

POLICY INTEGRATION DEPARTMENT

BUREAU OF STATISTICS

Whither the
International
Standard
Classification
of Occupations
(ISCO-88) ?

Debbie Budlender

Integration

WORKING PAPER NO. 9



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Whither the International Standard Classification of Occupations (ISCO-88)?

Working Paper No. 9

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**Policy Integration Department
Bureau of Statistics
International Labour Office
Geneva**

December 2003

Working papers are preliminary documents circulated
to stimulate discussion and obtain comments

Whither the International Standard Classification of Occupations (ISCO-88)?

Contents

	<i>Page</i>
Preface	iii
Acknowledgements	v
Executive Summary	vi
1. Introduction	1
1.1 Background and terms of reference	1
1.2 Methodology	2
1.3 Structure of the report	3
2. Conceptual basis of the classification	4
2.1 Classification criteria: Skills, qualification and education	5
2.1.1. Defining skill level and skill specialisation	5
2.1.2. Interpreting and implementing skill criteria	6
2.1.3. Moving beyond skill level and skill specialisation	7
2.2 Ease of transfer/mobility	9
2.3 Language	10
3. Structure	12
3.1 The shape of the classification	12
3.1.1. How skill level is reflected within the coding structure	12
3.1.2. Number and disaggregation of levels in the hierarchy	12
3.1.3. Use of the most detailed level	13
3.2 Residuals	14
3.3 Gender	15
3.4 Scope and coverage	16
3.5 A matrix approach to presenting the structure of the labour force	17
3.6 Aggregation	18
3.7 Sectors and categories	19
3.7.1. Information technology	19
3.7.2. Managers and supervisors	21
3.7.3. Trainees and apprentices	23
3.7.4. Agriculture	24
3.7.5. Civil service	26
3.7.6. Military	27
3.7.7. Informal sector and informal economy	28
3.7.8. Atypical work	30
3.7.9. Commercial sex workers	31

Contents (continued)

4. Methodology for development, maintenance and updating	32
4.1 ILO work for developing, maintenance and updating ISCO-88	32
4.2 Development, maintenance and updating of national classifications	33
5. Conclusions	35
5.1 Which is the best model?	35
5.2 The role of an international standard classification	37
5.3 One classification fits all?	37
5.4 Providing support	39
5.5 Moving beyond developed and developing	41
5.6 Timing	42
6. Recapitulation of Recommendations	43
References	47

Preface

This report on the *International Standard Classification of Occupations 1988 (ISCO-88)* has been prepared as a background document for the discussion at the 17th International Conference of Labour Statisticians (ICLS) (Geneva 25 November – 3 December 2003) on the International Labour Office's (ILO) future work on occupational classifications.

The history of the development of ISCO has always been closely connected with the work of the ICLS. It was in 1921 that the need for an international standard classification of occupations was initially discussed, but the first positive step towards its establishment was the adoption of a provisional classification of nine major groups by the 7th ICLS in 1949. In 1952 the ILO published the *International Classification of Occupations for Migration and Employment Placement*, based on the national classifications of eight industrialized countries. The first edition of ISCO was published in 1958, and a revised edition followed in 1968. The current version, ISCO-88, was adopted as the *Resolution concerning the revision of the International Standard Classification of Occupations* by the 14th ICLS in November 1987.

The development of ISCO has since the 1958 version followed the same cycle as the United Nations' *International Standard Industrial Classification of All Economic Activities (ISIC)*. Work has started that is expected to lead to a proposal for a revised ISIC in 2007¹. This, together with the fact that it is 15 years since the 14th ICLS adopted the resolution that created ISCO-88, motivated the ILO to seek the advice of the 17th ICLS on the future of ISCO. It was decided that its discussions should be based on the recommendations of an independent consultant's review of national practices with occupational classifications and experiences with ISCO-88.²

To undertake this review, the ILO engaged Ms. Debbie Budlender of the Community Agency for Social Enquiry (CASE), Republic of South Africa. Ms. Budlender was well known as a social researcher with experience from countries in a range of different situations with respect to economic and social development. It was considered an advantage that although she was consulted on the adaptation of ISCO-88 for use in South Africa, she had not been directly involved in the development of the *South African Standard Classification of Occupations (SASCO)*. It was expected that with this background she would apply the perspective of an 'informed outsider'. This report, which presents Ms. Budlender's observations and recommendations concerning ISCO-88 and recent relevant national experiences, demonstrates that this was in fact the case. Her summary of national experiences is presented in INTEGRATION Working Paper No. 10: *Improving occupational classifications as tools for describing labour markets: A summary of recent national experiences*. The work was organized and supervised by Mr. Eivind Hoffmann, ILO Bureau of Statistics. The views expressed are those of the author.

¹ See United Nations: "Statistical Commission: Report of the thirtieth session (1-5 March 1999)", *Economic and Social Council. Official Records 1990, Supplement No. 4. E/1999/24, E/CN.3/1999/29*. (United Nations, New York, 1999), pp. 20-21. At its 34th session (2003) the UNSC requested that a revised ISCO should be available in time to be taken into account for the 2010 round of population censuses.

² In this, the Office followed the example of the preparations for the discussion at the 13th ICLS (1982) of the need to revise ISCO-68. See Thirteenth International Conference of Labour Statisticians: *Report of the Conference* (International Labour Office, Geneva, 1988); and Ehrenström, B.: "The case for a revision of the International Standard Classification of Occupations". *Bulletin of Labour Statistics*, 1983-1. (International Labour Office, Geneva), pp. ix-xxi.

The 17th ICLS recommended The 17th International Conference of Labour Statisticians (ICLS) recommended that the basic principles and structure of the current version of the ISCO-88 should not be revised, but that it was necessary to invest in its updating and overall improvements to reflect important changes that have taken place in the world of work during more than 15 years since it was adopted by the 14th ICLS, and that this work should be concluded early enough for the results to be useful in the preparations that will take place in a majority of countries for the population censuses around 2010. ILO was also requested to have the capacity to provide the technical advisory services on the development and effective use of national occupational classifications.³

The ILO will welcome all comments and suggestions concerning the recommendations made in this report, as well as on other issues related to ILO's work with occupational classifications. Such comments and suggestions should be addressed to The Director, Bureau of Statistics, International Labour Office, CH-1211 Geneva 22, Switzerland, fax. No. + 41 22 799 6957, e-mail: stat@ilo.org

October 2003

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³ See Resolution III from the 17th ICLS and the section on ILO's work with classifications in Chapter 3 "Statistics of Employment", in ILO (2004): *Report of the Conference*. Seventeenth International Conference of Labour Statisticians, Geneva, 24 November – 3 December 2003. ICLS/17/2003/R. International Labour Office, Geneva.

Acknowledgements

This paper would not have been possible without the assistance of many people. It is impossible to name all of them. The informants in the countries Ms. Budlender, the consultant, visited are listed with the national summaries in Working Paper No 10, and thanks are obviously due to them.

In addition to the country sources, this report draws on the vast knowledge of the ILO Bureau of Statistics, in the persons of Eivind Hoffmann and Adriana Mata-Greenwood. Mr. Hoffmann was a particularly important informant as he formed part of the team that developed ISCO-88. Both the ILO and interviewees supplied reports, articles, manuals and other paper and electronic documentation on a range of different national classifications. The consultant obtained further information through personal contacts in other countries.

Margaret Roberts of Canada was a particularly important informant. Her insights are based on experience both in the revision of the national classification of occupations in her home country, and from rendering technical assistance in Korea, Malaysia, the Philippines, Egypt, and Romania. All the countries which she assisted were using ISCO-based classifications, and Ms. Roberts thus brings insights from both the Canadian system and ISCO-88.

Frank Kavanagh of the Employment and Services Affairs Directorate-General of the European Commission provided useful information on the approach to occupational classifications used by the Commission's information system for vacancies (EURES). Andrew Hancock of Statistics New Zealand provided information on the situation in his country.

The consultant also benefited from an extended interview and further interaction with Brian Embury, who was centrally involved in the development of the Australian Standard Classification of Occupations (ASCO), first edition. The ideas he developed in that role were influential in the development of ISCO-88 as well as for national classifications such as those of Canada and the United Kingdom. Mr. Embury was an advisor to the ISCO-88 development team, and has experience in other countries ranging from less developed to very developed.

Executive Summary

Background

1. The resolution to adopt the International Standard Classification of Occupations 1988 (ISCO-88) was passed in November 1987 by the Fourteenth International Conference of Labour Statisticians (ICLS). ISCO-88 is now about 15 years old. In the period since it was developed, there have been many changes in the economies of countries all over the world. We can thus expect that changes of some kind are necessary in ISCO-88 to reflect these developments.
2. The question arises as to how wide-ranging and how 'deep' these changes ought to be. In discussing the route to follow, we can distinguish between three broad paths:
 - *Revision* would entail significant changes to the conceptualisation underlying the classification and/or the structure.
 - *Improvement*, or refinement, might entail some changes to structure, but would not involve significant change to the conceptual basis of the classification.
 - *Updating* would entail more minor changes, primarily at the lower levels of the classification structure.
3. The ICLS planned for November 2003 was asked to advise whether a further full-scale revision of ISCO-88 is necessary, or whether the simpler improvements and/or updates are preferable. To assist with this decision, the ILO's Policy Integration Department commissioned a report presenting arguments for and against different paths. The report was to be based on recent experiences with national occupational classifications in countries where it was known that the issue had been, or was being, seriously considered.
4. Based on empirical observations and discussions during country visits, reading of documents, exploration of the web, and email interaction, The report recommends that the ICLS consider the following strategies for the further development of ISCO. In respect of each recommendation, a reference to the relevant sub-section of the report explains the reasons for the suggestion.

Recommendations

Revision

5. This section contains recommendations as to whether and how the concepts underlying ISCO-88 should be rethought (numbers as in the main text).

Recommendation 28: *The ICLS should request the ILO to improve and update ISCO-88, and not embark on a major revision of the classification. (See section 5.1)*

Recommendation 1: *There is no reason to move away from the skill level and skill specialisation basis of ISCO-88. There is, however, clearly a need for more education of developers and users as to what these concepts mean. (2.1.3)*

Recommendation 2: *The ILO should research the different ways in which countries are capturing additional attributes of jobs beyond skill level and skill specialisation so as to provide guidance as to what is feasible and advisable in this respect for countries with few resources for work on occupational analysis. (2.1.3)*

Recommendation 3: The ILO should research and disseminate information on the differences in the way countries are conceptualising and measuring ease of transfer and mobility between occupations, including the implications for users. (2.2)

Recommendation 12: Developing a matrix approach to the structure of ISCO is not a priority at this stage given that it is likely to involve some disruptive changes to the structural units with relatively limited benefits. (3.5)

Recommendation 14: The ILO should not consider the development of alternate aggregation principles in this round of modification. (3.6)

Recommendation 13: The ILO should investigate the different aggregations being used by employment services in different countries and attempt to come up with a set of standard groupings for different applications. The ILO should also speak to EURES (and any similar projects that might exist elsewhere) to see if their needs can be satisfied. (3.6)

Improvement

6. This section contains recommendations involving changes which do not interfere with the basic conceptual framework, but which might involve some structural changes. The recommendations consider, in particular, whether features introduced in ISCO-88 are working optimally.

Recommendation 4: Serious thought should be given to coming up with titles for the major groups which are less likely to cause difficulties to speakers of different languages, and which indicate more intuitively what the groups contain. (2.3)

Recommendation 6: It is probably not feasible to extend the number of unit groups significantly while retaining international applicability. The ILO should rather expend effort in educating developers and users about the underlying philosophy of the classification, and the importance of developing supporting documentation. (3.1)

Recommendation 11: The ILO should continue to strive to give equal importance and attention to occupations in all segments of the labour force so as to provide a basis on which developers and users can build for their own particular needs and interests. ILO educational material should discuss the advantages of statistical balance, and how this can be achieved when adapting ISCO for national use. (3.4)

Recommendation 9: The ILO should investigate whether it would be useful for ISCO to provide for general categories and whether it is currently forcing a specificity which does not well describe the nature of actual jobs. (3.2)

Recommendation 17: The ILO should survey the operational rules which different countries have developed to distinguish managers from other workers and amend the ISCO-88 rules, definitions and names of categories if there seem to be more workable solutions than the current one. The survey should include investigation as to how the rules are implemented in practice, for example through coding systems.

Recommendation 18: The ILO should consider whether some supervisory categories need to be introduced in ISCO-88. It could be that the perceived developments in the labour market on which these categories were merged with others are not as widespread as previously thought. Further, as one informant pointed out, without separate categories for supervisors, it is impossible to measure the extent of such changes. (3.7.2)

Recommendation 19: Given the relative silence on the topic of trainees and apprentices, there does not appear to be any need for changing ISCO-88's approach. The issue also concerns status in employment rather than occupation. (3.7.3)

Recommendation 23: The ILO should investigate the extent to which jobs that are predominantly found in informal sector activities are being covered in statistical collections and, where they are covered, investigate whether classifications have been adapted to adequately reflect such jobs and/or whether they (including ISCO-88) need to be modified. This work should be given priority as the informal sector is an important component of the economy of many countries, and particularly in countries which are unlikely to have the resources to do much work themselves on occupational classifications. As part of its educational activities, the ILO should attempt to stimulate interest in, and understanding of, the informal sector beyond the few countries which currently participate in the Delhi Group. (3.7.7)

Recommendation 24: The ILO could promote awareness of the problem of atypical work and advise countries how they can better capture information on atypical work situations. Once this has been achieved, monitoring of the results should reveal whether any changes in the occupational classification are necessary. (3.7.8)

Recommendation 20: The wide variation in how agricultural occupations are dealt with in developed countries, the economic importance of the agricultural sector in the developing countries which are most likely to rely on international standards, and the current misfit in terms of ISCO's conceptual framework suggest that their treatment should be re-investigated. In particular, it will be important to obtain information from a range of middle-income and low-income countries as to how they are dealing with occupations in both commercial and non-commercial agriculture. A change in ISCO's structure might then be considered necessary. (3.7.4)

Recommendation 21: The ILO should spend some time investigating how it should and could better cover occupations associated with public administration. (3.7.5)

Recommendation 22: The ILO should again suggest to the ICLS that all jobs in the armed forces not be treated separately, and should develop the arguments as to why the approach to classify jobs there with civilian parallels is preferable. In addition to pointing out that integration is common in many countries, the ILO could point out that integration will facilitate placement of those who are demobilised, as well as recruitment by the military of those employed outside the military. It will thus facilitate better use of the available human resources of a country. (3.7.6)

Recommendation 25: Given the wide range of attitudes to the recognition of commercial sex work, it does not seem likely that consensus will be reached on this issue. The ILO should thus not attempt to introduce a separate unit groups for these workers in ISCO. (3.7.9)

Updating

7. This section contains recommendations which should enable ISCO-88 to provide a better reflection of the current world of work in different types of countries.

Recommendation 30: The ILO should explore the possibilities of establishing electronic networks which would provide it with up-to-date information about changes in the world of work detected by the custodians of national occupational classifications and other experts. (5.1)

Recommendation 7: The ILO should request information from countries using classifications based on ISCO-88 about the type of information that has been coded to the 'not elsewhere classified' groups. (3.2)

Recommendation 10: The ILO should investigate whether the disaggregation used for secretaries in the UK, or in other countries, is relevant and feasible for an international classification. (3.3)

Recommendation 15: Information technology (IT) is an area that the ILO will need to follow up as it is clearly an area in which ISCO-88 will need to be updated. The ILO could help avoid unnecessary duplication of work by others if it draws on the work done in different countries to date and comes up with a suggested standard method of approaching IT occupations. On the education side, the ILO should provide clear documentation of the conceptual issues involved to guide developers of national classifications and users of ISCO-88. (3.7.1)

Recommendation 16: The ILO should investigate how different countries are dealing with call centre work, and come up with best practice in the area. (3.7.1)

Methods to improve national work on, and use of, occupational classifications

8. This section contains recommendations as to how the ILO could promote optimal practice in the development and use of national classifications. The section focuses, in particular, on ways of educating developers and users.

Recommendation 35: In planning the promotion of ISCO and devising strategies to support countries in adopting or adapting ISCO-88, the ILO needs to distinguish different groups of countries and devise strategies that are appropriate to each. (5.5)

Recommendation 31: The ILO should accept that many countries will choose to adopt ISCO rather than adapt it. It should devise its support and development strategies accordingly. It should not encourage adaptation or development of a national classification where there are inadequate resources, as this is likely to result in a sub-optimal and unfinished product. It should rather concentrate on finding ways of helping those who choose to adopt or adapt ISCO to use it optimally. (5.2)

Recommendation 32: The ILO should promote ISCO-88 as a standard for both statistical and employment service uses, and should educate potential users and developers as to the benefits of a single classification. (5.3)

Recommendation 33: The ILO should devote more attention to the employment services uses of ISCO-88. The organisation should attempt, firstly, to assist those who are currently using the classification in developing better systems that utilise the classifications to their full potential. Secondly, the ILO should over time develop expertise and knowledge in this area which can be shared with relevant national agencies through publications, manuals, workshops and advice. (5.3)

Recommendation 26: Work on the manual, website and definitions should be allocated the necessary resources and completed as soon as possible. In the case of the manual, chapters could be published as separate booklets. This would allow for earlier publication of those that are near finalisation, and make the product less intimidating for the user. The ILO should also consider the development of a range of further model tools which could assist users of the classification who have limited resources to develop these from scratch for themselves. (4.1)

Recommendation 5: *The ILO should investigate whether it is possible to come up with standard coding tools in at least the main international languages. These tools could then be further adapted by countries for different language usages as well as other country peculiarities.* (2.3)

Recommendation 8: The ILO's education plan on ISCO should include a focus on 'not elsewhere classified' groups. This should stress ways in which such groups can be misused and ways of avoiding misuse, and how information from residual categories can be used in the development of classifications. (3.2)

Recommendation 27: *The ILO should convene a regular forum of occupation classification experts which would focus on different aspects of development, maintenance and implementation. The forum meetings should take the form of working sessions rather than simply consisting of presentation of conference papers. The meetings should include demonstrations of different solutions. The ILO should document the forums and make the reports available to people working on classifications in other countries.* (4.2)

Recommendation 34: *The ILO should explore how to use workshops and other methods of educating and assisting those responsible for occupational classifications in developing countries in performing their tasks.* (5.4)

Timing

9. The final two recommendations address practical concerns around the timing of ISCO revisions, improvements and timing.

Recommendation 29: *The ILO should plan for future improvements and updating of ISCO to occur on a more regular basis than has been the case in the past.* (5.1)

Recommendation 36: *The ILO should consider whether there is any way of speeding up the development of the new version of ISCO-88, and/or of providing information before it is finalised to countries that want to incorporate new features into the development of their own classifications.* (5.6)

Whither the International Standard Classification of Occupations (ISCO-88)?

1. Introduction

1.1 Background and terms of reference

The resolution to adopt the International Standard Classification of Occupations 1988 (ISCO-88) was passed in November 1987 by the Fourteenth International Conference of Labour Statisticians (ICLS). The resolution to develop a revised ISCO was taken at the previous ICLS, with the intervening years spent in the time-consuming work of effecting this revision.

Hoffmann and Chamie (1999) suggest that revision of a standard statistical classification should be undertaken at 'long intervals', which they specify as 'every 15-20 years', unless there is 'compelling evidence' that an earlier revision is necessary. ISCO-88 is now about 15 years old. In the period since it was developed, there have been many changes in the economies of countries all over the world. We can thus expect that changes of some kind are necessary in the classification to reflect these developments.

The question arises as to how wide-ranging and how 'deep' these changes ought to be. In discussing the route to follow, we can distinguish between three broad paths:

- *Revision* would entail significant changes to the conceptualisation underlying the classification and/or the structure. It would involve some change in the philosophical approach. ISCO-88, for example, entailed a revision to the previous international classification, ISCO-68, by adopting skill level and skill specialisation as the basic similarity criteria used to create the aggregation structure.
- *Improvement*, or refinement, might entail some changes to the structure at higher levels of the classification, but would not involve significant change to the conceptual basis. It would attempt to improve on what the developers originally intended to achieve, taking advantage of a better conceptual understanding developed through experience within the existing philosophy. The British SOC 2000 could probably be classified as an improvement to SOC 90 (see the UK case study in the appendix).
- *Updating* would entail more minor changes, primarily at the lower levels of the classification structure. It would, for example, allow for the addition of new minor or unit groups in ISCO-88, or the introduction of sub-divisions of some unit groups. This level of change involves no changes in philosophy. It focuses primarily on amendments to reflect changes in the world of work that have occurred since the previous revision. The recent work on the *Nomenclature des professions et catégories socioprofessionnelles (PCS)* in France appears to have been more of an updating process than anything else.

The ICLS planned for November 2003 must decide whether a further full-scale revision of ISCO-88 is necessary, or whether the simpler improvements and/or updates are preferable. To assist with this decision, the ILO Secretariat commissioned a report presenting arguments for and against different paths. The report was to be based on recent experiences with national occupational classifications in countries where it was known that the issue had been, or was being, seriously considered.

The terms of reference required a look at:

- recent experiences in developing, updating and revising national standard classifications of occupations (NSCOs); and
- ways in which the classification is being used for the production, presentation and analysis of statistics as well as for the employment services (job placement, vocational guidance and to plan vocational training).

The report was to cover both the work being done in the countries visited, and recommendations on whether, and in which respects, ISCO-88 should be modified.

1.2. Methodology

In the period October 2002 through January 2003 visits were undertaken to Australia, Canada, France, Germany, Netherlands, Sweden, Switzerland, United Kingdom (UK), and the United States of America (US). In each of these countries representatives of the statistical agency, employment services, or both were interviewed. In addition, in the United Kingdom, there was an extended interview with staff of the Institute for Employment Research (IER) at the University of Warwick. This was a key source of information as the IER has conducted research and provided assistance in the area of occupational classification both within the UK and in many other countries, particularly in Europe. A visit to Croatia for other purposes provided the opportunity for an interview with the head of the employment services in that country. An interview with the staff responsible for developing the South African Standard Classification of Occupations (SASCO) was conducted. Brief case studies of each of the countries visited are contained in an appendix to this report. The case studies include the names and institutions of interviewees. In addition to the country informants, a number of experts on occupational classifications were generous in sharing their knowledge. They are named in the acknowledgments.

Finally, the web is becoming a key source of information on occupational classifications. In addition to basic documents on different classifications, the web provides examples of the classification 'in use'. In particular, a growing number of countries have developed web-based job placement systems which allow employers and jobseekers to find each other. Most of these systems make use of some form of occupational classification. The availability of these job-matching systems is one of the most important areas of development since the time when ISCO-88 was developed.

The small number of countries visited, and the fact that they are all at one end of the development spectrum, might appear to be a flimsy basis on which to assess the need for a revision of an international classification. In truth, however, it is primarily – but certainly not exclusively – these well-resourced countries, with their well-developed statistical systems, that have undertaken significant work in developing national occupational classifications. Where poorer developing countries have undertaken the work, it has usually been at the instigation and/or with the assistance of experts from the ILO or developed countries. The documentation from the developing countries consulted in the ILO suggests that the advice, and the direction of development, often follow standard patterns.

ILO writings on the development of occupational classifications repeatedly emphasize the importance of drawing on the knowledge of users, and of those involved 'on-the-ground' in the world of work. The writings suggest a wide range of ways in which this information can be accessed by the custodians and developers of classifications. The interviews conducted revealed the different ways in which this has been done in various countries. In general, most of the interaction clustered around periods of revision.

The ILO suggests that interaction with practitioners and those directly involved is necessary because developers – particularly those in statistical offices – tend to be somewhat removed from the world of work. The organisation further notes that, as an international organisation based in Geneva, it is even further removed than national statistical officers. It is thus heavily dependent on the work done in individual countries for its own understanding of developments in the world of work. This recognition led to the conclusion that, although an international classification will almost certainly be relied on by developing countries more than the developed which have the resources to construct their own, visits to the developed would be fruitful because they have devoted resources to collecting information about what is happening on the ground. Further, because the developed countries have generally developed classifications which differ in significant respects from the international standard, their experiences would offer a broad range of alternatives.

1.3. Structure of the report

The report reflects an attempt to build on empirical observations by starting at the 'bottom' and, on that basis, constructing more general observations. The first sections of the report thus summarize key points related to the experience of countries as reflected in interviews and documents. The experience is discussed in terms of three inter-related aspects:

- Conceptual basis of the classifications;
- Structure of the classifications; and
- Methodology for development and maintenance of the classifications.

In each case the report focuses both on experience in respect of ISCO-88 and on lessons which can be drawn from other classifications.

Most of the sub-sections of the first part of the report end with reflections as to what the discussion means in terms of revision of ISCO. These are supplemented in the final section of the paper with broader reflections and recommendations as to what the ICLS and ILO could do in respect of ISCO-88.

2. Conceptual basis of the classification

An important element in the last revision of ISCO was to develop a stronger, and more clearly stated, conceptual basis for the classification. This was intended to improve the classification's usefulness as a descriptive and analytical tool, as well as to facilitate updating (International Labour Office, 1987, and Hoffmann, 1999).

Nevertheless, those who embark on developing classification systems soon realize that conceptual clarity needs to be tempered by other considerations. Embury et al. (1997:35), for example, note the importance of 'practical considerations such as the framework of national economic and social institutions; the relative significance of particular occupations in the national labour force; data collection possibilities in statistical censuses and surveys; and user demand for statistics on particular categories of occupations.' Several of these considerations would yield different answers when seen from the point of view of a statistician, an economic analyst, and an employment service provider. Yet all of these people – and more – might want to utilize the classification. Embury et al. note further that the structure also needs to have 'intuitive appeal' if it is to be accepted by users. Again, what this means might differ between different users and producers of occupational data.

In many of the countries, informants pointed to the practical problems related to data collection. In particular, they noted that in coding a census they had to rely on what was provided by informants, including proxies, usually without any prompting beyond what was in the written questionnaire. In a census, there is also usually no way of checking back with the informant when the information provided is inadequate. In practice, the census coders are often reliant on a job/occupation title, which may consist of a single word. This word may not provide sufficient detail for coding beyond a broad level. Even worse, it may be too ambiguous to allocate to a single category even at the broad level. UNSD & ILO (2002) provides guidance on question formulation and coding, as does Hoffmann et al. (1995). However, not all statistical offices appear to be utilising this guidance.

In contrast, in at least some job matching situations, the service provider (or the electronic system, if it is sophisticated) can interact with the user until sufficient information is obtained for more exact coding. Somewhere in the middle of these two situations are sample surveys, where fieldworkers – sometimes with the aid of computer-assisted systems – can prompt for further information when this is not initially forthcoming.

The impact of problems arising from the lack of information is raised here as a background to our discussion of conceptual issues because it affects the extent to which a 'pure' conceptual framework is realisable in practice. The discussion below – both in this section and elsewhere – thus repeatedly refers to practical difficulties in implementing the conceptual framework 'neatly', and the modifications which might be necessary to accommodate imperfect information.

However, the impact of the lack of information is not confined to conceptual issues. As the discussion above suggests, the differences in detail available to different applications results in differences in needs of service providers. For general statistical collections and descriptions of the labour force, detailed breakdowns may not be necessary if the higher level groups are relatively balanced in the number of observations which they cover, and if the categories are meaningful to users. Coding should nevertheless be done to the most detailed groups possible because many users of the statistics may not be looking for ‘general statistical descriptions’. For job matching, both the employer and the potential employee need narrower categories if the search process is to be efficient.

2.1. Classification criteria: Skills, qualification and education

One of the key conceptual innovations in ISCO-88 was the specification of skill as the basis for the main similarity criteria used to define higher level categories. In ISCO-88 the first similarity criterion is the skill level, and the second is the skill specialisation needed to carry out the tasks and duties of the job (Hoffmann and Chamie, 1999).

Most informants were happy with ISCO-88’s conceptual framework insofar it is based on skill. Even where countries had not used ISCO-88 as the basis for their classification, many were using similar skill concepts as the basis. However, the concept was not always operationalized in the same way.

2.1.1 Defining skill level and skill specialisation

Skill level focuses on the level of skills and knowledge required for entry into an occupation. In ISCO-88, the levels are defined with reference to the International Standard Classification of Education (ISCED). Several countries in their national classifications have moved beyond the broad ISCED categories to link the skill levels with the particular forms of education and training in the country, as recommended by ILO. This has been a conscious move in both Canada and Australia (see case studies in appendix), with the latter using the Australian Qualifications Framework (AQF) as base. A US informant, on the other hand, reported that while they were strongly attracted to the notion of having skill level as a basis for their classification, they finally decided that their SOC 2000 could not use this concept as they did not have sufficient information on which to base it. They hope that the development of the O*NET occupational information network will, in time, provide the necessary information.

Informants from Canada and Australia suggested that the number of levels in ISCO-88 needed to be expanded from four to five. They felt that the skill level categories identified in ISCO-88 were too broad. The problem with this suggestion is the differences between countries in the level required for entry into particular occupations. Expanding the number of levels would exacerbate the problems which already exist in this respect with ISCO-88.

Skill specialisation in ISCO-88 is defined in terms of the field of knowledge, tools and machinery, materials worked on or with, and goods and services produced. In the Netherlands, the concept of skill specialisation places more emphasis than ISCO-88 on the field of study or qualification. Their approach is facilitated by the strong vocational orientation of the Netherlands classification of education (Embrey et al. 1997: 16).

The concept of skill specialisation, or skill type, allows for more variation than skill level because of the greater variety of ways in which 'type' can be interpreted. Thus even the UK and Australia, which have national classifications with very similar conceptual bases to ISCO-88, have somewhat different major groups (see case studies). Canada and Netherlands, too, have what they call 'skill type' as a conceptual basis for their classifications, but have come up with different categories from ISCO-88 and from each other. The US has skill type alone, without any concept of level, as the basis of its SOC. Its categories provide yet another variant of interpretation of skills type.

From discussions and observation, it does not appear as if any of the skill type categorisations is intrinsically better than another when considered from the perspective of an international classification. Some of the changes are explicitly explained as adaptations to fit particular economies. For example, whether or not there is a separate category for agricultural occupations depends partly on the significance of this sector in the economy. In the countries visited, agriculture is a small, and declining, component of the economy. In terms of both statistical balance and analytical importance, then, it is probably not appropriate to have a separate major group. Other changes reflect attempts to get clearer boundaries for major groups, better statistical balance, or groups which are more intuitively appealing.

Most informants readily acknowledged that their conceptions of skill type would not necessarily be a better basis than ISCO's for an international classification. Indeed, Canadian informants pointed out that Korea, in adapting the Canadian occupational classification matrix, had found it necessary to adapt several of the skill types.

2.1.2 Interpreting and implementing skill criteria

While most informants were happy with the idea of having skill as the base concept for an occupational classification, there were problems in interpreting and implementing it. Two areas of work that seem to cause problems across many countries are teaching and nursing. It is not clear whether these are mentioned often because they constitute large groupings in every country, or because the problems are, in fact, among the most acute. There are probably a range of other occupations where similar difficulties arise, but which, because they are smaller, do not attract as much attention. Indeed, some informants gave examples of such smaller groupings.

The problem in respect of nursing and teaching is, firstly, that the required level of qualification differs across countries and, secondly, that the required level seems to be changing over time in many countries. ISCO-88 caters for the first aspect by providing for teachers and nurses to be classified in both major group 2 and major group 3. Statistics South Africa feels that this still does not solve their problem in that significant numbers of teachers in that country have no teaching qualification and have not completed secondary school. However, in terms of ISCO-88 rules, classification should be decided on the qualifications expected at entry. If South Africa adopted this approach, the problem would disappear. As with some other examples, here it is not the ISCO-88 approach which is at fault, but a misunderstanding by developers and users of the rules.

In respect of the second aspect – the change over time in qualifications – the solution is more difficult. If the change in required qualifications reflects a real change in the tasks and duties performed, then reclassification is clearly justified. If, however, the change reflects 'qualification creep' as the population as a whole becomes increasingly educated, reclassification is not so easily justified if the tasks and duties remain the same and it is simply the shape of the labour supply that has changed. On the other hand, one informant argued that the higher level might have been required in the first place, but suitable people were not available. Further, the same informant argued that employers would tend to utilize the additional skills and knowledge available and the work would thus be performed at a higher level.

Another informant questioned the ‘common wisdom’ in his country that skill levels were ‘dramatically increasing’. He wondered whether using skill as the basis of the classification did not contribute to this perception, in encouraging groups representing different occupations to lobby to ‘move up’ in the classification. He and others noted that such lobbying could reflect both an attempt to increase the status (and thus pay) of a particular occupation, and to restrict access by those who did not have the requisite formal qualifications.

Informants gave several examples of occupations other than nursing and teaching that had been reclassified because of a perception that the required qualifications had changed. In Britain, for example, many of the protective service occupations are now considered more ‘professional’ and have therefore been moved up in the qualification. In Germany, there are cleaners who are classified as associate professionals because they are working with highly toxic chemicals which require qualifications. In Canada, secretaries have been ‘promoted’ to a higher level within the classification. Within ISCO-88 itself, the inclusion of many ‘clerical’ groups within major group 3 can be seen as constituting a similar ‘upgrade’.

As suggested above in respect of South Africa, the nature of ISCO’s link with skills still clearly confuses many users, including many who work in agencies which develop and implement their country’s classification. At the extreme, one informant with experience in several countries said that some developers seemed completely unaware of the skills basis of ISCO-88. The ISCO-88 documentation is clear that the ISCED levels are indicative rather than strict rules. The documentation is clear that the level should be determined on the basis of the entry level for an occupation, rather than the actual levels observed among incumbents at any point in time. It is also clear that qualifications can be obtained both formally and through experience. Yet reports from informants revealed that some users do not look beyond the formal qualifications. Others want to look at the qualifications of the person who occupies the position, rather than the occupation in which they are employed. The focus on formal qualifications can, in part, be explained by the fact that ISCED uses courses and programmes as its main statistical unit and does not cover informal learning.

This misinterpretation is not a problem with the classification itself, but is nonetheless important. One informant suggested that the source of this (and perhaps other problems) is that the ISCO-88 documentation is ‘too precise’. The implication, perhaps, is that the documentation is too concise. The documentation explains clearly what the approach should be, but does so succinctly. The fact that many users are reading in a second or third language means that they could miss out on some of the subtleties.

2.1.3 *Moving beyond skill level and skill specialisation*

In most countries, and especially among employment service users, there is a desire for more information beyond that supplied by the skill type and skill level which are explicit or implicit in most classifications. The French PCS attempts to provide for a wider range by considering a number of different variables. The problem with this approach in terms of conceptualisation is that the system requires a different mix of information in respect of different occupations. Further, the PCS is explicitly designed to match the French social structure, and would not be appropriate for other countries.

Several of the countries visited are attempting to meet the need for information beyond skill type and skill level by developing occupation profiles which include further variables. These are generally developed as elaborations of the classification, rather than changing the classification structure. In the US's Dictionary of Occupations (DOT) occupation profiles were based on the data-person-things framework, which examines occupations in terms of the extent to which incumbents work with information (using intellectual skills), people (using interpersonal skills) and objects (using physical skills). The DOT was poorly maintained in the last decades of the twentieth century and its use is being increasingly superceded in the US. However, the data-persons-things framework lives on in applications in other countries. It is, for example, one of the aspects considered in the Canadian Job Futures system. (See case study). Mauritius, too, is engaged in a long-term project to develop occupational profiles for each occupation in its classification, including the aspect of data-people-things (personal communication from Mr. M. Legrigore, Employment Service).

Among the countries visited, the US and Canada are among the most advanced in coming up with a structured conceptual basis for choosing which elements to collect information on for each occupation. The chosen elements are largely drawn from the discipline of industrial psychology, which has developed a range of frameworks to characterize the different aspects of jobs. Many of these frameworks were available at the time ISCO-88 was developed. The developers of ISCO-88 investigated the advisability and feasibility of incorporating at least some of them in the classification, and the 'data-persons-things' distinction was used when creating the broad specialisation distinctions between the ISCO-88 major groups at 'skill level 2', i.e. major groups 4, 5, 6, 7 and 8. The subsequent development of computer power has, however, provided new opportunities for manipulating multiple elements of data in a way that was not conceivable in the 1980s.

In both the US and Canada, the research efforts required to collect the information are enormous and resource-intensive. Even within these wealthy countries, there are questions as to how well these systems can be maintained to reflect changing conditions and new and emerging occupations. Mauritius is also relatively wealthy, and has a tiny economy to research when compared with the other two. Yet the Mauritius documentation notes that not all elements of their less ambitious occupational profiles have been covered fully because validated test scales and data based on empirical studies within the country are not available.

Most countries will not be able to afford the types of research efforts which have gone into the US and Canadian, or even Mauritian, efforts. From an international standards viewpoint, the number of data-points being collected on each occupation is also probably beyond what most countries can conceivably collect and maintain. The possibility of having more information available on particular occupations, and in a structured format, is nevertheless desirable, especially as computer systems become the norm and employment services increasingly use occupational classifications. Two potential areas of useful investigation are: (a) the extent to which the information collected in a particular country would be applicable internationally, or at least beyond a single country; and (b) the extent to which the number of variables, or data-points, on each occupation could be reduced while still capturing useful information. In terms of (a), the Australian employment services have found – contrary to their expectation – that they have not had to 'Australianize' the information contained in the US's O*NET. However, evidence from a single country is clearly not adequate, especially given the fact that both the US and Australian economies are far more developed than the average country's economy. In terms of (b), it would also be important to clarify the theoretical paradigm which underlies the different variables so that countries are clear about what is being measured.

A further, related aspect which needs investigation is the extent to which the attributes being collected are intrinsic to a particular occupation rather than simply being desirable, or commonly found among current job incumbents or in the available jobs related to that occupation. If the attributes are those of incumbents rather than of the occupation, they should not constitute part of an occupational classification system. Some proposals for additional attributes seem to be going beyond occupational descriptors to descriptors of particular job vacancies, or descriptors of job holders. These should instead be captured as additional variables describing a particular vacancy or individual rather than incorporated in the occupational classification.

Some countries, and particularly those in transition from centrally controlled economies, historically had classifications which described the characteristics of the individual job and job situation in addition to aspects such as skill level and type. Countries with this history sometimes find it difficult in conceptualising a classification which does not include these details. There are, however, both practical and other reasons for avoiding this conflation. Firstly, the inclusion of worker characteristics in the classification could encourage stereotyping and discrimination. It could even, in some countries, be illegal. Secondly, inclusion of further characteristics will tend to lead to a multiplication in the number of occupations or job categories. Thirdly, the characteristics of jobs and workers for a particular occupation might differ between countries. This would make it difficult to develop an international classification.

This is not to say that information about job situations and worker characteristics should not be recorded. Rather, they should be collected as separate items of information in surveys and client-oriented services. Some informants argued that they did not like to give out information on aspects such as the race or gender profile of particular occupations as they feared this might obstruct equal opportunity legislation. It could, however, be equally well argued that provision of such information could provide useful information to job applicants as well as those concerned about equal opportunity as to where apparent barriers need to be broken.

Recommendation 1: *There is no reason to move away from the skill level and skill specialisation basis of ISCO-88. There is, however, clearly a need for more education of developers and users as to what these concepts mean.*

Recommendation 2: *The ILO should research the different ways in which countries are capturing additional attributes beyond skill level and skill specialisation so as to provide guidance as to what is feasible and advisable in this respect for countries with few resources for work on occupational analysis.*

2.2 Ease of transfer/mobility

For job placement, users require information about the ease of transfer between different occupations. Some measure of ease of transferability is also important for other purposes. In a national emergency, evidence about the ease with which people can be moved into new jobs will assist in responding to the crisis. In non-emergency times, information on transferability can assist in mid- and longer-term labour market and vocational training planning. Information on transferability is increasingly desirable as the likelihood of an individual remaining within one occupation, or even with a single employer, throughout their working life becomes rarer.

In developing the first version of ASCO, the project team saw a close link between the skill base of the proposed structure and potential transferability. Their aim was to group occupations in such a way that a person could move between occupations in a particular unit group without significant retraining, and would need some retraining to move between occupations in different groups. Further, the greater the 'distance' between unit groups within the classification, the greater would be the additional training required (Embry, 1991).

Like ASCO, ISCO-88 is designed to show the potential of transfer both horizontally (across skill specialisations, but at the same level) and vertically (upwards in skill level within a specialisation). However, the ISCO-88 material acknowledges that the level of generality at which ease of transfer is reflected is usually not specific enough for job placement and careers advice purposes. Further, and also like ASCO, ISCO-88 reflects potential rather than actual mobility. It does not, for example, take account of institutional and social barriers which might prevent this potential being realized. Those responsible for employment services might be more interested in actual, observed ease of transfer than of potential when advising clients. Information on actual mobility could be a feature of an occupational dictionary rather than the classification structure.

The ASCO and ISCO-88 indications of ease of transfer operate at a very broad level. There are several examples of countries which have developed approaches which reflect ease of transfer in a more disaggregated way. Hoffmann (1998) notes that the German system of vocational guidance, the French ROME and Swedish WAP 2000 systems developed conceptual and visual bases for job matching which grouped occupations into clusters in which ease of transfer of skills should be easier. Informants in the Netherlands described how they had contracted experts to manually develop scores which provided a measure of mobility between pairs of occupations. Their long-term goal is to develop an automated way of doing such scoring. One of the principles of the Canadian NOC is similar to ASCO and ISCO-88 in stating that mobility between occupations within a unit group should be greater than mobility to any other unit group. The difference from ASCO and ISCO-88 is that the way the skill types are defined allows the Canadian matrix to illustrate paths of occupational mobility. In the US, the developing O*NET system provides a range of ways of scoring attributes of individuals and occupations which produce indicators of ease of mobility between occupations, or of individuals with particular skills and knowledge into occupations.

From the research conducted, it was unfortunately not clear to what extent the ways of measuring ease of transfer and mobility are similar across countries and systems. It seems likely, however, that there are significant differences between them both in conceptualisation and in ease and clarity of what the conceptualisation means for implementation.

Recommendation 3: *The ILO should research and disseminate information on the differences in the way countries are conceptualising and measuring ease of transfer and mobility, including the implications for users.*

2.3 Language

At first glance it might seem odd to include a discussion of language under conceptual aspects rather than, for example, under utilisation. The research suggested, however, that language often caused conceptual problems. Hoffmann and Chamie (1999) implicitly support this contention when they note that translations of a standard classification should focus on concepts, rather than words, and may sometimes require the creation of new terms in the target language.

ISCO-88 was developed in English, but has been translated into, and is used in, many languages. Informants with experience of usage in languages other than English said that the translations were often not optimal, in that the translator responsible did not have a good understanding of the conceptual basis of ISCO-88 and/or the occupational setup in the user countries. There were also some more basic weaknesses. In the Spanish translation, all occupations were translated into the male version. Further, the major group for 'elementary' occupations was translated into Spanish as 'unskilled' occupations, a term that the developers explicitly avoided in the English version.

In fact, a good translator would need to have a good understanding of the occupational setup in Anglophone countries to understand the way words are used there to describe occupations and jobs. Further, there is sometimes not a single understanding of the same terms even in Anglophone countries.

Problems with ISCO translations were mentioned most often in relation to major groups 1 through 3. In respect of major groups 2 and 3, the titles of the groups themselves cause misunderstandings. The word 'professional' in English implies a particular level of formal qualifications, status and even career path. In French the seeming equivalent does not necessarily have the same implication as the French word 'profession' equates more commonly with the English 'occupation'.

The differences in understanding are not confined to English and French. In the documentation for the European Union's Technical Assistance with the Classification of Occupations (TACO) project and elsewhere, members of major group 2 are variously referred to as 'experts' and 'specialists'. These terms would have a different meaning for a British person. At a more detailed level, a 'professor' in the United States would be a 'lecturer' in many other countries. Similarly, an English 'engineer' would have a four- or five-year university degree, while this term would be applied in other countries to people who in England would be seen as 'mechanics'.

The term 'associate' used for major group 3 is almost always confusing to most people when they first encounter it. However, the Australian attempt to introduce the alternative 'paraprofessional' resulted in complaints that it implied inferior status.

At least some of these difficulties might be solved by a simple recasting of the names of the major groups – and perhaps lower-level groups – so that they become both more internationally understandable and more 'intuitive'. Unfortunately, none of the informants had suggestions as to better titles.

Recommendation 4: *Serious thought should be given to coming up with titles for the major groups which are less likely to cause difficulties to speakers of different languages, and which indicate more intuitively what the groups contain.*

A more intractable issue is that differences in language usage between countries means that classification tools such as coding indexes and automatic and assisted coding systems developed in one country cannot easily be used in another country without some – often quite significant – adaptation. A corollary is that it is difficult to develop standard versions of the tools and instruments which are a necessary part of a working classification. However, unless some models of such standard tools are made available, many countries will continue to use classifications sub-optimally.

Recommendation 5: *The ILO should investigate whether it is possible to come up with standard tools in at least the main international languages. These tools could then be further adapted by countries for different language usages as well as other country peculiarities.*

3. Structure

3.1 The shape of the classification

3.1.1 How skill level is reflected within the coding structure

ISCO-88 takes the form of a pyramid, with ten major groups at the top level of aggregation, 28 sub-major groups, 116 minor groups, and 390 unit groups. The major group is identified by the first digit, and each level of subsequent disaggregation is indicated by the addition of a further digit. The unit group is thus represented by a four-digit code.

The first digit of the ISCO-88 code does not indicate the skill level in a simple way as there are four, rather than ten, skill levels. There are thus several major groups which all represent skill level 2, and two major groups which are not linked to any single skill level. One result of this feature of the code is that many users might not recognize the way in which skill level is reflected in the structure. Another result could be excessive clustering in a single skill level in that just over a third (34%, or 37% if one excludes the major groups with no skill level link) of unit groups are at the 2nd ISCO skill level. However whether the clustering, in fact, occurs will depend on the shape of a particular country's labour force and how many jobs are classified in these unit groups.

The Netherlands national classification is better than ISCO-88 in terms of clearly reflecting level in that each combination of the first two digits represents a different level. However, while changing ISCO in this respect would not be difficult conceptually, it would result in significant knock-on effects for countries using ISCO-based classifications because of changes in length of codes, coding systems, and so on. The benefits in clarity of the structure would thus need to be weighed against the costs.

3.1.2 Number and disaggregation of levels in the hierarchy

An aspect of the classification that evoked some discussion in interviews was the number of levels in the structure and the number of categories defined at each level of the hierarchy. As noted above, ISCO-88 provides for four levels, with the bottom level composed of 'unit groups'. Many of the more recent 'revisions' of national classifications – whether ISCO-based or not – have focused on the more detailed levels of the codes. In fact, many adaptations of ISCO-88 for national purposes appear to involve little more than extension of the unit group code to five or more digits to provide for a range of 'occupations' within each unit group. In some cases, developers appear to have simply taken the example job titles provided in ISCO-88 for the different occupations and assigned a longer code to each.

One motivation for adding further digits is that at this level of coding developers can make adaptations which suit the shape of their national economies. In particular, it is at this level that they can add codes for particular culturally-linked occupations and for particular job titles in use in the country, as well as achieve some sort of statistical balance in the size of categories. The latter is clearly not possible in an international classification given the differences between national economies.

Another motivation for extending the code structure is to provide for better job matching. Employment services in many countries feel that a match on four-digit codes gives employment services advisers, employers and job seekers too many possibilities to sift through. In South Africa, those involved in the skills development strategy want more detail than provided by the five-digit national classification so as to fit in with the system of sectoral education and training authorities. (See case study). However, it seems that those responsible for implementation of the skills development strategy might now be realising that this is not as feasible as they thought.

No significant problems were raised in respect of extending codes. However, one informant with experience in assisting other countries suggested that many were expending unnecessary effort on this task. She suggested that an increase in the number of ISCO-88 unit groups to between 500 and 1,000, combined with education of country developers, might convince countries to abandon the idea of developing several thousand occupational titles. The informant stressed that the development of definitions for all groups at the lowest level is necessary if a classification is to be used effectively. However, at present she felt that many countries do not have the resources or energy to undertake the task, and perhaps do not recognize the importance of doing so. An expansion in the number of unit groups within ISCO-88 would obviate the need for each country to develop a large number of definitions.

The feasibility of increasing the number of unit groups in ISCO-88 would need to be investigated. It was clearly stated at the time of ISCO-88's development that the classification presented fewer detailed categories than its predecessors because of the difficulty of providing detailed distinction in a way that would be applicable internationally. The developers were fully aware that each of the 390 unit groups encapsulated a number of more detailed occupations. However, they were also wary of adding unit groups if the vast majority of jobs would be classified to a small proportion of the available occupations.

3.1.3 Use of the most detailed level

Most statistical agencies code to around four or five digits in large surveys and in population censuses, but often produce standard reports at a much more aggregated level. The ILO recommends coding to as detailed a level as supported by the information provided as a means of enhancing accuracy of coding and flexibility of tabulations, even if reports are produced at an aggregated level. This recommendation rests on the recognition that the 'level' in the aggregation structure does not necessarily correspond to the numerical size of a group, as well as on an assumption that occupation becomes less theoretical and more 'real-life' the lower down one goes in the classification. Several of the agencies said that, while they did not report to the lowest level of detail, coding at this level encouraged greater accuracy.

In Canada the groupings of occupations in the national statistical classification (NOC-S) and employment services classification (NOC 2000) differ, but the unit groups are the same. Here classification to the unit group level allows the employment services to use data collected by Statistics Canada in their applications. In Australia, where the possibility of constructing 'alternate views' (see below, as well as case study) is being considered, there is a question as to whether this will require the 6-digit (occupation) level to be the building block.

Overall, limited information could be obtained on the extent to which the more detailed codes are used, and by whom. Several countries said that more detailed data was available on request to the public. The ILO has itself responded to a request of this type by creating and making available its SEGREGAT database, which provides sex-disaggregated data for different countries at the four-digit level. One concern in disseminating more detailed data is that some users might be using information about very specific occupations where the survey concerned is not of sufficient size to produce reliable information at this level.

Recommendation 6: *It is probably not feasible to extend the number of unit groups significantly while retaining international applicability. The ILO should rather expend effort in educating developers and users about the underlying philosophy of the classification, and the importance of developing supporting documentation.*

3.2 Residuals

ISCO-88 provides residual categories which cover occupations ‘not elsewhere specified’ (nec). At the unit group level, the codes for these residual categories end with the digit 9. Most other classification provide in similar ways for residual occupations.

Residual categories are a problem in statistical applications as they are sometimes used as a catch-all in cases where there is insufficient information to classify an occupation in detail. This usage is incorrect, as some of the cases so classified should, in truth, be classified in one of the specified categories. Residual categories are even more of a problem for employment service providers as matching of unspecified jobs or job-seekers is unlikely to result in a good match.

While residuals are a problem for users, they can be useful to the developers of classifications. Several countries spoke of how they examined residual categories which were used for more than a small proportion of cases to uncover new and emerging occupations which should be added to the classification, as well as cases in which the classification included categories on which it is difficult to collect information and the residual is thus used as a catch-all.

Recommendation 7: *The ILO should request information from countries using classifications based on ISCO-88 about the type of information that has been coded to the residuals.*

Recommendation 8: *The ILO’s education plan on ISCO should include a focus on residuals. This should stress ways in which residuals can be misused and ways of avoiding misuse, and how information from residual categories can be used in the development of classifications.*

An issue sometimes confused with residuals is that of general categories. The latter are categories which are less specialized than the degree of specialisation provided for at that level of the classification. The (inappropriate) use of the residual classification as a catch-all for inadequately specified data reflects this confusion.

ISCO-88 does not at present provide for general categories. Instead, it has a prioritisation rule which states that an occupation which covers more than one category of the classification should be classified in the category which represents the higher skill or, where more than one of the components is at the highest skill level, that which accounts for the longer time.

From the documentation, it seems that the area of general categories is one of the common forms of deviation from the standard in classifications based on ISCO-88. Often this occurs beyond the four-digit level, where the extra digit/s will have a general category which covers occupations which cover several fields. However, it can also be provided for at higher levels of a classification.

The literature notes that the likelihood of occupations being general depends, among others, on the size of establishments and thus the degree of specialisation, as well as on the degree of multi-skilling in the workforce. In Australia, those responsible for developing ASCO provided for general categories in recognition of increased multi-skilling under the country's approach to qualifications. In ASCO, where a job's title or range of tasks suggests that it covers two or more occupations in the classification, the job is coded at a higher level of the structure which includes all the component occupations.

Recommendation 9: *The ILO should investigate whether it would be useful for ISCO to provide for general categories and whether it is currently forcing a specificity which does not well describe the nature of actual jobs.*

3.3 Gender

One of the aims of the revision of ISCO which resulted in ISCO-88 was to provide a better reflection of women's position in the labour market (Hoffmann, 1999). In particular, the ILO tried to address the much greater disaggregation of male-dominated occupations when compared with female-dominated occupations.

Where national classifications are not based on ISCO, they will probably have even more gender bias than ISCO-88. This bias is especially likely where the classifications draw on the vocational training and collective bargaining systems. These national classifications will not be a useful source of learning on gender bias unless conscious thought has been given to the issue. In the interviews, some informants rejected any notion that their classifications could incorporate gender bias without this having been explicitly introduced. These informants denied that this had happened with their classifications.

On the other hand, informants in most countries which had revised their national classification reported that the new classifications placed less emphasis on blue-collar industrial occupations, and more emphasis on distinguishing service occupations. To the extent that the former are more male-dominated and the latter more female-dominated, this shift of emphasis might implicitly bring with it greater gender balance. However, the higher level of unionisation in manufacturing industries than in clerical work and services in most countries has meant that, historically, the social partners have generally agreed to a greater delineation of different types of jobs in manufacturing. This has created a bias whereby manufacturing occupations tend to be disaggregated to a greater degree than occupations in other areas of work.

A few informants mentioned ways in which they had consciously taken the ILO's work in respect of gender balance further. Others spoke of the difficulties they encountered in doing so. One common area of concern is the single category for secretaries. Britain's SOC 2000 has addressed this by developing a five-way disaggregation of this category. In Canada, the NOC distinguishes between medical, legal and 'other' secretaries. The latter distinction is easily implemented in Canada because of the way in which the education and regulation of medical and legal secretaries is effected. The distinction would not necessarily work in other countries.

In South Africa, the developers of the national adaptation of ISCO-88 introduced a new occupation in major group 9 to cater for household gardeners. Previously this occupation had been classified in major group 6. The shift was made to avoid the gendered inconsistency whereby gardeners were regarded as skilled workers, while their largely female counterpart domestic workers were regarded as elementary workers.

Recommendation 10: *The ILO should investigate whether the disaggregation used for secretaries in the United Kingdom, or in other countries, is relevant and feasible for an international classification.*

3.4 Scope and coverage

ISCO-88 was intended to cover the full potential world of work in all countries of the world. It was this desire to provide full coverage, and to do so on a more or less 'equal' basis, that prompted strategies such as a decrease in disaggregation for industrial occupations, and investigations as to how the informal sector could be covered. The decrease in disaggregation for industrial occupations was also prompted by the relative decrease in the number of jobs in this area in developed countries with the advent of automation and computer-controlled production lines.

ILO guidelines for constructing national classifications point to the desirability for statistical balance where classifications are used for statistical purposes. Statistical balance is achieved when, at each level of the structure, no category deviates too far from the average at the same level in the number of incumbents covered. Such balance is clearly not possible in an international standard. However, by covering all possible areas of work, and by attempting to reflect changes in the world of work, ISCO-88 attempts to provide the basis from which countries can derive balance for their country by combining, discarding and disaggregating particular groupings.

Informants in several countries described their own desire to achieve statistical balance. The US approach appears to be different from most others in this respect. The documentation which was produced during the revision process which resulted in the US's SOC 2000 notes that statistical balance should not be an overriding factor. Further, several informants said that in developing and using the classification, they tended to focus on the more prestigious and better-paid occupations. They did so because these represented the direction in which government hoped the economy would develop, and reflected the occupations to which ordinary people aspired. At the opposite extreme in terms of concern with statistical balance, Australia has with each revision developed guidelines in terms of the minimum size of groups for each level of the occupation, as well as percentages beyond which major groups should not deviate from the average. Australia will, however, face a challenge in this respect as it participates in the development of the Australian and New Zealand Standard Classification of Occupations (ANZSCO) as the two countries differ in terms of both the absolute size and the nature of their economies.

Users of a classification may, of course, not want or need the full world of work to be covered. For example, in most countries public employment services tend to serve lower- and medium-skilled jobs and people. More highly skilled jobs and people are catered for either by private employment services or by other means.

UK research which informed the development of their SOC 2000 gives some idea of this bias. (Information supplied by Peter Elias, IER.) The research found that only 8% of vacancies notified to the public employment services were classified to major groups 1, 2 and 3. In contrast, placements were concentrated in major group 6 (personal and protective service occupations) and major group 9 (other occupations), each of which accounted for about 20% of the total. The 8% for major groups 1, 2 and 3 can be contrasted with the distribution of the total UK labour force in 1996/7, where legislators

and managers account for 15%, professionals for 15% and technicians for 9%. The vacancy data are flow data, and are affected by differences in average job tenure across groups of occupations. However, the differences are large enough to suggest that this fact cannot explain the full gap. A further indicator of concentration in usage is that almost half of all vacancies received by the UK public employment services were coded to just 10 of the 371 unit groups in SOC90. While some of this clustering might be attributable to weaknesses in coding, again the statistics are too stark to be explained by this single factor.

Statistical applications may also have biases. Establishment surveys, for example, will usually cover the formal sector, and usually exclude agriculture. Household surveys should cover persons employed in the informal sector, but will not perform well in capturing occupations common to people living on the street or in institutions not covered in the survey. The phrasing of the questions about employment will also determine how well the more informal and irregular forms of income-earning are covered.

In some countries, there may be localities which are not covered in surveys and censuses, for example territories set aside for indigenous people. This will usually imply a bias in the range of occupations covered. The ILO itself collects information on an annual basis for its October inquiry, which focuses only on specified occupations, and at different levels of detail. For this inquiry, the occupations chosen are occupations that fall within the scope of ILO Industrial Committees and similar bodies, that can be expected to be reasonably similar in different countries, and that are important in terms of employment of certain types of workers, such as women or salaried employees.

Where those responsible for exercises with incomplete coverage are responsible for developing a classification, they may have little interest in developing the classification in respect of un- and under-covered occupations. These biases cannot, however, inform the structure of an international classification which should be suitable for all uses.

Recommendation 11: *The ILO should continue to strive to give equal importance and attention to occupations in all segments of the labour force so as to provide a basis on which developers and users can build for their own particular needs and interests. ILO educational material should discuss the advantages of statistical balance, and how this can be achieved when adapting ISCO for national use.*

3.5 A matrix approach to presenting the structure of the labour force

Several Canadian informants noted that colleagues in other countries liked their matrix approach to the classification, rather than a linear, if hierarchical, listing as in ISCO-88 and most other classifications. In particular, the matrix provides a visual picture of the classification which might be more readily grasped by many users.

One challenge in adopting this approach for the international classification is that the Canadian matrix is, in fact, valid for the employment services variant of the NOC, but does not work well for the statistics variant. As the majority of users of ISCO-88 at this stage are probably on the statistical side, particularly in developing countries, this challenge would need to be thought through carefully before ISCO was adapted in this way.

A further limitation of the matrix approach is that it can only show two dimensions in a visually clear manner. A hierarchical approach is not limited in this way.

Recommendation 12: *Developing a matrix approach to ISCO is not a priority at this stage given that it is likely to involve some disruptive changes to the structural units with relatively limited benefits.*

3.6 Aggregation

As noted above, ISCO-88's structure provides for unit groups, minor group, sub-major groups and major groups, and many countries develop further level/s of occupations beneath the unit groups. Successively higher levels of the classification are intended to reduce the complexity further through the use of ever broader categories.

While ISCO-88's grouping are generally conceptually sound, informants reported complaints from users. Many of these complaints focus on group titles that lack intuitive appeal, particularly at the major group level. As noted above, the 'associate professional' group is particularly difficult, but there are also misunderstandings of the intended scope of other groups, such as managers. Linguistic issues aggravate the problem. For statistical reporting purposes, there is also a debate between those who favour short, indicative titles which fit neatly into tabulations, or longer, more technical titles which describe more accurately, but also more clumsily, what is contained in a group. It is sometimes difficult to distinguish where complaints such as those described here arise because the major groups are themselves not intuitively appealing, and where they arise because the titles chosen for the groups are not appealing to users. These two causes suggest different solutions.

Employment services have sometimes developed different aggregations which those responsible claim are more 'intuitive' for those who use their systems. Similarly, printed guidance material is usually sorted into broad 'activity areas' reflecting types of products or services produced i.e. a pseudo-industry approach.

In the interviews, informants were usually not able to provide a clear conceptual basis for the alternative groupings which they had developed. In fact, several acknowledged that they were 'pragmatic' or 'ad hoc'. Alternatively, they said that the groupings reflected 'how people think about jobs'. Unfortunately, the variety of categories chosen suggest either that people in different countries think about jobs in very different ways, or that these more 'intuitive' categories do not have a solid conceptual basis.

Shifting to a classification with a more rigorous conceptual basis will encounter resistance in that people are generally more comfortable working with categories that they are used to. Nevertheless, as globalisation proceeds, there could be increasing advantages to finding common ways of dealing with job matching, particularly within the regional geographical groupings. One indication of such interest is that the European Commission is operating European Employment Services (EURES), a European job vacancy exchange system. It includes a web-site and links together the public employment services of the EEA member states. The present system, which was launched in 1996, currently uses an unmodified version of ISCO-88. EURES has also supported CV-search, a partial job matching system developed by the Swedish employment services. CV-search also uses ISCO-88. By October 2002, CV-search had been developed for four area of work - ICT, healthcare, hotel and catering, air travel, and recorded 42,712 CV's and records of 1,108 employers. It was expected that all occupations would be covered by April 2003.

A EURES working party was established in 1998 to look at possible modifications of ISCO-88 for EURES' purposes. One option was to come up with a completely new classification system to replace ISCO-88. This was discarded as being too ambitious and involving too much work. Instead, the group developed an adaptation of ISCO-88 by adding a fifth digit as well as some new four-digit codes. In 2003, the adaptation is to be implemented in the central database, but the full ISCO-88 will be retained when some new codes are added in accordance with the wishes of the working group. The revised version has been made available to the public employment services, the EURES' partners, so that they could make local decisions on whether to use it when sending information about vacancies to the central EURES data base. EURES is currently

investigating the potential for developing common extensible mark-up language (.xml) standards for vacancies which could allow easier electronic transfer of vacancy information in a common format between the many stakeholders in the labour market.

Recommendation 13: *The ILO should investigate the different aggregations being used by employment services in different countries and attempt to come up with a set of standard groupings for different applications. The ILO should also consult with EURES (and any similar projects that might exist elsewhere) to explore collaboration.*

In the consultation process around the development of ANZSCO, the developers in the two countries have been asked by some users to develop ‘alternate’ views. These calls come mainly from specific users, such as the IT industry, building and construction, culture and leisure. The developers have undertaken to investigate the possibility of developing more than one way of aggregating the unit groups or occupations so as to provide the alternate views. At this stage they do not have a solution as to how to develop an alternative view that includes all groupings at the lowest level and allocates them to a single higher level group without moving away from defining the lowest level in terms of skill specialisation and skill level. One or two informants suggested that the task was not, in fact, possible.

Recommendation 14: *The ILO should not consider the development of alternate aggregation principles in this round of modification.*

3.7 Sectors and categories

This sub-section focuses on particular sectors and categories which were mentioned repeatedly during interviews as causing problems. The discussion is far from comprehensive, in that it was not possible to canvas informants for their opinions on all sectors. Instead, the focus was on issues that informants raised spontaneously as well as a few categories in which problems were anticipated based upon reading and experience.

3.7.1 Information technology

Virtually all countries that have revised classifications recently named the information technology (IT) sector as one of the reasons that a revision was needed, and/or as a sector where revisions proved difficult. Users were often reported to be particularly vocal about the inadequacies of existing classifications in dealing with occupations in the sector. Some of these user complaints emanate from the IT sector itself. Others come from employment services. In the latter case, the problems are probably magnified by the relatively high rates of labour turnover in the sector.

In discussion, most informants agreed that one needs to distinguish between occupations which use computers as a tool, and those where incumbents are involved in developing, maintaining or otherwise working directly with IT systems. The first group should not need special occupational groups to indicate that they use computers. In effect, if computer use was built into the definition of occupations, the classification would implicitly be privileging one aspect of skill specialisation (tools and materials) or goods and service (IT) above others. The second group of occupations – those working directly with IT systems – should therefore be the focus of development of new or revised occupations.

While many informants refer loosely to a range of new occupations which have emerged in the IT sector, in practice in several countries only a single 'new' occupation was mentioned – that of webmaster/webmistress. In most cases it seems that many of the new job titles can be relatively easily incorporated within the existing categories. The problem resides in the lack of disaggregation and specification of the existing categories, rather than the need to create new ones, at least at the four-digit level. In other cases informants said that while they could conceptually disaggregate the occupations in the sector more finely, in practice they did not receive sufficient information in applications to classify to the desired detail. With this second aspect, there could be a difference between census and survey applications, and employment services usages.

In some countries, the development of the categories to cover the IT sector has been more extensive than adding one or two occupations. In both US and Canada, for example, the developers drew on the work of associations or councils in the sector. In the US SOC, there are now 14 computer occupations at the most detailed level (1 in Management, 9 in Computer and mathematical, 1 in Architecture and engineering, 1 in Education, training and library, 1 in Office and administrative support, and 1 in Installation, maintenance and repair). In Canada, the classification aggregates the 24 divisions used by the Software Council into eight occupations, five in the professional field and three in technical areas. In both countries, it was too early to tell at the time of the interviews how well these classifications were working in the field.

In Australia, the employment services have come up with a total of 35 'occupations' in Computing and IT. The IT industry in the country is apparently keen to achieve standardisation. The ABS has undertaken to consider a special, early update of the classification to cover the sector if the industry can reach agreement. This had not yet occurred at the time of the interview.

Recommendation 15: *Information technology (IT) is an area that the ILO will need to follow up as it is clearly an area in which ISCO-88 will need to be updated. The ILO could help avoid unnecessary duplication of work by others if it draws on the work done in different countries to date and comes up with a suggested standard method of approaching IT occupations. On the education side, the ILO will need to provide clear documentation of the conceptual issues involved to guide national developers and users of ISCO-88.*

In several countries informants spoke about call centres where people are employed to field telephonic or electronic queries about a range of different services and products as a recent development which caused problems for classification. Call centre work has increased dramatically over recent years, whether as a result of IT development, outsourcing or other trends. However, call centre work cannot simply be classified as one or more new occupations. Informants pointed out that the type of work done was often industry-specific, and often required industry-specific training. Further, while some call centre work might involve relatively low skills, operators in services such as those providing health advice might be equivalent to the work of skilled nurses. However, from an implementation viewpoint, full information about the tasks and duties may not be provided, especially in a census. Part of the solution to the issue of call centre work might therefore be to provide for a relatively low-skilled call centre operator occupation. But a further important part is to develop rules about how to classify different types of call centre workers, and strategies to obtain the necessary information from respondents.

Recommendation 16: *The ILO should investigate how different countries are dealing with call centre work, and come up with best practice in the area.*

3.7.2 Managers and supervisors

Within ISCO-88, major group 1 – the category for legislators, senior officials and managers – is one of two (along with major group 0, which covers the military) which is defined without reference to skill level. Similar manager categories are found in several other classifications which are not based on ISCO-88. Informants said that this category had been added or retained in response to user demand, and because it reflected the reality of the labour market.

Although ISCO-88 does not assign major group 1 to a skill level, the sub-major and minor groups within this major group are designed so as to group occupations at similar skill levels. ISCO-88 did this by drawing on the ASCO approach and sub-dividing the manager category according to the size of the organisation. The approach is based on the recognition that the degree of managerial specialisation differs with size of the organisation. Thus jobs in larger organizations are likely to be more specialized in terms of their tasks, while those in small organisations will usually combine tasks from several jobs in a larger one. In other major groups, jobs are classified according to the most skilled tasks involved. In major group 1, the size differentiation is intended to provide more explicitly for the different degrees of specialisation.

In contrast, Canada's SOC is explicit about not assigning any skill level category at all to management. The documentation notes that managerial occupations 'span the entire classification structure and are found in all sectors or areas of the labour market. It states that, unlike for other occupations, factors other than education and training – such as 'previous experience, ownership of real property and capital, ownership of intellectual property, inherent decision-making skills and organizational capabilities ... are often more significant determinants for employment in management occupations.'

On the other hand, ASCO – despite its very similar conceptual background to ISCO-88 and the Canadian SOC – allocates managers to its highest skill level, above professionals. This is done on the basis that in the past a person generally required five or more years experience before becoming a manager except in areas such as accounts and finance. Today, with MBAs, some people move directly into management posts. However, the MBAs are usually at the postgraduate level. Further, many people only do MBAs after gaining some practical experience. Britain's SOC 2000, on the other hand, links major group 1 to skill levels 3 and 4. Overall, then, international practices do not give coherent guidance in respect of skill level for managers and there seems little reason to change ISCO-88's approach.

Beyond skill level, there are questions as to the scope of major group 1. Hoffmann (1999) notes that under ISCO-88, only those occupations which are primarily managerial should be classified in major group 1. Other occupations which involve some managerial tasks and some non-managerial should be classified according to the non-managerial tasks.

In interviews, many informants reported problems during implementation in relation to managers. These occurred both in countries using ISCO-based classifications, and in those with national classifications who wanted to develop crosswalks to ISCO-88.

One problem relates to differences in language and job naming practices across countries. In particular, English-speaking countries appear to understand the term 'manager' in a relatively loose way, while in countries such as France or Germany a person will only belong to the management cadre if they have been assessed by a board.

Thus a comparison across the core European countries on the basis of Eurostat statistics by Elias and Birch found that major group 1 accounted for 12% of the British workforce, compared to 6% in other countries. One reason for this seems to be that job titles in English-speaking countries often have 'glamorized' titles which include the word 'manager' when the work is not primarily managerial. One example of this phenomenon is the car guard who has the title 'parking director' proudly emblazoned on the back of her protective raincoat. These problems could potentially be solved by use of a 'tasks and duties' question and a good coding index. They nevertheless tend to cause confusion for users and implementers of the classification.

Informants also suggested that the United States, another English-speaking country, defined managers at a relatively low level. The US SOC attempts to circumvent this problem by specifying that a position is only to be considered managerial if there is another level of supervision between the manager and the worker. Other English-speaking countries adopt similar approaches. For example, ASCO assigns what it terms 'supervising managers', including shopkeepers, to associate professionals. Informants reported that users are generally happy with this placement, but complain that the title of the major group would not alert casual users to what it encompasses.

In South Africa, on the other hand, a significant proportion of people employed in the informal sector are classified as managers on the basis that they own and run their own businesses, however small. Many of these people have very low levels of formal education and skills. In some other countries, similar workers would probably be classified in an occupation which reflects the non-managerial work that they do in their businesses. Canada's SOC, for example, specifies a limited number of groups in which self-employed should be classified as a manager, namely proprietors in retail trade, food and accommodation services and residential home building.

The developers of ISCO-88(COM), the European Union variant of ISCO-88, introduced several amendments to deal with perceived operational weaknesses in major group 1 within ISCO-88. For example, the standard version of ISCO-88 distinguishes between corporate managers and general managers in terms of the total number of managers required to manage an enterprise, organisation or department, based on a reasoning linked to the possibility for specialisation between managers. Where the total number exceeds two, the managers are classified as a corporate manager.

The developers of ISCO-88(COM) acknowledged that ISCO-88's approach was conceptually sound, but found it proved unworkable in practice. To avoid operational problems by having to determine the number of managers, ISCO-88(COM) focuses instead on the total number of employees within the organisation. Managers in organisations with fewer than 10 employees are classified as the equivalent of general managers in ISCO-88, but with the name changed to 'managers of small enterprises'. ISCO-88(COM)'s solution appears to draw on the approach in the French PCS, but has a wider scope for what is considered management. In the PCS a manager is classified as 'chef d'entreprise' if there are more than ten employees. If there are fewer than ten employees, the 'manager' would be classified as an artisan or consultant.

Recommendation 17: *The ILO should survey the operational rules which different countries have developed to distinguish managers from other workers and amend the ISCO-88 rules, definitions and names of categories if there seem to be more workable solutions than the current one. The survey should include investigation as to how the rules are implemented in practice, for example through coding systems.*

ISCO-88 did away with the separate groups for supervisors which had been part of ISCO-68. The main reason for doing so was a perception that the necessary information to distinguish supervisors from others was often not available in applications. A further reason was that the distinction between supervisors and others is usually more about status in occupation than about occupation.

Hoffmann (1999) acknowledges that the treatment of supervisors is weak in ISCO-88 and that the chosen solution may have been too heavily influenced by the situation in countries where the role of supervisors is less clearly defined than elsewhere.

Some countries, while adopting ISCO-88 as the base for their national classifications, have been reluctant to adopt its recommendation to drop the separate classification of supervisors. Mauritius, for example, identifies supervisors in major groups 7, 8 and 9 with the codes xxx0. Britain has satisfied user demand to know about supervisors by adding an extra category to their classification of employment status.

Canada, with a classification which is not based on ISCO-88, provides for separate supervisor categories in clerical, sales and service, trades and transportation, and manufacturing at the major group level, and five further unit groups outside of the major groups. As in other countries, Canada generally has no separate classification for supervisors among professionals, with the exception of the unit group 'head nurses and supervisors'. ASCO similarly provides for supervisors in some areas, such as trades, but not in others. For the most part, the differentiation in ASCO occurs only at the six-digit level and is thus captured only in the five-yearly census and in any client-oriented use. Australia chose this approach as fieldwork confirmed that data were unreliable unless separate questions were asked about supervisory responsibilities.

Both those who differentiate supervisors and those who do not noted difficulties in implementation in that respondents will often not give the necessary information. One way of circumventing this problem is by including a separate question asking explicitly about supervision or authority, as is done in the Netherlands. In most countries it would be difficult to gain agreement for the necessary extra question in a census, although it might be possible for household surveys.

***Recommendation 18:** The ILO should consider whether some supervisory categories need to be reintroduced. It could be that the perceived developments in the labour market on which these categories were abandoned are not as widespread as previously thought. Further, as one informant pointed out, without separate categories for supervisors, it is impossible to measure the extent of such changes.*

3.7.3 Trainees and apprentices

ISCO-88 requires that trainees and apprentices be classified according to their tasks and duties. This is different from ISCO-68, where apprentices were to be coded according to the occupation for which they were being trained, while trainees were classified according to actual tasks and duties performed.

Informants were less concerned about these categories than about others such as managers and supervisors. Most agreed that these were status differences rather than occupation categories. Informants also noted that the necessary information to distinguish trainees and apprentices was usually not available without an extra question focused on this aspect.

Mauritius has, however, retained this element of ISCO-68, by adding .85 as additional digits to indicate apprentices and trainees. Tanzania, which also has a national classification based on ISCO-88, does not identify trainees and apprentice in the main classification. However, it allows for the addition of a prefix A to the usual six-digit occupational code where this is considered necessary for human resource development planning. Cyprus initially retained separate codes for trainees and apprentices when it first aligned its classification to ISCO-88. However, in a later revision the separate codes were dropped.

Recommendation 19: *Given the relative silence on the topic of trainees and apprentices, there does not appear to be any need for changing ISCO-88's approach. The issue also concerns status in employment rather than occupation.*

3.7.4 Agriculture

Non-ISCO-based classifications such as the German KdB and Swiss national classification have a separate category for all jobs that are mainly found in the agricultural sector. This is not surprising as these classifications are, as a whole, more sector-oriented than ISCO. (See case studies.)

The developers of ISCO-88 exerted significant effort in trying to devise an appropriate way to deal with agricultural occupations. The effort involved, among others, consultations with the United Nations Food and Agriculture Organisation (FAO). The developers' solution was to dedicate major group 6 of the classification to skilled agricultural occupations. At first glance, this appears to be a hangover from the more sector-based orientation of ISCO-68. However, this major group is not intended to cover all workers in agriculture. In particular, agricultural machine operators should be classified to major group 8, less skilled workers should be classified in major group 9, and managers should be classified in major group 1. Major group 6 caters for occupations which are specific to agriculture. The occupations concerned are assumed to be at the second skill level, but differ from those in major groups 7 and 8 in terms of the nature of the work, products produced and tools used.

Although many national classifications have a separate cluster for agriculture, there are differences in how these are conceived and which groups of agricultural occupations are placed in this cluster. In particular, there are differences in how farmers are categorized.

In the national classifications used in France and the Netherlands, it seems that farmers tend to be classified as managers, whereas in Sweden, where the classification is based on ISCO-88, they are classified in major group 6. The French PCS provides for three groups of agricultural managers according to the size of the farm. Those responsible for the recent revision of the PCS were aware that the classification is over-detailed for what is now a small category. However, because they were updating rather than revising, they decided not to change this aspect.

The different practices of different countries may reflect differences in the objective situation in the countries, for example in the size of average farms. But it also reflects perceptions of the social status of farmers and agriculture more generally.

Sometimes there are also practical reasons for the way in which agricultural occupations are classified. In the United Kingdom, SOC 90 classified farm workers in major group 9 and farm owners in major group 1. The National Union of Farmers was reportedly upset about the classification of farm workers in major group 9, but the Office of National Statistics (ONS) felt that it could not accurately identify from job titles which workers had the necessary qualifications or competencies to be classified as skilled. With SOC 2000, Britain has abandoned a separate major group for skilled agricultural workers.

Colombia adopted a different approach to the UK after experiencing difficulties in deciding whether agricultural workers should be placed in groups 6 and 9 on the basis of occupational titles. As a result of the difficulties, Colombia decided that no agricultural workers should be classified in group 9.

The United Kingdom approach of abandoning a specific agricultural grouping might increasingly be adopted in developed countries as the share of agriculture in the economy decreases. Eurostat data reveal that agriculture accounts for around 4% of employment, on average, in western European countries. In the United Kingdom, Belgium and Luxembourg it accounts for less than 1% of employment. These figures reflect sectors rather than occupations. The number of workers who should be classified as having occupations in major group 6 of ISCO-88 would be even fewer.

Agriculture could therefore be considered an unimportant issue if we looked only at the developed countries even if many informants appear to be uncomfortable with how they are currently dealing with agricultural occupations. ISCO-88 is, however, intended to be a basis for classifications beyond the developed countries. And agriculture accounts for the majority of employed people in many parts of the developing world. It is thus important that ISCO ‘gets it right’.

Unfortunately, we have little evidence on how agricultural occupations are dealt with in the classifications of developing countries. South Africa is the only developing country for which in-depth information could be obtained in this study, but it is atypical as it is a middle-income country, where agriculture accounts for only around 10% of total employment. Further, the subsistence sector in South Africa is unusual in that because of the apartheid past, most of the subsistence holdings are far too small and infertile to provide very much. In the past, this group of workers did not pose too much of a problem in that coverage of surveys and the way questions were phrased meant that very few subsistence workers were captured. Over recent years the capture of this group has improved, and the question has therefore arisen as to how they should be classified. Statistics South Africa’s solution has been to classify all subsistence farmers in major group 6. This is in conflict with social perceptions of the social and economic status of this group, which generally has very limited formal education, as well as with their potential mobility within the broader world of work.

The South African situation is not typical. However, it does illustrate a key difficulty which is probably found in other countries as well, namely that the major group as currently envisaged is not heterogeneous with regard to skill level, and does not necessarily sit comfortably within ISCO’s conceptual framework.

Recommendation 20: *The wide variation in how agricultural occupations are dealt with in developed countries, the economic importance of the agricultural sector in the developing countries which are most likely to rely on international standards, and the current misfit in terms of ISCO’s conceptual framework suggest that the issue should be re-investigated. In particular, it will be important to obtain information from a range of middle-income and low-income countries as to how they are dealing with occupations in both commercial and non-commercial agriculture. A change in ISCO’s structure might then be considered necessary.*

3.7.5 Civil service

ISCO-88 does not provide a separate major group or subordinate categories for civil servants. In general, civil servants are classified together with those in the private sector who perform similar tasks and duties. The only difference arises in respect of the relatively few civil service occupations (minor groups 344 and 345) which are considered to have no equivalent in the private sector.

Other non-ISCO-based classifications generally appear to adopt a similar approach. In the French PCS, whether an occupation is inside or outside the civil service has more weight than in other classifications in that this is one of several variables which are considered to determine socio-professional status. (See case study on France.) Several of the categories of the classification thus provide for a distinction between civil service and other incumbents by allocating different codes. An informant explained the fact that the grading system takes precedence over function for civil servants by the greater employment security, higher qualifications and generally different 'behaviour patterns' of civil servants when compared to private sector employees. The clearer differentiation of civil servants in the PCS thus reflects its concern with social status rather than the more common conception of occupation.

Canada has a different approach to civil service work. As with ISCO-88, occupations within the civil service which have equivalents elsewhere are classified together with those equivalents. However, the fourth skill 'type' in the Canadian matrix provides, among others, for occupations specific to public administration. The variation from other classifications relates to the fact that it is not only civil servants who are classified in the public administration 'column' of the matrix. Private sector and other non-governmental occupations in the field of social policy and related areas would also fall in this category.

While the approach to civil service occupations in ISCO-88 is conceptually clear, implementation is difficult. In particular, informants in several countries observed that civil servants often report their occupation in terms of bureaucratic titles or grading systems which reflect rank, pay and seniority rather than in terms of titles which reflect tasks and duties. The problem is particularly severe in countries with long-established bureaucracies. To complicate the problem, the ranking and titling systems differ between countries, and even between different parts of the civil service in a single country. Further, in countries such as the United Kingdom, the differences are increasing as parts of the public service gain relative autonomy in developing their own grading systems. Australia's solution to this problem is to specify in the question on occupational title that civil servants should report both their designation and a title.

Several informants also complained that ISCO-88's treatment of major group 1 is more appropriate for the private sector than for government employment. Part of the problem lies in defining the 'enterprise, organisation or department' under ISCO-88 or the 'administrative unit' under ISCO-88(COM). Because of the problems in implementation, many statistical agencies would prefer to have separate sub-categories for civil service occupations, both in this major group and among professionals. ISCO-88(COM) deals with this demand by creating a public service administrative category within major group 2. It does not, however, provide for a separate category for civil service managers. The developers of the Swedish SSYK saw this as a particular area of weakness of both standard classifications.

The Pakistan national classification, which is also based on ISCO-88, meets the demand for greater detail on high level civil service occupations by dividing the unit group 'senior government officials' into divisions such as audit & accounts, banking, insurance and financial; police services; secretariat and managing services; educational services; foreign services; judiciary and district administration; medical; research, monitoring & evaluation; engineering and other.

The limited range of countries visited makes it difficult to judge the extent to which the reported problems with civil service occupations would be found in other countries. It could be that the problems are more acute in countries with long-established and hierarchical bureaucracies. Some support for this contention is found in the fact that informants from both Canada and South Africa said that they did not encounter the problem to any significant extent. On the other hand, the legacy of colonialism could mean that many developing countries have civil services which inherited these characteristics of the developed countries.

Recent decades have seen major shifts in the size, structure and functions of governments, whether through decentralisation, downsizing or other reforms. These initiatives could not but have affected the number and range of occupations within the civil service. Further, the contracting trends and public-private partnerships which are increasingly common in many countries could mean that increasing numbers of people in the private sector are performing tasks and duties similar to those performed in the past by civil servants. If this is true, the Canadian approach could be the way to go. Some might argue that this approach removes the possibility of monitoring the trend towards privatisation. However, monitoring can best be achieved by including a separate question as to the nature – government, private, parastatal, non-governmental – of the employer rather than trying to include it in the occupational classification.

Recommendation 21: *The ILO should spend some time investigating how it should and could cover occupations associated with public administration.*

3.7.6 Military

ISCO-88 provides a separate major group (0) for those employed in the armed forces. This major group and major group 1 are the only ones which are not defined in terms of skill level.

When ISCO-88 was being developed, the ILO secretariat suggested that people employed in the military should only be classified in major group 0 if there was not an equivalent occupation outside the armed forces. This suggestion was not accepted by the ICLS. Instead, the Conference decided to retain the ISCO-68 solution that all occupations within the armed forces except those involving civilian employment should fall in major group 0.

The motivation for the Conference's approach is unclear. There are suggestions that it arose from a concern around secrecy in relation to state security. However, providing a separate category in effect reveals more than the secretariat's suggested approach unless the category is not disaggregated. Another possible reason is that many surveys exclude army barracks and would thus not provide adequate coverage of the military. Again, this does not seem to be a good reason. Incomplete coverage and its implications can be explained in reports and technical notes. Further, classifications should provide for all possible types of surveys and censuses, and therefore allow for cases where workers in the armed forces will be covered.

While many countries may have adopted the Conference's approach, others have not. Canada has a dual approach in that the military is separate in the version of the NOC used by Statistics Canada, but incorporated in other groups in the version used by the employment services. Britain's SOC 2000 is close to ISCO-88 in many respects, but treats the armed forces along the lines originally suggested by the secretariat. Germany's KdB also provides for special military codes only for those workers who do not have counterparts in the private sector. In the United States, the general occupational titles and definitions were modified during the development of the SOC to allow coverage of the military.

Recommendation 22: *The ILO should again suggest to the ICLS that the military not be treated separately, and should develop the arguments as to why this approach is preferable. In addition to pointing out that integration is common in other countries, the ILO could point out that integration will facilitate placement of those who are demobilized, as well as recruitment by the military of those employed outside the military. It will thus facilitate better use of the available human resources of a country.*

3.7.7. Informal sector and informal economy¹

Unlike the sectors and categories discussed above, the informal sector does not appear explicitly within the ISCO-88 structure. However, one of the aims in the development of ISCO-88 was to 'reflect labour markets of developing as well as industrialized countries, informal as well as formal' (International Labour Office, 1987, and Hoffmann, 1999).

The concept of the informal sector emerged in the 1970s, in Kenya. In subsequent years the concept has been used widely, particularly in the developing world. There is, however, wide variation in how the term is understood. For statistical purposes, a definition has been developed which focuses on the nature of the establishment in which the individual works rather than on the characteristics of the worker concerned. Most commonly, this is operationalized by regarding work as informal if the establishment is not registered, or if it employs less than a stipulated number of workers.

In recent years a further concept – the informal economy – has been developed which focuses on the individual rather than the establishment. For example, a worker employed on a casual basis in a registered establishment without a secure contract, worker benefits, or social protection, would be part of the informal economy but not part of the informal sector. At this point there are few, if any, statistical agencies that produce measures of the informal economy, or even the informal sector, on a regular basis. It is, however, generally accepted that the number of workers who would fall in these categories is increasing in many parts of the world.

This sub-section of the paper therefore discusses the informal sector, which is measured by some statistical agencies, although there is no single, standard approach. The sub-section which follows discusses 'atypical work', which covers something analogous to that part of the informal economy which is within the formal sector.

¹ For an overview of the debate on this question within the ILO, see ILO: Decent work and the informal economy (International Labour Conference, 2002) and International Labour Conference, 2002, Provisional Record No. 25.

Informants were asked whether occupations in the informal sector posed any particular problems. Within Europe, many informants seemed puzzled by the question. Part of the puzzlement could be differing understandings of what constitutes the informal sector. Some informants equated the informal sector with the illegal or black market, and said that it would rarely be captured in the first place and was thus of little concern. Where it is captured, informants noted that legal status was irrelevant, as occupation focuses on the type of work done. Other informants understood the informal sector as referring to non-market work. Most said this phenomenon was insignificant in their countries.

Another part of the puzzlement would be the relative smallness of the informal sector within the developed countries, even when defined according to the standard statistical definition. However, size alone will not ensure that attention is paid to the sector. South Africa's informal sector has grown significantly over the last few years, although it still makes up a much smaller proportion of the total economy than in most other African countries. Statistics South Africa's attention to the sector and ability to capture it has also grown in recent years. However, Statistics South Africa informants reported that the sector has not posed particular problems in respect of coding occupations. Further, none of the new occupations added to ISCO-88 in developing SASCO are ones that are common in the informal sector.

In contrast, South Africa's neighbour, Namibia, felt that the existence of the informal sector should be reflected in the classification. The introduction to their documentation acknowledges that NASCO-96 'is mainly a classification of the formal sector even if the need to identify occupations in the informal sector was taken into consideration'. It explains this failure by the limited information available on informal sector classifications. Nevertheless, the developers were able to include at least ten unit groups which were considered more or less specific to the informal sector, namely traditional leader, traditional healer, builder with traditional materials, brickmaker, handicraft worker in wood and related, handicraft worker in textile, leather and related, local beer brewer, street food vendor, non-food street vendor, and street services elementary occupation. Some, but not all, of these are included in ISCO-88. NASCO-96 also provided for different types of agriculture by dividing sub-major group 62 into communal farmers not specified, subsistence animal producers, subsistence crop and animal producers, and subsistence fishery, hunting, trapping and related. Subsistence work is not part of the informal sector, but is part of the informal economy.

When asked about the informal sector, informants in Australia and Canada reported that there would be subsistence farming and different forms of informal sector work among their aboriginal populations. These have not, however, been of major concern. Firstly, in both countries the aboriginal territories are not included in the scope of the labour force survey (LFS). Secondly, the sector is not regarded as important economically. Canada's classification does provide for a hunter and trapper, which represent the main economic activities in the aboriginal territories. However, Canada has decided that subsistence work will not be included in the production boundary when drawing up the national accounts. In Australia – and perhaps other countries – the formulation of the question which determines whether a person is employed in terms of work 'for pay or profit' would automatically exclude most subsistence producers.

Australia's neighbour, New Zealand, provides for several occupations which reflect Maori forms of work, such as 'Köhanga Reo Teacher' and 'muttonbirder' (not captured in the census, as harvesting of these birds is illegal at census time) as well as 'Karitane nurse' which is particular to New Zealand. These occupations are not necessarily part of the informal sector, but they do reflect an awareness of alternative types of work.

Some countries in Latin America have adapted their classification to reflect the informal sector by 'promoting' large categories at the three- or four-digit level to higher-level groups. One example is that of domestic workers, who constitute one third of female employment in many of these countries but appear at the four-digit level in ISCO-88. Latin American countries often do not code to the four-digit level, with the result that this important group would have been masked by other occupations were it not for the 'promotion' to a higher level.

In several of the developed countries, informants spoke about voluntary work when asked about the informal sector. While informal sector work might sometimes not be paid for with money, it is different in economic terms from voluntary work. Informal and subsistence work should, according to the System of National Accounts, fall within the production boundary of national accounts, while voluntary work falls outside the boundary. ISCO-88 and other occupational classifications are usually designed to cover activities that are defined as falling within the production boundary of the national accounts. Voluntary work should, therefore, be excluded but informal and subsistence work should be catered for. In practice, it seems, developed countries might be excluding informal sector and subsistence work.

The Delhi Group is a specially constituted group of practitioners from statistical agencies with a particular interest in the informal sector that is reporting to the UN Statistical Commission. In recent years, the Delhi Group has made representations for changes to the International Standard Industrial Classification of All Economic Activities (ISIC) so as to better reflect the situation in the informal sector. The Group has not to date focused on ISCO and its possible shortcomings. As part of this consultancy, the ILO disseminated a letter to all who had participated in Delhi Group meetings asking if they had any observations or suggestions to make in respect of ISCO-88. There were no responses to the letter.

Recommendation 23: *The ILO should investigate the extent to which jobs that are predominantly found in informal sector activities are being covered in statistical collections and, where they are covered, investigate whether classifications have been adapted to adequately reflect such jobs and/or whether they (including ISCO-88) need to be adapted. This work should be given priority as the informal sector is an important component of the economy of many countries, and particularly countries which are unlikely to have the resources to do much work themselves on occupational classifications. As part of its educational activities, the ILO should attempt to stimulate interest in, and understanding of, the informal sector beyond the few countries which currently participate in the Delhi Group.*

3.7.8. Atypical work²

One concern in developing ISCO-88 was catering for less industrialized countries, where 9-5 formal employment as an employee was not the norm even outside the rural, subsistence economies. Writing a few years ago, Hoffmann (1999) notes that 'anecdotal information suggests that new contractual forms and borderline situations are becoming more common also in [the traditional market-oriented industrialized economies]', with the proliferation of individuals who work as owner-managers, taxi-drivers who lease their taxis, day labourers, franchisees, and dependent contractors. However, Hoffmann notes that a 1998 survey of practices of national statistical offices (see Elias, 2000) found them seemingly unconcerned with these situations.

² This topic has been addressed by the ILO in connection with the employment relationship. See for example, International Labour Conference, 2003, Provisional Record No. 21.

In each country visited, it was asked whether the growth of atypical work had caused problems in classifying occupations. In line with the findings of the 1998 survey, for the most part atypical work was reported not to be an issue. Informants noted that the growth of atypical work involved a change in status rather than a change in tasks and duties. The only problem which emerged repeatedly was that respondents often gave their job title simply as 'consultant' or 'expert' or 'adviser'. This title clearly provides insufficient information for coding purposes.

It is difficult to believe that this issue is as unimportant as suggested. In all countries visited in this study, informants spoke of the need to revise and update their classifications given the fast-moving changes in the world of work over recent times. When prompted as to the nature of these changes, however, most focused on the growth of the IT sector, growth of services, and decline in manufacturing. Some also referred more generally to globalisation. None spoke about the growth of atypical work, despite the fact that this is well-documented in sociological and economic literature.

One explanation for the lack of awareness and interest in atypical work could be that statistical investigations are simply not picking up this type of work. Indeed, several countries have found that standard ways of asking about work performed in the reference period do not evoke the appropriate responses from people doing casual work or some other forms of atypical work. Further, employment services users could be unaware of the importance of this form of work because the employers and job seekers whom they serve are mainly concerned with 'typical' work situations.

If a classification of occupations is to provide comprehensive cover of the world of work, we need to be sure that it covers all forms of work activity, regardless of the status in employment of the individuals concerned. Current evidence does not provide conclusive proof that most classifications do this well.

Recommendation 24: *The ILO should promote awareness of the problem of atypical work and advise countries how they can better capture information on atypical work situations. Once this has been achieved, monitoring of the results should reveal whether any changes in the occupational classification are necessary.*

3.7.9. Commercial sex workers³

One group of workers which received considerable attention in the discussions around ISCO-88 is commercial sex workers. The developers of ISCO-88 suggested that a separate minor and unit group be created for 'prostitutes'. After heated discussion at the 14th ICLS, this proposal was not accepted. Instead, commercial sex workers were to be classified in the unit group of 'other personal service workers'.

In many enquiries commercial sex work will be under-reported, whether because it is illegal, decriminalized but frowned upon, or simply because of public attitudes to the occupation. Some countries might nevertheless want to include a specific category for this occupation in their national classifications. ISCO-88 provides the opportunity for them to do so, just as there is the opportunity to disaggregate any other existing unit group.

Recommendation 25: *Given the wide range of attitudes to the recognition of commercial sex work, it does not seem likely that consensus will be reached on this issue. The ILO should thus not attempt to introduce a separate unit group for these workers in ISCO.*

³ See L. Lim, *The Sex Sector* (Geneva: ILO, 1998).

4. Methodology for development, maintenance and updating

4.1 ILO work in developing, maintaining and updating ISCO-88

In advising countries, the ILO always emphasizes the need for an ongoing programme to update the classification. However, Hoffmann (2001: 1) acknowledges that the ILO itself has done very little in this respect on ISCO-88. For example, the organisation has several times postponed the establishment of an ISCO-dedicated website. It has not succeeded in publishing a manual on developing a national occupational classification system despite the fact that this was planned as far back as 1986, and many of the elements have already been prepared. (See Embury et al, 1997; Gilbert, 2000; Hoffmann, 1994; Hoffmann, 1999; Hoffmann, 2001; Hoffmann et al, 1995; Hoffmann & Chamie, 1999; UNSD & ILO, 2002.)

Several informants suggested that the definitional material for the unit groups in ISCO-88 is one of its weaker points. The introduction to the ISCO-88 publication states that the ILO planned to select among the 1,506 detailed occupational descriptions included in ISCO-68 and publish those which were still relevant in a companion volume. ILO did not achieve all that was planned. However, the secretariat was able to prepare diskettes in English, French and Spanish with detailed ISCO-68 descriptions still considered relevant given the structural differences between the two classifications. Discarded occupations were primarily those relating to supervisory groups and those for public sector officials, which did not have useful definitions. About 150 definitions were modified to correspond to the more up-dated definitional descriptions used to request statistics on wages and hours of work for the ILO October Inquiry.

One informant suggested that the lack of detailed descriptions in ISCO-88 could be the reason that some countries have not converted from ISCO-68 based classifications. She suggested that this be especially the case in countries that previously translated ISCO-68 into a language other than English, French or Spanish. However, most of the countries which are still using ISCO-68 are either Spanish-using or English-using.

Another informant pointed to weaknesses in the ISCO-88 index. He observed that having a good index was the sine qua non for effective coding, and that ISCO-88's weakness in this respect would therefore have serious consequences in terms of data quality. The ILO's response to this criticism is that differences in occupational titles between countries preclude the construction of a solid international coding index.

None of the observations above imply slackness on the part of the ILO. In the face of limited resources, Bureau of Statistics staff have spent much of their time providing guidance to individual countries in understanding ISCO-88. However, while this work has been appreciated, the development of a manual, website, and other general material has the potential to reach a greater number of people than the one-on-one contact. Secondly, as noted above, the ILO faces even bigger challenges than national custodians in updating and maintenance in that it does not have direct contact with the world of work. Thirdly, in terms of the index, there are limits to what can be achieved in an international classification given the variation in the ways occupations are named in different countries.

Recommendation 26: Work on the manual, website and definitions should be allocated the necessary resources and completed as soon as possible. In the case of the manual, chapters could be published as separate booklets. This would allow for earlier publication of those that are near finalisation, and make the product less intimidating for the user. The ILO should also consider the development of a range of further model tools which could assist users of the classification who have limited resources to develop these from scratch for themselves.

4.2 Development, maintenance and updating of national classifications

Hoffmann (1998: 225-6) notes that 'one can easily get the impression that most of the organizations which have been able to develop a reasonably finished [national occupational classification] tend to collapse from the effort after crossing the finishing line'. The country case studies provide some support for this observation. Even in these developed countries, it seems that extensive effort and resources can be expended during a development phase, but far less is done between revisions in terms of updating or maintenance. This weakness affects the revisions, as the classifications become out-of-date sooner than necessary, and generate more complaints than they would otherwise. Further, where countries do not have established systems for updating and maintenance, they are less likely to have systems whereby they regularly collect information which could inform subsequent revisions. They are also less likely to document the updates and maintenance. These weaknesses mean that those who work on or use the classification at a later date may not understand why certain changes were made, and what this implies for further development. The weaknesses also mean that there is less for the ILO to draw on in revising ISCO.

The situation in most developing countries is almost certainly worse. In many of these countries the development of a classification will be supported by external agencies, whether through technical or financial support or both. This support is unlikely to extend beyond the development phase. In some cases it seems that the development stage itself is not completed in that the structure is in place, but not the definitions, coding index, coding tools, and other elements that are necessary for efficient use of the classification.

The lack of follow-through is cause for concern because the classification in the form of a structure is only a small part of the total classification project. Embury (1991) suggests, from the statistics agency side, that implementation of a classification requires the development of an appropriate collection methodology, coding or derivation procedures, editing specifications, storage and output conventions. The implementation tasks assume that the structure, including full definitions and descriptions, is already in place. At the other end of the production line, the list of tasks could be further expanded if the full range of usages of the classification is considered.

Documentation from several countries acknowledges in the introduction that in publishing the classification they have only taken a first step. Many classifications never progress beyond short definitions of each occupation, if they get that far. The experience of Australia is instructive here in that the country has spent very significant resources over the years on many aspects of its classification. The development of the ASCO working draft, for example, used 40 work-years of staff resources over a three-year period, and the country has continued to devote resources to this area. Nevertheless, Australia has not to date been able to publish a full set of descriptions which suits all users. For the current revision, the ABS is planning to produce even shorter definitions of occupational categories than before. Development of comprehensive descriptions of occupations is seen as the mandate of employment services, but they have, in the past, not had the resources to carry it through a full validation process.

Australia has, however, performed well in developing coding tools. In particular, the ASCO Coder is a fast, efficient and accurate coding instrument which is distributed free to all users of ASCO. In the mid-1990s there were discussions about the possibility of developing an early version of the ASCO Coder into a tool that could be adapted to different languages and used on stand-alone, small-capacity personal computers for coding of occupation and industry in the 2000 round of population censuses in developing countries. Unfortunately, this project did not materialize.

One of the particularly impressive aspects of the Coder is the way it deals with different types of information. Many countries have taken up the ILO suggestion that instruments include two questions – one on occupational title and one on main tasks and duties. Not all countries necessarily use this information as effectively as they could. The Coder does so by incorporating a complicated set of priority rules that ensures that coding uses all the information when, and only when, it is appropriate.

The paragraphs above might suggest that there is no work being done on maintenance and updating outside of revisions. This is not true. Some informants described parts of their operation which would be worth sharing with other countries. Because of the relevant isolation of the classification experts in most countries, they often had a very limited idea of what was being done elsewhere, and were therefore not aware of where their experience was unusual

Some of the things that stand out as worthy of further investigation are the way in which the UK and Canada examine ‘transactions’ in their job matching systems, the in-depth research which has been conducted among users in the UK and Australia, the extensive analysis which Australia has conducted over the years into all aspects of coding, and the different ways in which countries analyse the data they obtain from surveys and censi. In terms of coding indices, it would also be useful to look at work in countries dealing with multiple languages (Switzerland), as well as how Switzerland and Netherlands are working with running numbers. New Zealand uses line codes in its coding index to obtain accurate counts of how many times a coding index response is used, giving them, in effect, a sixth level to the classification. These aspects do not all relate directly to maintenance and updating. However, where countries have thought carefully about a particular tool, they have usually also devoted some thought as to how to keep it up and running in good order.

It is unlikely that any one country will emerge as having solved all the problems. What would be useful for both the ILO and the countries concerned is to identify countries which have something approaching best practice in a range of different areas, and to bring them together to share experiences. The ILO would gain by learning about best practice and being able to pass on the knowledge and contacts to countries which are less well-resourced to do the work on their own. The country experts would gain from the interaction and be able to improve their own systems based on what they have learnt.

Recommendation 27: *The ILO should convene a regular forum of occupation classification experts which would focus on different aspects of development, maintenance and implementation. The forum meetings should take the form of working sessions rather than simply consisting of presentation of conference papers. The meetings should include demonstrations of different solutions. The ILO should document the forums and make the reports available to people working on classifications in other countries.*

5. Conclusions

5.1 Which is the best model?

Hoffmann and Chamie (1999) suggest that the standard international classifications 'should, as far as possible, reflect what is currently considered to be "best practice" in the substantive areas they cover.' The country visits undertaken for this study suggest that there is no single best practice that stands out as being the solution for the diverse range of countries which make up the world. Individual countries have developed solutions for their own situations, with particular strengths in different aspects. However, none stands out clearly as a superior alternative to ISCO-88 when one considers a range of countries rather than an individual one.

The evidence collected suggests that a comprehensive revision of ISCO-88 is neither necessary nor desirable at this stage. All informants had some complaints about ISCO-88, but none seemed serious enough to warrant full revision. In particular, there were no serious complaints about the conceptual basis. Where people have modified ISCO-88, for example in the development of ISCO-88(COM), the modifications do not necessarily imply that ISCO-88 is 'wrong' or deficient in some way. Indeed, the possibility of such modifications was envisaged, and intended, by the developers. Where countries have classifications significantly different from ISCO, they generally acknowledge that their model would not be appropriate as an international classification.

In the case of the French PCS, for example, the classification is a socio-professional classification rather than a simple occupational one. (See case study on France.) Further, one of the main objectives in developing the PCS was to reflect the specific social construction of French society. In the case of Netherlands, informants stated that one of the main weaknesses of the national classification was that it was specific to the country in having very strong links between their educational system and occupations. In countries such as Germany and Switzerland, informants pointed to the strong links between their national occupational classifications and the systems of training, qualifications, bargaining and wage setting. All of these are peculiar to the countries concerned and thus not a good basis for an international classification.

A further reason to avoid radical change is that over the last 15 years a significant number of countries have aligned their national classifications with ISCO-88 in some way, many of them only recently. A further significant number had not yet had the resources or interest to do so. Thus the 2002 edition of the ILO's Yearbook of Labour Statistics reveals 62 countries where the latest available statistics on employment by occupation (table 3E) were presented according to ISCO-88 major groups (45 in the 2000 edition), while the presentation was according to the major groups of ISCO-68 for 20 countries (27 in 2000). The corresponding numbers for ISIC, rev. 3 and rev. 2 were 65 and 30 respectively (53 and 33 in 2000).

The interviews in this study made it clear that true revisions of national classifications entail significant amounts of work for those responsible and consume considerable resources. In most cases the process spans several years. In countries which take the work seriously, revisions require in-depth research. Because of the resource intensity of the work, in many cases the process is not followed through. In particular, countries often do not develop all the necessary supporting documentation in respect of revisions. As noted above, the ILO itself has not had the resources to develop all the supporting material it planned to develop in respect of ISCO-88.

Beyond the developers, revisions generate major disruptions for users at all levels in learning and understanding the new system and setting up the systems to use them. Several of the case studies attest to the slowness with which revisions are implemented by users, even within government. Major revisions obviously also cause problems with production of time series.

Several informants referred to the chaos induced by major revisions, and resistance encountered when they proposed changes. Resistance to change is particularly strong among those dealing with the more 'statistical' uses of a classification. Users concerned with vocational guidance and employment services would often be less opposed. One reason for lesser opposition is that ISCO-88 has, to date, been used less for employment services than for the more statistical and reporting and research purposes. In developing countries, in particular, the formal job market is not developed enough and government resources not sufficient to allow for well-developed job matching systems. There would thus be little to disrupt. However, where countries are using the classifications for employment services, a revision could entail significant work, especially where a computer-based system has been developed on the basis of a classification.

If revision is judged undesirable, the choice lies between improvement and updating. The detailed discussion above suggests that ISCO-88 needs both. There are some areas where there needs to be some shifting around of occupations and sub-categories within the structure. Most of these will aim at better meeting the original intention and conception of ISCO-88 on the basis of the experience and experiments of different countries. Others will be pragmatic changes which take account of the practical difficulties realized in the implementation of the 'pure' concept underlying ISCO-88.

There is also a need for updating of occupations and the accompanying definitions to accommodate the significant changes that have occurred in the world of work over the last 25 years. In this respect, there is also a need to establish a system for ongoing – or more frequent – updating so that the international classification does not again become so seriously out-of-date.

As noted above, the ILO is not well placed for updating because of its relative isolation from the world of work. With the current ubiquity of email and internet, however, if countries were willing to cooperate, it should be possible for the ILO to become a repository for information on new, emerging and changing occupations in different countries. This repository could be used both for updating of ISCO, and for assisting other countries experiencing similar trends. It should also be possible to develop a system for conducting 'conversations' between the custodians of national classifications and the ILO. Ideally, such conversations would be in multiple directions. An alternative, or additional, possibility would be for ILO to establish a 'helpdesk' which acts as an intermediary between countries with problems and those with possible solutions.

Recommendation 28: *The ICLS should request the ILO to improve and update ISCO-88, and not embark on a major revision of the classification.*

Recommendation 29: *The ILO should plan for future improvements and updating to occur on a more regular basis than has been the case in the past.*

Recommendation 30: *The ILO should explore the possibilities of electronic networks which would provide it with up-to-date information about changes in the world of work detected by national agencies.*

Beyond improvement and updating, the ICLS needs to consider what other steps it can take to ensure that ISCO-88 contributes to the production and use of more reliable and comparable occupational information around the world. In thinking about this, it is useful to reflect on what is understood as the role of an international standard classification.

5.2 The role of an international standard classification

190. ISCO-88 was developed primarily as a model which would form the basis for national classifications. It was aimed, in particular, at countries which – unlike most of those profiled in this report – do not have the resources to undertake the development of a complete country-specific classification. One of those involved described it as a ‘colour-in book’ approach, where ISCO-88 makes available a basic structure to which countries are then expected to add the ‘colour’ and detail of their particular world of work. This approach is reflected, among others, in the restriction to four levels, with the expectation that many countries would go further to split up the fourth-level unit groups into more detailed occupations.

In practice, many countries do not have the resources even to adapt ISCO-88 to national circumstance to the extent envisaged. Instead, many have adopted ISCO-88 “as is”. Hoffmann (1998) notes that widespread use of ISCO has not always been based on careful evaluation. Nevertheless, adoption of ISCO could be a cost-effective decision given limited resources in a particular country. This reality has implications for how the ILO moves forward with the classification.

A danger of simple adoption is that users and producers do not engage sufficiently with its underlying concepts, and therefore use it incorrectly. Misunderstandings also occur where countries adapt ISCO. In both cases, it seems that what ILO is currently offering is not sufficient to avoid misuse, or sub-optimal use.

Informants from the developed countries were generally supportive of the idea that the ILO should pay more attention to the needs of less well-resourced countries than to their own needs. As one put it, the ILO should see its mandate as providing the ready-made solution for those who could not afford tailor made. Those who could afford tailor made would prefer to develop their own classifications, as they would then have more control over the nature and timing of changes.

The same informant pointed out that the more developed countries were also likely to use the classification for a wider range of uses. This would increase the desire for a tailor-made solution. On the other hand, as a country developed more uses, it could be expected to have more interest in having a tailor-made solution, and might start allocating the necessary resources.

Recommendation 31: *The ILO should accept that many countries will choose to adopt ISCO rather than adapt it. It should devise its support and development strategies accordingly. It should not encourage adaptation or development of a national classification where there are inadequate resources as this is likely to result in a sub-optimal and unfinished product. It should rather concentrate on finding ways of helping those who choose to adopt or adapt ISCO to use it optimally.*

5.3. One classification fits all?

The discussion above has at several points referred to the difference in needs and experience of the more statistical producers and users of occupational information, and those providing services based on the information. It might, however, have suggested implicitly that a single classification is used by all users in any one country.

In many countries, a single classification is indeed being used for both employment services and the more statistical uses. In France, on the other hand, there are completely separate classifications for the two purposes. However, even here, the felt need for a single classification which could match statistics from the two sources led to the development of a third classification which linked the two.

In France, the decision to have separate classifications was a deliberate choice. In many other countries there are also separate classifications, but often it seems that this diversification was a result of lack of communication, or lack of awareness of the benefits of a single classification. In the US, use of different classifications reflects a high level of decentralisation within government.

The idea of a single classification to cater for all uses is appealing. Informants in Canada and Australia were particularly convincing on what had been gained by having a single classification. They pointed, for example, to the need for those working in employment services to have the necessary statistics to inform their practice so they could deliver appropriate advice to government and services to users. The wide range of ways in which the classifications are being used in both countries suggests that having a single classification increases awareness of the possibilities and provides new opportunities to use available information.

The consultancy which preceded the development of ISCO-88 suggested that the decisions of the ICLS should be informed primarily by concerns around the more statistical uses, as classifications were not being widely used for employment services. This might have been true in the early 1980s. It is no longer true in the early 21st century. The development of ever more sophisticated and powerful computers has provided the ability to manipulate large amounts of information quickly and efficiently. This has provided the potential for more 'automation' in employment services. The widespread availability of internet-based job banks, career advice, and other employment services proves conclusively that classification can be used in these applications, and that those responsible are eager to exploit the possibilities. Hoffmann estimated several years ago that about fifty countries had developed occupational classifications to serve client-oriented users (Hoffmann, 1998). The fact that around 90 countries have ratified the Employment Services Convention, (No. 88) of 1958, suggests that more could be interested. However, the majority of the countries ratified the Convention before 1988, at which date there was reportedly limited use of occupational classifications by employment services.

There are indications that, even today, ISCO-88 – and possibly other classifications as well – are not working as well for employment services as for other uses. Thus even in Canada and Australia, despite the commitment to a single classification, different versions of the classification are currently being used for statistical and employment service purposes. In the United Kingdom, the latest revision of SOC included some modifications which were made specifically to address the needs and complaints of employment services users. Some of the differences in expressed needs of statistics bureaux and employment services reflect pressure on the agencies concerned from their users. Some reflect differences in operations – for example, the ease with which they can get, or need, occupational detail.

On the last point, in many countries there has been a demand from employment services for a greater degree of precision in coding. Their motivations are, firstly, to achieve greater precision in the type of jobs on offer and wanted so as to get closer matches and, secondly, to avoid users and service providers having to sift through a great number of possible jobs or applicants.

The demand for greater precision has been met in some countries by adding further digits. However, after investing a great deal of resources in this development, Sweden is now considering abandoning the extra digits. One strong argument against extra digits is that it unnecessarily restricts the options for the individual job seeker, and thus goes against desirable notions of human resource development.

Both France and the Netherlands have tried to avoid restricting choice by devising ways of linking occupations that require similar skills and thus facilitate mobility. In France, the fourth and fifth digit of the ROME code (denoting 'emploi/métier') group together occupations which are judged to be similar in the content of the activity, require common technical competencies, and require similar profiles. ROME also provides for graphical 'pointers' that describe possible career paths between different occupations. In the Netherlands the matching is not built into the coding. Instead, the employment services agency has commissioned teams of skilled occupational analysts to allocate percentage matching scores to pairs of occupations. In time, the agency hopes to be able to devise a computer programme that does this matching automatically. For the foreseeable future, the matching can only be done through painstaking and time-consuming work by experts.

There were some suggestions in the interviews that the demand for a single classification emanates from the more statistical users and, in particular, from Eurostat, while this is not a concern for employment services. One informant stated explicitly that there 'is no advantage for labour market placement' in having a single classification. This seems short-sighted because, as noted above, those dealing with vocational guidance and placement would presumably benefit from having a better understanding of the current shape of the labour market as revealed by surveys and other 'statistical' investigations. Further, with the establishment of more and bigger regional agglomerations across which labour is meant to be mobile, the countries which make up these agglomerations will need to find ways of sharing information about both job seekers and vacancies.

Recommendation 32: *The ILO should promote ISCO-88 as a standard for both statistical and employment service uses, and should educate potential users and developers as to the benefits of a single classification*

Recommendation 33: *The ILO should devote more attention to the employment services uses of ISCO-88. The organisation should attempt, firstly, to assist those who are currently using the classification in developing better systems that utilize the classifications to their full potential. Secondly, the ILO should over time develop expertise and knowledge in this area which can be shared with other countries through publications, manuals, workshops and advice.*

5.4 Providing support

If it is accepted, as suggested above, that the ILO's priority target is countries with limited resources, it can be argued that the ILO needs to provide support beyond the structure of the classification, as reflected in the plans to produce a manual, website and other aids.

Several informants suggested that ISCO-88 documentation needed to be increased. These informants were not necessarily referring only to the needs of less well-resourced countries. They pointed, in particular, to the relatively short introductory section to the main classification document. They suggested that the introduction could provide more information on the conceptual basis, as well as slightly lengthier discussions on sub-topics.

The informants have a valid point, but there are dangers in seeing lengthier documentation as a primary solution. Firstly, in many countries there is a very limited culture of reading. Civil servants who are already overwhelmed by excess piles of papers (and tables, in the case of statistics agencies) might be more reluctant to read lengthier pieces than shorter ones. Language issues, where many people will be reading in a second or third language, add to the problems. Secondly, relying primarily on documentation ignores the teachings of adult education about the relative efficacy of different methods of learning.

The interviews suggested a few examples of activities which could potentially be useful ways of expanding understanding of ISCO-88 and thus promoting better usage.

Firstly, there are workshops where practitioners can get together to discuss their experiences and possible solutions. Informants who spoke about the PHARE workshops organized by IER on behalf of Eurostat and those who participated in the expert meetings which occurred at the time of the development of ISCO-88 all testified to the positive learning experiences which occurred. Even in developed countries, there is usually a very small number of people focusing directly on occupational classifications. In developing countries, there is unlikely to be even one person who has this as their main task. Ending this isolation by promoting interaction between practitioners should increase both interest and understanding.

Workshops are relatively expensive. To maximize the benefits, one would need to find ways to ensure that it is the relevant practitioners who attend, rather than managers or others seeking free trips and perks. One will need to consider who should attend from a particular country, and to what extent different functions and uses are covered in a single workshop. For best results, one might want to aim at two or three participants per country rather than only one delegate from each. One might also want to structure the training as a series of workshops with practical exercises in between in the participants' home countries. While this approach will mean that fewer countries can be covered in a single training exercise, it has more chance of take-up after the event. One might also want to group the countries geographically on the basis that countries in a particular region are likely to share common languages, have similar economies, and be members of the same regional groups.

Further strategies could revolve around timing. For example, if workshops are held a year or two before the census, participants will be more motivated and also more likely to remember what they have learnt because they will be using it within the near future. Where, as in the Southern African Development Community, statistical agencies are already trying to harmonize their approach to the census, the occupational classification events could be slotted into the larger effort.

Workshops generally work best when the number of participants is limited so that each can participate fully. Unfortunately, this limits the possibility of economies of scale. The limited number of occupational classification experts in the world poses further problems given the large number of countries which should ideally participate. One strategy to address these challenges is to develop standardized workshop packages. This will, to some extent, obviate the need for top experts as trainers. It should also assist with the situation where a person is an expert in classification but has limited training skills.

Beyond workshops, several of the countries visited have developed on-line tutorials which focus on different aspects of the classification such as overall concepts or coding. One can probably safely assume that those responsible for developing a classification will have access to a computer with a cd-rom. For many, on-line tutorials might seem a more attractive alternative than reading a manual.

Recommendation 34: *The ILO should explore how to use workshops and other methods of educating and assisting those responsible for occupational classifications in developing countries in performing their tasks.*

5.5 Moving beyond developed and developing

The discussion above has referred at several points to 'developing' and 'developed' countries, or to those who are better or less well resourced. This two-way distinction is a crude one. In thinking about ISCO-88 and the ILO's role, it is more useful to think in terms of at least three categories along a continuum. The one end of the continuum comprises countries such as those visited for these consultancies, i.e. members of the Organisation for Economic Cooperation and Development and those with similarly developed economies and similar level of human, financial and other resources. The middle category comprises middle-income countries such as Philippines, South Africa, Mexico and many others. These countries have economies which include both developed formal sectors and significant informal sectors. They might receive some donor and loan assistance, but are far from reliant on it. They have both human and financial resources, but also have many competing needs which might be considered more important than developing an occupational classification. The third category comprises the least developed countries. These have economies dominated by subsistence and informal sectors, with the public sector dominating the formal sector. They have very limited own sources of funds, poor infrastructure (including electricity and IT), and limited human resources available to develop a classification.

There are ways in which the ILO could engage with all three groups. Among the first group, development and use of the national classifications has proceeded apace. However, the interviews revealed that there are weaknesses in particular aspects, and a lot of duplication of effort in finding ways to solve the problems. In the statistical area, there is room for improvement in areas such as coding, quality control, and updating procedures among others. In the employment services area, there is even more room for sharing of solutions as the area is a much newer one, at least in its computerized form. ILO activity around the needs of these countries would not only assist them, but also free up resources for more coordinated work, and develop standard 'best practice' approaches that could, at a later stage, be used by the other two categories of countries. Expert workshops would stimulate knowledge and interest and generate useful material. The ILO could also consider funding follow-up work in particular countries in a specific area with the 'conditionality' attached that the results of the work be available for sharing with less developed countries.

Among the second group of countries, the ILO could assist with disseminating those lessons from the most developed group which would be most appropriate, as well as imparting the range of skills that are necessary in using a classification effectively. There will be some areas that need particular attention among this group. One possible area is language, as many of these countries are multilingual, and do not have English or any of the other European languages in which classifications have been developed as their main language. Another area is the informal sector. This group might well be the ideal target for the learning workshops suggested in the previous sub-section.

Among the third group, use of an occupational classification is likely to be very limited. With the majority of the population employed in agriculture or the informal sector, the needs are very different from the developed countries. Nevertheless, knowledge about the labour market is important. Many of these countries now have poverty reduction strategy papers (PRSPs) all of which, probably without exception, see economic growth as the route out of poverty. Most will see the development of agriculture as central to their future prosperity. At present the surveys in these countries tend to say little, if anything, about occupation. If occupation is analysed, it is unlikely to be beyond the first few digits.

The first challenge in these countries is to open people's minds to the importance and potential of occupational information. The next challenge is to find 'lite' ways of obtaining and using occupational information within the available IT, human and other resource constraints – ways that do not divert resources that could better be spent on other things.

Recommendation 35: *In planning the promotion of ISCO and devising strategies to support countries in adopting or adapting ISCO-88, the ILO needs to distinguish different groups of countries and devise strategies that are appropriate to each.*

5.6 Timing

Many of informants had heard that a revised ISCO was likely to be completed in 2008. A few spoke about how the timing affected their own plans. The United Kingdom, in particular, was keen that the development of the new version of ISCO be far enough advanced at the time they are revising their own classification for the next census that they can align it as far as possible. Most European countries that have decennial censuses seem to conduct them in the '0' or '1' years of the decade. This is also the case for member countries of the Southern African Development Community, and may be the case in other regions as well. Australia would have liked the new ISCO to have been available to inform the development of ANZSCO but knew that this was now impossible.

Australia also pointed out that the current timetable would mean that few countries would be able to implement a classification based on the new ISCO in the 2010/1 round of censuses. They noted that because ISCO-88 was published in English only in 1990, virtually no countries were able to use it in the censuses which occurred around that time.

Recommendation 36: *The ILO should consider whether there is any way of speeding up the development of the new ISCO, and/or of providing information before it is finalized to countries that want to incorporate new features into the development of their own classifications.*

6. Recapitulation of recommendations

Recommendation 1: There is no reason to move away from the skill level and skill specialisation basis of ISCO-88. There is, however, clearly a need for more education of developers and users as to what these concepts mean.

Recommendation 2: The ILO should research the different ways in which countries are capturing additional attributes beyond skill level and skill specialisation so as to provide guidance as to what is feasible and advisable in this respect for countries with few resources for work on occupational analysis.

Recommendation 3: The ILO should research and disseminate information on the differences in the way countries are conceptualising and measuring ease of transfer and mobility, including the implications for users.

Recommendation 4: Serious thought should be given to coming up with titles for the major groups which are less likely to cause difficulties to speakers of different languages, and which indicate more intuitively what the groups contain.

Recommendation 5: The ILO should investigate whether it is possible to come up with standard tools in at least the main international languages. These tools could then be further adapted by countries for different language usages as well as other country peculiarities.

Recommendation 6: It is probably not feasible to extend the number of unit groups significantly while retaining international applicability. The ILO should rather expend effort in educating developers and users about the underlying philosophy of the classification, and the importance of developing supporting documentation.

Recommendation 7: The ILO should request information from countries using classifications based on ISCO-88 about the type of information that has been coded to the residuals.

Recommendation 8: The ILO's education plan on ISCO should include a focus on residuals. This should stress ways in which residuals can be misused and ways of avoiding misuse, and how information from residual categories can be used in the development of classifications.

Recommendation 9: The ILO should investigate whether it would be useful for ISCO to provide for general categories and whether it is currently forcing a specificity which does not well describe the nature of actual jobs.

Recommendation 10: The ILO should investigate whether the disaggregation used for secretaries in the United Kingdom, or in other countries, is relevant and feasible for an international classification.

Recommendation 11: The ILO should continue to strive to give equal importance and attention to occupations in all segments of the labour force so as to provide a basis on which developers and users can build for their own particular needs and interests. ILO educational material should discuss the advantages of statistical balance, and how this can be achieved when adapting ISCO for national use.

Recommendation 12: Developing a matrix approach to ISCO is not a priority at this stage given that it is likely to involve some disruptive changes to the structural units with relatively limited benefits.

Recommendation 13: The ILO should investigate the different aggregations being used by employment services in different countries and attempt to come up with a set of standard groupings for different applications. The ILO should also consult with EURES (and any similar projects that might exist elsewhere) to explore collaboration.

Recommendation 14: The ILO should not consider the development of alternate aggregation principles in this round of modification.

Recommendation 15: Information technology (IT) is an area that the ILO will need to follow up as it is clearly an area in which ISCO-88 will need to be updated. The ILO could help avoid unnecessary duplication of work by others if it draws on the work done in different countries to date and comes up with a suggested standard method of approaching IT occupations. On the education side, the ILO will need to provide clear documentation of the conceptual issues involved to guide national developers and users of ISCO-88.

Recommendation 16: The ILO should investigate how different countries are dealing with call centre work, and come up with best practice in the area.

Recommendation 17: The ILO should survey the operational rules which different countries have developed to distinguish managers from other workers and amend the ISCO-88 rules, definitions and names of categories if there seem to be more workable solutions than the current one. The survey should include investigation as to how the rules are implemented in practice, for example through coding systems.

Recommendation 18: The ILO should consider whether some supervisory categories need to be reintroduced. It could be that the perceived developments in the labour market on which these categories were abandoned are not as widespread as previously thought. Further, as one informant pointed out, without separate categories for supervisors, it is impossible to measure the extent of such changes.

Recommendation 19: Given the relative silence on the topic of trainees and apprentices, there does not appear to be any need for changing ISCO-88's approach. The issue also concerns status in employment rather than occupation.

Recommendation 20: The wide variation in how agricultural occupations are dealt with in developed countries, the economic importance of the agricultural sector in the developing countries which are most likely to rely on international standards, and the current misfit in terms of ISCO's conceptual framework suggest that the issue should be re-investigated. In particular, it will be important to obtain information from a range of middle-income and low-income countries as to how they are dealing with occupations in both commercial and non-commercial agriculture. A change in ISCO's structure might then be considered necessary.

Recommendation 21: The ILO should spend some time investigating how it should and could cover occupations associated with public administration.

Recommendation 22: The ILO should again suggest to the ICLS that the military not be treated separately, and should develop the arguments as to why this approach is preferable. In addition to pointing out that integration is common in other countries, the ILO could point out that integration will facilitate placement of those who are demobilized, as well as recruitment by the military of those employed outside the military. It will thus facilitate better use of the available human resources of a country.

Recommendation 23: The ILO should investigate the extent to which jobs that are predominantly found in informal sector activities are being covered in statistical collections and, where they are covered, investigate whether classifications have been adapted to adequately reflect such jobs and/or whether they (including ISCO-88) need to be adapted. This work should be given priority as the informal sector is an important component of the economy of many countries, and particularly countries which are unlikely to have the resources to do much work themselves on occupational classifications. As part of its educational activities, the ILO should attempt to stimulate interest in, and understanding of, the informal sector beyond the few countries which currently participate in the Delhi Group.

Recommendation 24: The ILO should promote awareness of the problem of atypical work and advise countries how they can better capture information on atypical work situations. Once this has been achieved, monitoring of the results should reveal whether any changes in the occupational classification are necessary.

Recommendation 25: Given the wide range of attitudes to the recognition of commercial sex work, it does not seem likely that consensus will be reached on this issue. The ILO should thus not attempt to introduce a separate unit group for these workers in ISCO.

Recommendation 26: Work on the manual, website and definitions should be allocated the necessary resources and completed as soon as possible. In the case of the manual, chapters could be published as separate booklets. This would allow for earlier publication of those that are near finalisation, and make the product less intimidating for the user. The ILO should also consider the development of a range of further model tools which could assist users of the classification who have limited resources to develop these from scratch for themselves.

Recommendation 27: The ILO should convene a regular forum of occupation classification experts which would focus on different aspects of development, maintenance and implementation. The forum meetings should take the form of working sessions rather than simply consisting of presentation of conference papers. The meetings should include demonstrations of different solutions. The ILO should document the forums and make the reports available to people working on classifications in other countries.

Recommendation 28: The ICLS should request the ILO to improve and update ISCO-88, and not embark on a major revision of the classification.

Recommendation 29: The ILO should plan for future improvements and updating to occur on a more regular basis than has been the case in the past.

Recommendation 30: The ILO should explore the possibilities of electronic networks which would provide it with up-to-date information about changes in the world of work detected by national agencies.

Recommendation 31: The ILO should accept that many countries will choose to adopt ISCO rather than adapt it. It should devise its support and development strategies accordingly. It should not encourage adaptation or development of a national classification where there are inadequate resources as this is likely to result in a sub-optimal and unfinished product. It should rather concentrate on finding ways of helping those who choose to adopt or adapt ISCO to use it optimally.

Recommendation 32: The ILO should promote ISCO-88 as a standard for both statistical and employment service uses, and should educate potential users and developers as to the benefits of a single classification.

Recommendation 33: *The ILO should devote more attention to the employment services uses of ISCO-88. The organisation should attempt, firstly, to assist those who are currently using the classification in developing better systems that utilize the classifications to their full potential. Secondly, the ILO should over time develop expertise and knowledge in this area which can be shared with other countries through publications, manuals, workshops and advice.*

Recommendation 34: *The ILO should explore how to use workshops and other methods of educating and assisting those responsible for occupational classifications in developing countries in performing their tasks.*

Recommendation 35: *In planning the promotion of ISCO and devising strategies to support countries in adopting or adapting ISCO-88, the ILO needs to distinguish different groups of countries and devise strategies that are appropriate to each.*

Recommendation 36: *The ILO should consider whether there is any way of speeding up the development of the new ISCO, and/or of providing information before it is finalized to countries that want to incorporate new features into the development of their own classifications.*

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