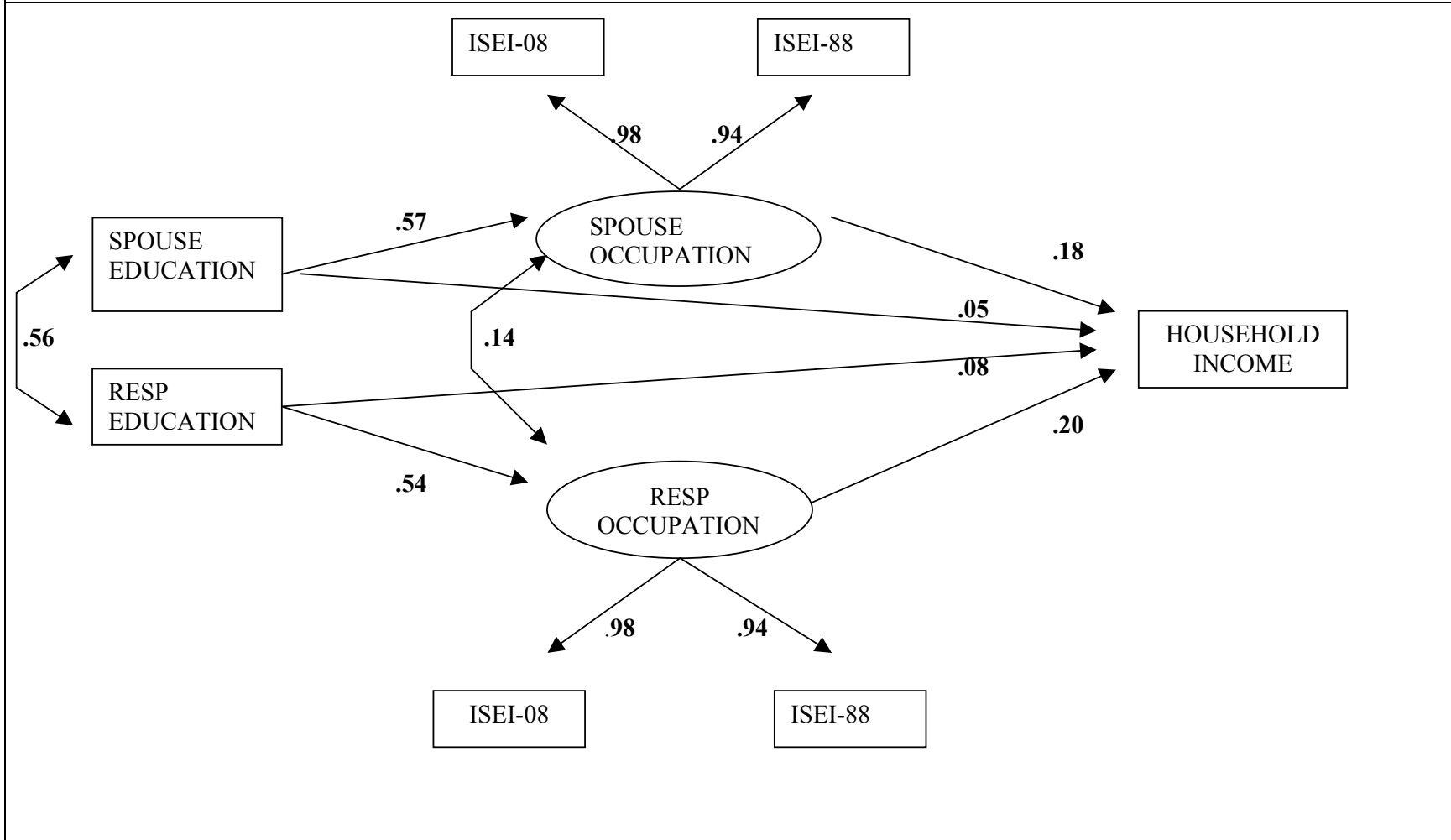




Figure 2: Validation of the ISEI-08 scale on ESS, Round 1 2 3 4



**Table 1: Number of ISCO-88 categories used to code respondent's occupation in each ISSP round**

	year						
	2002	2003	2004	2005	2006	2007	
ARG	0	0	0	0	0	229	
AUS	190	233	222	222	234	250	
AUT	228	219	222	0	0	126	
BEF	202	0	201	196	0	184	
BRA	134	0	134	0	0	0	
BUL	181	195	249	249	0	238	
CAN	0	205	208	48	48	0	Changed!
CHL	164	148	200	0	177	169	
CRO	0	0	0	0	203	203	
CYP	112	0	108	142	0	162	
CZR	244	231	219	213	220	199	
DEN	196	235	176	193	192	0	
DOM	0	0	0	56	146	135	
ENG	202	168	161	179	167	83	
FIN	89	93	91	90	90	743	3 digits
FRA	95	87	93	89	99	99	3 digits
GER	255	235	247	262	266	269	
HUN	204	192	202	214	198	176	
IRE	173	201	203	188	187	225	
ISR	82	181	197	188	188	188	
JAP	153	132	165	147	175	163	
KOR	0	209	200	213	247	226	
LAT	169	168	182	201	176	176	
MEX	165	0	191	199	0	202	
NET	174	0	206	146	157	147	
NIR	148	0	0	0	0	0	
NOR	215	229	215	212	205	186	
NZE	164	172	188	196	204	181	
PHI	81	84	85	163	151	119	Changed
POL	220	209	212	0	206	206	
POR	185	221	221	243	243	0	
RUS	222	301	163	239	303	297	
SAF	0	10	10	9	10	10	1 digit
SLN	205	207	183	173	178	180	
SLO	217	167	208	0	0	224	
SPA	255	172	150	195	214	0	
SWE	184	205	204	203	196	214	
SWI	199	197	242	241	233	233	
TAI	217	241	258	256	249	245	
URU	0	192	197	0	173	193	
USA	180	161	173	193	193	180	
VEN	0	9	9	0	8	0	1 digit

Table 2a: Effects in the elementary income attainment model, by size of indirect effect.

	ISEI $\leftrightarrow$ SISEI	EDUC $\rightarrow$ ISEI	EDUC $\rightarrow$ INC (partial)	ISEI $\rightarrow$ INC (partial)	Indirect effect EDUC $\rightarrow$ ISEI $\rightarrow$ INC
NOR	0.297	0.591	0.015	0.498	95%
SWE	0.360	0.523	0.070	0.435	77%
AUT	0.390	0.588	0.081	0.358	72%
FRA	0.430	0.572	0.113	0.488	71%
GER	0.439	0.655	0.111	0.359	68%
CYP	0.599	0.705	0.136	0.360	65%
JAP	0.351	0.463	0.103	0.419	65%
NIR	0.269	0.640	0.144	0.427	65%
NZE	0.311	0.421	0.070	0.292	64%
NET	0.242	0.541	0.120	0.376	63%
ARG	0.431	0.648	0.155	0.397	62%
DEN	0.360	0.541	0.139	0.413	62%
SWI	0.376	0.648	0.136	0.311	60%
CRO	0.355	0.684	0.219	0.369	54%
URU	0.452	0.648	0.218	0.378	53%
ISR	0.409	0.592	0.151	0.271	52%
POL	0.469	0.679	0.182	0.288	52%
SPA	0.530	0.605	0.204	0.355	51%
CZR	0.327	0.648	0.161	0.229	48%
IRE	0.359	0.558	0.210	0.347	48%
ENG	0.293	0.550	0.223	0.358	47%
CHL	0.454	0.612	0.266	0.364	46%
BRA	0.408	0.538	0.175	0.270	45%
BEF	0.354	0.609	0.200	0.257	44%
TAI	0.567	0.636	0.274	0.340	44%
USA	0.369	0.538	0.189	0.275	44%
XNAT	0.424	0.568	0.211	0.288	44%
AUS	0.342	0.506	0.182	0.275	43%
FIN	0.400	0.576	0.176	0.233	43%
LAT	0.339	0.603	0.194	0.241	43%
POR	0.493	0.669	0.338	0.360	42%
MEX	0.478	0.617	0.292	0.302	39%
HUN	0.428	0.665	0.250	0.225	37%
SAF	0.507	0.616	0.375	0.338	36%
SLN	0.450	0.693	0.332	0.243	34%
KOR	0.486	0.620	0.365	0.280	32%
SLO	0.389	0.614	0.258	0.199	32%
CAN	0.185	0.443	0.242	0.212	28%
DOM	0.317	0.524	0.303	0.213	27%
BUL	0.548	0.751	0.371	0.135	21%
PHI	0.323	0.427	0.358	0.187	18%
RUS	0.287	0.533	0.276	0.093	15%
VEN	0.237	0.431	0.363	0.017	2%

Table 2b: Effects in the elementary income attainment model, by country.

	ISEI $\leftrightarrow$ SISEI	EDUC $\rightarrow$ ISEI	EDUC $\rightarrow$ INC (partial)	ISEI $\rightarrow$ INC (partial)	Indirect effect EDUC $\rightarrow$ ISEI $\rightarrow$ INC
ARG	0.431	0.648	0.155	0.397	62%
AUS	0.342	0.506	0.182	0.275	43%
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VEN	0.237	0.431	0.363	0.017	2%
XNAT	0.424	0.568	0.211	0.288	44%

Harry B.G. Ganzeboom

INTERNATIONAL STANDARD CLASSIFICATION OF OCCUPATIONS

ISCO-08

With ISEI-08 scores

<http://www.ilo.org/public/english/bureau/stat/isco/index.htm>

<http://home.fsw.vu.nl/hbg.ganzeboom/isco08>

Last revised: July 27 2010

Major	sub-major	minor	unit	TITLE	ISEI-08	ISSP-N
<b>0000</b>				<b>Armed forces occupations</b>	<b>53</b>	<b>1207</b>
	0100			Commissioned armed forces officers	65	79
		0110		Commissioned armed forces officers	65	79
	0200			Non-commissioned armed forces officers	53	1090
		0210		Non-commissioned armed forces officers	53	1090
	0300			Armed forces occupations, other ranks	30	38
		0310		Armed forces occupations, other ranks	30	38
<b>1000</b>				<b>Managers</b>	<b>62</b>	<b>14458</b>
	1100			Chief executives, senior officials and legislators	69	2361
		1110		Legislators and senior officials	68	815
			1111	Legislators	66	126
			1112	Senior government officials	70	466
			1113	Traditional chiefs and heads of village	57	91
			1114	Senior officials of special-interest organizations	68	101
		1120		Managing directors and chief executives	70	1546
	1200			Administrative and commercial managers	68	3281
		1210		Business services and administration managers	68	1503
			1211	Finance managers	68	675
			1212	Human resource managers	68	332
			1213	Policy and planning managers	68	
			1219	Business services and administration managers not elsewhere classified	63	70
		1220		Sales, marketing and development managers	68	976
			1221	Sales and marketing managers	66	669
			1222	Advertising and public relations managers	67	158
			1223	Research and development managers	79	149
	1300			Production and specialised services managers	60	5031
		1310		Production managers in agriculture, forestry and fisheries	49	isei68
			1311	Agricultural and forestry production managers	60	
			1312	Aquaculture and fisheries production managers	60	
		1320		Manufacturing, mining, construction, and distribution managers	60	1975

		1321	Manufacturing managers	63	808
		1322	Mining managers	60	
		1323	Construction managers	59	598
		1324	Supply, distribution and related managers	57	569
	1330		Information and communications technology service managers	77	148
	1340		Professional services managers	59	2183
		1341	Child care services managers	59	
		1342	Health services managers	59	
		1343	Aged care services managers	59	
		1344	Social welfare managers	59	
		1345	Education managers	59	
		1346	Financial and insurance services branch managers	59	
		1349	Professional services managers not elsewhere classified	59	2183
	1400		Hospitality, retail and other services managers	53	3477
	1410		Hotel and restaurant managers	43	716
		1411	Hotel managers	43	
		1412	Restaurant managers	47	2007
	1420		Retail and wholesale trade managers	56	253
	1430		Other services managers	59	1008
		1431	Sports, recreation and cultural centre managers	59	
		1439	Services managers not elsewhere classified	59	1008
<b>2000</b>			<b>Professionals</b>	<b>65</b>	<b>32064</b>
	2100		Science and engineering professionals	69	4871
	2110		Physical and earth science professionals	77	344
		2111	Physicists and astronomers	79	29
		2112	Meteorologists	70	6
		2113	Chemists	76	171
		2114	Geologists and geophysicists	80	69
	2120		Mathematicians, actuaries and statisticians	73	92
	2130		Life science professionals	67	363
		2131	Biologists, botanists, zoologists and related professionals	71	129
		2132	Farming, forestry and fisheries advisers	64	169
		2133	Environmental protection professionals	67	
	2140		Engineering professionals (excluding electrotechnology)	72	2389
		2141	Industrial and production engineers	65	isei68
		2142	Civil engineers	76	483
		2143	Environmental engineers	72	
		2144	Mechanical engineers	69	367
		2145	Chemical engineers	71	118
		2146	Mining engineers, metallurgists and related professionals	74	73
		2149	Engineering professionals not elsewhere classified	70	551
	2150		Electrotechnology engineers	74	462
		2151	Electrical engineers	74	256
		2152	Electronics engineers	75	206
		2153	Telecommunications engineers	74	
	2160		Architects, planners, surveyors and designers	60	983
		2161	Building architects	71	349
		2162	Landscape architects	60	

			2163	Product and garment designers	51	540
			2164	Town and traffic planners	60	
			2165	Cartographers and surveyors	67	94
			2166	Graphic and multimedia designers	60	
	2200			Health professionals	66	4030
		2210		Medical doctors	89	850
			2211	Generalist medical practitioners	89	
			2212	Specialist medical practitioners	89	
		2220		Nursing and midwifery professionals	54	1534
			2221	Nursing professionals	42	isei68
			2222	Midwifery professionals	52	isei68
		2230		Traditional and complementary medicine professionals	49	isei88
		2240		Paramedical practitioners	51	isei88
		2250		Veterinarians	71	120
		2260		Other health professionals	66	1135
			2261	Dentists	86	223
			2262	Pharmacists	69	283
			2263	Environmental and occupational health and hygiene professionals	66	
			2264	Physiotherapists	55	388
			2265	Dieticians and nutritionists	53	73
			2266	Audiologists and speech therapists	51	isei88
			2267	Optometrists and ophthalmic opticians	58	isei68
			2269	Health professionals not elsewhere classified	64	168
	2300			Teaching professionals	63	12622
		2310		University and higher education teachers	76	1142
		2320		Vocational education teachers	65	98
		2330		Secondary education teachers	71	3281
		2340		Primary school and early childhood teachers	57	5194
			2341	Primary school teachers	61	3429
			2342	Early childhood educators	47	1339
		2350		Other teaching professionals	56	2308
			2351	Education methods specialists	67	189
			2352	Special needs teachers	58	516
			2353	Other language teachers	54	
			2354	Other music teachers	54	
			2355	Other arts teachers	54	
			2356	Information technology trainers	54	
			2359	Teaching professionals not elsewhere classified	54	1459
	2400			Business and administration professionals	64	3491
		2410		Finance professionals	66	1364
			2411	Accountants	66	1364
			2412	Financial and investment advisers	66	
			2413	Financial analysts	66	
		2420		Administration professionals	59	574
			2421	Management and organization analysts	59	
			2422	Policy administration professionals	62	199
			2423	Personnel and careers professionals	58	375
			2424	Training and staff development professionals	59	
		2430		Sales, marketing and public relations professionals	64	

		2431	Advertising and marketing professionals	64	
		2432	Public relations professionals	64	
		2433	Technical and medical sales professionals (excluding ICT)	64	
		2434	Information and communications technology sales professionals	64	
	2500		Information and communications technology professionals	69	1662
		2510	Software and applications developers and analysts	70	918
		2511	Systems analysts	70	560
		2512	Software developers	70	
		2513	Web and multimedia developers	70	
		2514	Applications programmers	70	
		2519	Software and applications developers and analysts not elsewhere classified	70	
		2520	Database and network professionals	68	185
		2521	Database designers and administrators	68	
		2522	Systems administrators	68	
		2523	Computer network professionals	68	
		2529	Database and network professionals not elsewhere classified	68	185
	2600		Legal, social and cultural professionals	66	4730
		2610	Legal professionals	81	922
		2611	Lawyers	85	491
		2612	Judges	88	46
		2619	Legal professionals not elsewhere classified	72	246
		2620	Librarians, archivists and curators	55	394
		2621	Archivists and curators	55	67
		2622	Librarians and related information professionals	55	246
		2630	Social and religious professionals	65	1848
		2631	Economists	72	500
		2632	Sociologists, anthropologists and related professionals	75	70
		2633	Philosophers, historians and political scientists	76	35
		2634	Psychologists	74	240
		2635	Social work and counselling professionals	59	547
		2636	Religious professionals	53	255
		2640	Authors, journalists and linguists	65	674
		2641	Authors and related writers	65	
		2642	Journalists	65	
		2643	Translators, interpreters and other linguists	68	138
		2650	Creative and performing artists	53	661
		2651	Visual artists	51	208
		2652	Musicians, singers and composers	50	214
		2653	Dancers and choreographers	53	35
		2654	Film, stage and related directors and producers	63	134
		2655	Actors	64	isei68
		2656	Announcers on radio, television and other media	47	49
		2659	Creative and performing artists not elsewhere classified	41	21
	<b>3000</b>		<b>Technicians and associate professionals</b>	<b>51</b>	<b>25797</b>
		3100	Science and engineering associate professionals	51	5510
		3110	Physical and engineering science technicians	52	3953
		3111	Chemical and physical science technicians	49	239



			3112	Civil engineering technicians	55	495
			3113	Electrical engineering technicians	51	351
			3114	Electronics engineering technicians	53	484
			3115	Mechanical engineering technicians	52	446
			3116	Chemical engineering technicians	52	152
			3117	Mining and metallurgical technicians	59	83
			3118	Draughtspersons	49	273
			3119	Physical and engineering science technicians not elsewhere classified	50	740
		3120		Mining, manufacturing and construction supervisors	49	336
			3121	Mining supervisors	49	
			3122	Manufacturing supervisors	49	
			3123	Construction supervisors	49	
		3130		Process control technicians	37	373
			3131	Power production plant operators	41	105
			3132	Incinerator and water treatment plant operators	38	79
			3133	Chemical processing plant controllers	37	
			3134	Petroleum and natural gas refining plant operators	37	
			3135	Metal production process controllers	37	
			3139	Process control technicians not elsewhere classified	35	189
		3140		Life science technicians and related associate professionals	47	249
			3141	Life science technicians (excluding medical)	47	
			3142	Agricultural technicians	48	124
			3143	Forestry technicians	47	
		3150		Ship and aircraft controllers and technicians	59	354
			3151	Ships' engineers	55	50
			3152	Ships' deck officers and pilots	47	116
			3153	Aircraft pilots and related associate professionals	74	73
			3154	Air traffic controllers	67	29
			3155	Air traffic safety electronics technicians	66	24
	3200			Health associate professionals	46	4848
		3210		Medical and pharmaceutical technicians	45	557
			3211	Medical imaging and therapeutic equipment technicians	51	112
			3212	Medical and pathology laboratory technicians	45	287
			3213	Pharmaceutical technicians and assistants	40	158
			3214	Medical and dental prosthetic technicians	45	
		3220		Nursing and midwifery associate professionals	48	2394
			3221	Nursing associate professionals	48	1775
			3222	Midwifery associate professionals	42	80
		3230		Traditional and complementary medicine associate professionals	42	27
		3240		Veterinary technicians and assistants	30	37
		3250		Other health associate professionals	45	1767
			3251	Dental assistants and therapists	43	167
			3252	Medical records and health information technicians	45	
			3253	Community health workers	45	
			3254	Dispensing opticians	48	85
			3255	Physiotherapy technicians and assistants	40	448
			3256	Medical assistants	46	549
			3257	Environmental and occupational health inspectors and	50	290

			associates		
			3258 Ambulance workers	45	
			3259 Health associate professionals not elsewhere classified	45	
	3300		Business and administration associate professionals	53	11919
		3310	Financial and mathematical associate professionals	51	3521
			3311 Securities and finance dealers and brokers	67	258
			3312 Credit and loans officers	51	
			3313 Accounting associate professionals	47	1483
			3314 Statistical, mathematical and related associate professionals	63	61
			3315 Valuers and loss assessors	52	165
		3320	Sales and purchasing agents and brokers	55	3003
			3321 Insurance representatives	57	559
			3322 Commercial sales representatives	55	1788
			3323 Buyers	52	399
			3324 Trade brokers	54	132
		3330	Business services agents	56	909
			3331 Clearing and forwarding agents	54	155
			3332 Conference and event planners	56	
			3333 Employment agents and contractors	55	110
			3334 Real estate agents and property managers	57	399
			3339 Business services agents not elsewhere classified	57	245
		3340	Administrative and specialised secretaries	49	2785
			3341 Office supervisors	57	64
			3342 Legal secretaries	47	969
			3343 Administrative and executive secretaries	49	
			3344 Medical secretaries	49	
		3350	Regulatory government associate professionals	55	1361
			3351 Customs and border inspectors	63	99
			3352 Government tax and excise officials	61	102
			3353 Government social benefits officials	50	87
			3354 Government licensing officials	52	59
			3355 Police inspectors and detectives	54	329
			3359 Regulatory government associate professionals not elsewhere classified	55	339
	3400		Legal, social, cultural and related associate professionals	45	2199
		3410	Legal, social and religious associate professionals	45	1423
			3411 Legal and related associate professionals	52	516
			3412 Social work associate professionals	42	816
			3413 Religious associate professionals	31	91
		3420	Sports and fitness workers	46	229
			3421 Athletes and sports players	46	
			3422 Sports coaches, instructors and officials	46	
			3423 Fitness and recreation instructors and program leaders	46	
		3430	Artistic, cultural and culinary associate professionals	47	547
			3431 Photographers	50	169
			3432 Interior designers and decorators	47	
			3433 Gallery, museum and library technicians	47	
			3434 Chefs	47	
			3435 Other artistic and cultural associate professionals	45	378

	3500			Information and communications technicians	57	944
		3510		Information and communications technology operations and user support technicians	58	789
			3511	Information and communications technology operations technicians	56	199
			3512	Information and communications technology user support technicians	60	325
			3513	Computer network and systems technicians	50	155
			3514	Web technicians	50	94
		3520		Telecommunications and broadcasting technicians	46	isei68
			3521	Broadcasting and audio-visual technicians	46	isei68
			3522	Telecommunications engineering technicians	46	
<b>4000</b>				<b>Clerical support workers</b>	<b>41</b>	<b>21591</b>
	4100			General and keyboard clerks	41	5787
		4110		General office clerks	41	
		4120		Secretaries (general)	42	3566
		4130		Keyboard operators	39	977
			4131	Typists and word processing operators	42	582
			4132	Data entry clerks	36	395
	4200			Customer services clerks	40	3931
		4210		Tellers, money collectors and related clerks	44	1603
			4211	Bank tellers and related clerks	44	694
			4212	Bookmakers, croupiers and related gaming workers	46	81
			4213	Pawnbrokers and money-lenders	70	20
			4214	Debt-collectors and related workers	46	98
		4220		Client information workers	37	2039
			4221	Travel consultants and clerks	42	249
			4222	Contact centre information clerks	37	
			4223	Telephone switchboard operators	34	472
			4224	Hotel receptionists	37	
			4225	Enquiry clerks	37	
			4226	Receptionists (general)	37	1114
			4227	Survey and market research interviewers	37	
			4229	Client information workers not elsewhere classified	37	
	4300			Numerical and material recording clerks	43	5756
		4310		Numerical clerks	47	3266
			4311	Accounting and bookkeeping clerks	45	2076
			4312	Statistical, finance and insurance clerks	52	698
			4313	Payroll clerks	47	
		4320		Material-recording and transport clerks	38	2490
			4321	Stock clerks	36	1364
			4322	Production clerks	41	416
			4323	Transport clerks	41	517
	4400			Other clerical support workers	40	4916
		4410		Other clerical support workers	40	4916
			4411	Library clerks	42	395
			4412	Mail carriers and sorting clerks	32	634
			4413	Coding, proof-reading and related clerks	42	47
			4414	Scribes and related workers	45	96

		4415	Filing and copying clerks	40	
		4416	Personnel clerks	40	
		4419	Clerical support workers not elsewhere classified	40	
<b>5000</b>			<b>Service and sales workers</b>	<b>31</b>	<b>34316</b>
	5100		Personal service workers	30	9995
		5110	Travel attendants, conductors and guides	42	477
		5111	Travel attendants and travel stewards	44	145
		5112	Transport conductors	40	163
		5113	Travel guides	41	90
	5120		Cooks	27	2504
	5130		Waiters and bartenders	29	2433
		5131	Waiters	28	isei68
		5132	Bartenders	30	isei68
	5140		Hairdressers, beauticians and related workers	32	1458
		5141	Hairdressers	32	
		5142	Beauticians and related workers	32	
	5150		Building and housekeeping supervisors	29	2125
		5151	Cleaning and housekeeping supervisors in offices, hotels and other establishments	33	isei68
		5152	Domestic housekeepers	33	534
		5153	Building caretakers	26	910
	5160		Other personal services workers	33	809
		5161	Astrologers, fortune-tellers and related workers	43	20
		5162	Companions and valets	24	112
		5163	Undertakers and embalmers	37	45
		5164	Pet groomers and animal care workers	33	
		5165	Driving instructors	33	
		5169	Personal services workers not elsewhere classified	34	417
	5200		Sales workers	33	14600
		5210	Street and market salespersons	28	1149
		5211	Stall and market salespersons	31	676
		5212	Street food salespersons	23	473
	5220		Shop salespersons	33	11694
		5221	Shop keepers	45	1754
		5222	Shop supervisors	40	
		5223	Shop sales assistants	31	9940
	5230		Cashiers and ticket clerks	31	913
	5240		Other sales workers	35	505
		5241	Fashion and other models	37	127
		5242	Sales demonstrators	41	isei68
		5243	Door to door salespersons	34	378
		5244	Contact centre salespersons	35	
		5245	Service station attendants	17	isei68
		5246	Food service counter attendants	25	
		5249	Sales workers not elsewhere classified	25	
	5300		Personal care workers	26	5989
		5310	Child care workers and teachers' aides	26	1519
		5311	Child care workers	26	1519
		5312	Teachers' aides	38	isei88

		5320		Personal care workers in health services	27	2805
			5321	Health care assistants	28	1726
			5322	Home-based personal care workers	24	679
			5329	Personal care workers in health services not elsewhere classified	26	400
	5400			Protective services workers	40	3081
		5410		Protective services workers	40	3081
			5411	Fire-fighters	49	212
			5412	Police officers	53	734
			5413	Prison guards	49	131
			5414	Security guards	27	968
			5419	Protective services workers not elsewhere classified	38	784
<b>6000</b>				<b>Skilled agricultural, forestry and fishery workers</b>	<b>18</b>	<b>8245</b>
	6100			Market-oriented skilled agricultural workers	18	6911
		6110		Market gardeners and crop growers	18	3090
			6111	Field crop and vegetable growers	16	1548
			6112	Tree and shrub crop growers	21	353
			6113	Gardeners, horticultural and nursery growers	24	376
			6114	Mixed crop growers	14	268
		6120		Animal producers	24	1364
			6121	Livestock and dairy producers	23	934
			6122	Poultry producers	20	84
			6123	Apiarists and sericulturists	29	11
			6129	Animal producers not elsewhere classified	27	171
		6130		Mixed crop and animal producers	18	1845
	6200			Market-oriented skilled forestry, fishery and hunting workers	24	812
		6210		Forestry and related workers	26	486
		6220		Fishery workers, hunters and trappers	21	326
			6221	Aquaculture workers	18	35
			6222	Inland and coastal waters fishery workers	19	150
			6223	Deep-sea fishery workers	35	44
			6224	Hunters and trappers	10	8
	6300			Subsistence farmers, fishers, hunters and gatherers	10	332
		6310		Subsistence crop farmers	10	
		6320		Subsistence livestock farmers	10	
		6330		Subsistence mixed crop and livestock farmers	10	
		6340		Subsistence fishers, hunters, trappers and gatherers	10	
<b>7000</b>				<b>Craft and related trades workers</b>	<b>35</b>	<b>25931</b>
	7100			Building and related trades workers, excluding electricians	34	7455
		7110		Building frame and related trades workers	34	4332
			7111	House builders	40	586
			7112	Bricklayers and related workers	32	isei68
			7113	Stonemasons, stone cutters, splitters and carvers	31	1326
			7114	Concrete placers, concrete finishers and related workers	32	220
			7115	Carpenters and joiners	33	1205
			7119	Building frame and related trades workers not elsewhere classified	35	589
		7120		Building finishers and related trades workers	36	1908
			7121	Roofers	36	137
			7122	Floor layers and tile setters	35	352

			7123	Plasterers	29	236
			7124	Insulation workers	39	72
			7125	Glaziers	33	83
			7126	Plumbers and pipe fitters	38	832
			7127	Air conditioning and refrigeration mechanics	38	
		7130		Painters, building structure cleaners and related trades workers	34	1087
			7131	Painters and related workers	33	828
			7132	Spray painters and varnishers	34	130
			7133	Building structure cleaners	48	36
	7200			Metal, machinery and related trades workers	38	7001
		7210		Sheet and structural metal workers, moulders and welders, and related workers	37	1718
			7211	Metal moulders and coremakers	38	108
			7212	Welders and flamecutters	37	750
			7213	Sheet-metal workers	36	281
			7214	Structural-metal preparers and erectors	38	338
			7215	Riggers and cable splicers	26	18
		7220		Blacksmiths, toolmakers and related trades workers	38	2313
			7221	Blacksmiths, hammersmiths and forging press workers	34	168
			7222	Toolmakers and related workers	40	720
			7223	Metal working machine tool setters and operators	36	983
			7224	Metal polishers, wheel grinders and tool sharpeners	41	284
		7230		Machinery mechanics and repairers	39	2833
			7231	Motor vehicle mechanics and repairers	38	1500
			7232	Aircraft engine mechanics and repairers	54	89
			7233	Agricultural and industrial machinery mechanics and repairers	38	673
			7234	Bicycle and related repairers	26	isei68
	7300			Handicraft and printing workers	33	1956
		7310		Handicraft workers	31	1240
			7311	Precision-instrument makers and repairers	38	240
			7312	Musical instrument makers and tuners	42	15
			7313	Jewellery and precious-metal workers	36	118
			7314	Potters and related workers	29	90
			7315	Glass makers, cutters, grinders and finishers	35	88
			7316	Sign writers, decorative painters, engravers and etchers	30	80
			7317	Handicraft workers in wood, basketry and related materials	33	20
			7318	Handicraft workers in textile, leather and related materials	25	423
			7319	Handicraft workers not elsewhere classified	34	166
		7320		Printing trades workers	36	686
			7321	Pre-press technicians	38	254
			7322	Printers	37	193
			7323	Print finishing and binding workers	34	154
	7400			Electrical and electronic trades workers	43	2848
		7410		Electrical equipment installers and repairers	43	1955
			7411	Building and related electricians	43	859
			7412	Electrical mechanics and fitters	42	857
			7413	Electrical line installers and repairers	43	239
		7420		Electronics and telecommunications installers and repairers	44	509

			7421	Electronics mechanics and servicers	45	321
			7422	Information and communications technology installers and servicers	41	188
	7500			Food processing, wood working, garment and other craft and related trades workers	27	5386
		7510		Food processing and related trades workers	29	1525
			7511	Butchers, fishmongers and related food preparers	29	485
			7512	Bakers, pastry-cooks and confectionery makers	29	729
			7513	Dairy-products makers	34	43
			7514	Fruit, vegetable and related preservers	24	55
			7515	Food and beverage tasters and graders	32	35
			7516	Tobacco preparers and tobacco products makers	10	19
		7520		Wood treaters, cabinet-makers and related trades workers	32	865
			7521	Wood treaters	27	66
			7522	Cabinet-makers and related workers	34	618
			7523	Woodworking-machine tool setters and operators	21	79
		7530		Garment and related trades workers	25	2824
			7531	Tailors, dressmakers, furriers and hatters	24	1074
			7532	Garment and related pattern-makers and cutters	27	105
			7533	Sewing, embroidery and related workers	24	947
			7534	Upholsterers and related workers	29	94
			7535	Pelt dressers, tanners and fellmongers	30	50
			7536	Shoemakers and related workers	27	304
		7540		Other craft and related workers	32	172
			7541	Underwater divers	32	6
			7542	Shotfirers and blasters	49	14
			7543	Product graders and testers (excluding foods and beverages)	32	
			7544	Fumigators and other pest and weed controllers	32	
			7549	Craft and related workers not elsewhere classified	32	
<b>8000</b>				<b>Plant and machine operators, and assemblers</b>	<b>32</b>	<b>15376</b>
	8100			Stationary plant and machine operators	29	6127
		8110		Mining and mineral processing plant operators	39	693
			8111	Miners and quarriers	40	403
			8112	Mineral and stone processing plant operators	39	27
			8113	Well drillers and borers and related workers	46	51
			8114	Cement, stone and other mineral products machine operators	33	88
		8120		Metal processing and finishing plant operators	33	487
			8121	Metal processing plant operators	35	251
			8122	Metal finishing, plating and coating machine operators	31	133
		8130		Chemical and photographic products plant and machine operators	35	516
			8131	Chemical products plant and machine operators	35	425
			8132	Photographic products machine operators	34	65
		8140		Rubber, plastic and paper products machine operators	31	451
			8141	Rubber products machine operators	29	105
			8142	Plastic products machine operators	31	250
			8143	Paper products machine operators	36	69
		8150		Textile, fur and leather products machine operators	21	1300

			8151	Fibre preparing, spinning and winding machine operators	27	158
			8152	Weaving and knitting machine operators	20	209
			8153	Sewing machine operators	18	464
			8154	Bleaching, dyeing and fabric cleaning machine operators	19	164
			8155	Fur and leather preparing machine operators	22	19
			8156	Shoemaking and related machine operators	18	77
			8157	Laundry machine operators	24	isei88
			8159	Textile, fur and leather products machine operators not elsewhere classified	27	92
		8160		Food and related products machine operators	22	716
		8170		Wood processing and papermaking plant operators	29	503
			8171	Pulp and papermaking plant operators	33	108
			8172	Wood processing plant operators	27	190
		8180		Other stationary plant and machine operators	29	1289
			8181	Glass and ceramics plant operators	25	111
			8182	Steam engine and boiler operators	26	142
			8183	Packing, bottling and labelling machine operators	27	isei68
			8189	Stationary plant and machine operators not elsewhere classified	30	1036
	8200			Assemblers	29	1100
		8210		Assemblers	29	1100
			8211	Mechanical machinery assemblers	33	240
			8212	Electrical and electronic equipment assemblers	27	127
			8219	Assemblers not elsewhere classified	28	527
	8300			Drivers and mobile plant operators	36	7381
		8310		Locomotive engine drivers and related workers	44	357
			8311	Locomotive engine drivers	52	155
			8312	Railway brake, signal and switch operators	35	140
		8320		Car, van and motorcycle drivers	36	1753
			8321	Motorcycle drivers	33	188
			8322	Car, taxi and van drivers	36	1565
		8330		Heavy truck and bus drivers	36	3549
			8331	Bus and tram drivers	37	743
			8332	Heavy truck and lorry drivers	36	1832
		8340		Mobile plant operators	31	1482
			8341	Mobile farm and forestry plant operators	22	291
			8342	Earthmoving and related plant operators	35	358
			8343	Crane, hoist and related plant operators	35	341
			8344	Lifting truck operators	29	294
		8350		Ships' deck crews and related workers	44	199
<b>9000</b>				<b>Elementary occupations</b>	<b>20</b>	<b>20003</b>
	9100			Cleaners and helpers	17	7865
		9110		Domestic, hotel and office cleaners and helpers	17	7087
			9111	Domestic cleaners and helpers	17	2353
			9112	Cleaners and helpers in offices, hotels and other establishments	16	3505
		9120		Vehicle, window, laundry and other hand cleaning workers	20	778
			9121	Hand launderers and pressers	19	323
			9122	Vehicle cleaners	20	
			9123	Window cleaners	20	



		9129	Other cleaning workers	20	
	9200		Agricultural, forestry and fishery labourers	14	2463
		9210	Agricultural, forestry and fishery labourers	15	2376
			9211 Crop farm labourers	16	isei68
			9212 Livestock farm labourers	20	isei68
			9213 Mixed crop and livestock farm labourers	18	isei68
			9214 Garden and horticultural labourers	16	isei68
			9215 Forestry labourers	19	195
			9216 Fishery and aquaculture labourers	19	51
	9300		Labourers in mining, construction, manufacturing and transport	24	5641
		9310	Mining and construction labourers	22	1639
			9311 Mining and quarrying labourers	24	43
			9312 Civil engineering labourers	23	608
			9313 Building construction labourers	22	834
		9320	Manufacturing labourers	23	2391
			9321 Hand packers	23	734
			9329 Manufacturing labourers not elsewhere classified	21	408
		9330	Transport and storage labourers	27	1388
			9331 Hand and pedal vehicle drivers	21	55
			9332 Drivers of animal-drawn vehicles and machinery	31	47
			9333 Freight handlers	28	622
			9334 Shelf fillers	20	
	9400		Food preparation assistants	15	
		9410	Food preparation assistants	15	
			9411 Fast food preparers	20	
			9412 Kitchen helpers	10	isei68
	9500		Street and related sales and service workers	25	547
		9510	Street and related service workers	22	102
		9520	Street vendors (excluding food)	26	445
	9600		Refuse workers and other elementary workers	26	1848
		9610	Refuse workers	17	556
			9611 Garbage and recycling collectors	18	148
			9612 Refuse sorters	17	
			9613 Sweepers and related labourers	17	332
		9620	Other elementary workers	29	1292
			9621 Messengers, package deliverers and luggage porters	30	866
			9622 Odd job persons	20	
			9623 Meter readers and vending-machine collectors	34	66
			9624 Water and firewood collectors	20	
			9629 Elementary workers not elsewhere classified	20	