

**THE REVISED INTERNATIONAL STANDARD CLASSIFICATION OF  
OCCUPATION**

**(ISCO-88)**

**A SHORT PRESENTATION**

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## INTRODUCTION

1. The 14th International Conference of Labour Statisticians (ICLS) adopted in November 1987 a revised International Standard Classification of Occupations (ISCO-88) based on a proposal prepared by the Bureau of Statistics of the International Labour Office (ILO). This paper describes the main features and purposes of occupational classifications in general and those of ISCO-88 in particular.
  
2. Founded in 1919 together with the League of Nations, the International Labour Organisation (ILO) is a specialised agency of the United Nations. One of its tasks is to develop international standards and guidelines to help countries improve their labour administration as well as the quality and reliability of their labour statistics, and to improve international comparability of statistical data. To these ends the need for an international standard classification of occupations was first discussed in 1921. However, it was only in 1949 at the Sixth ICLS that work to develop ISCO was initiated. As a result the Seventh ICLS (1949) adopted a provisional classification of nine major groups. In 1952 the ILO published the International Classification for Migration and Employment Placement, with detailed descriptions of 1,727 occupations based on the national classifications of eight industrialised countries. At the Eighth ICLS (1954) a provisional list of minor groups was approved and the Ninth ICLS (1957) completed the work by endorsing the major, minor and unit groups of the first ISCO. It was published in 1958 (ISCO-58) and included, in addition to the group definitions, descriptions of occupational categories within each unit group. It was recognised at the Ninth ICLS that ISCO-58 would need to be revised after a certain time, and a new, revised edition of ISCO was published in 1968 (ISCO-68) with an expanded number of occupational descriptions. The result of the second and most recent revision of ISCO was published in 1989 as ISCO-88.
  
3. The purpose of this paper is to briefly:
  - (a) outline the main user areas of an international standard classification of occupations;
  - (b) present the main considerations and features of ISCO-88;
  - (c) present the follow-up work on ISCO-88 carried out at the national level and by the Bureau of Statistics of the ILO.

In the annex to the paper a brief description of each ISCO-88 major group is given with a list of sub-major and minor groups.

### WHAT IS AN OCCUPATIONAL CLASSIFICATION?

4. An occupational classification is a tool for organising all jobs in an establishment, an industry or a country into a clearly defined set of groups. It will normally consists of two components:

- a descriptive component, which may be just a set of titles of occupations and occupational groups, but which usually consists of descriptions of the tasks and duties as well as other aspects of the jobs which belong to each of the defined groups. These descriptions can be said to constitute a dictionary of occupations;
- the classification system itself, which gives the guidelines on how jobs are to be classified into the most detailed groups of occupations and how these detailed groups are to be further aggregated to broader groups.

5. Occupational classifications can be compared to a system of maps for a country, say Switzerland: the top level of aggregation corresponds to a small scale road map for the main motorways and highways; the next level corresponds to a set of larger scale maps for say each of the main regions, also showing provincial and local roads; and so on. At the most detailed level will be the detailed technical maps used by the municipal engineers to plan sidewalks, traffic lights, road extensions, etc. The very detailed technical maps can be compared to the detailed job descriptions which are used by enterprises for their wage systems and which in many countries will not be the concern of national authorities.

#### WHAT ARE OCCUPATIONAL CLASSIFICATIONS USED FOR?

6. National occupational classifications and dictionaries are usually designed to serve several purposes. Although the detailed occupational descriptions and the classification structure must be seen as to parts of an integrated whole, different user areas have different degrees of interest in the various elements. Detailed occupational descriptions are used by those who need to know about the tasks, duties and working conditions of jobs, i.e. mainly by client-oriented users broadly speaking, (i.e. those responsible for job placement, vocational training and guidance, migration control, etc.). The occupational descriptions should be designed primarily to meet the needs of such users, but should also include the descriptive elements necessary for applying relevant aggregation schemes. The classification structure, i.e. the grouping of the detailed occupations together in progressively more aggregate groups, should be designed mainly to facilitate the sorting of jobs and persons into groups, i.e. for the matching of job seekers and vacancies, or for statistical description and analysis of the labour market and the social structure.

7. Legislators and public sector administrators use occupational statistics in support of the formulation of government policies and to monitor progress with respect to the application of such policies, including those of manpower planning and the planning of educational and vocational training. Managers need occupational statistics for planning working conditions and deciding on manpower policies at the enterprise and industry level. Psychologists study the relationship between occupations and the personality and interests of workers. Epidemiologists use occupation in their study of work-related differences in morbidity and mortality. Sociologists use occupation as an important variable in the study of social differences in life styles and behaviour. Economists use occupation in the analysis of differences in the distribution of earnings and incomes over time and between groups. Depending on the purpose of the study, "occupation" may be regarded as the main variable or it may serve as a background variable in the empirical

analysis. Used as a background variable, it may serve as a proxy for other variables such as socio-economic groups or working conditions, or it may be used as one element in the construction of other variables, such as social class or socio-economic status.

8. ISCO is intended to facilitate international communication on the subject of occupations and occupational groups, narrowly or broadly defined, both for client-oriented and for statistical users. ISCO should therefore lend itself to the different uses at the national level, while taking into account the special considerations which must follow from its international nature.
9. Internationally comparable statistics on occupational groups are used mainly to:
  - (a) compare the distribution of the employed population or some other variable (e.g. wages, hours of work, work accidents, income, consumption, reading habits) over occupational groups in two or more countries;
  - (b) compare data on broadly or narrowly defined individual sets of occupations in two or more countries, for example, to compare the average wages of computer programmers in country "A" with those in country "B", or to compare the number of industrial designers in the two countries;
  - (c) merge data from different countries referring to comparable groups, for example, to obtain enough observations to study the incidence of particular work-related accidents or diseases among workers in broadly or narrowly defined occupational groups, believed to have similar exposure to particular working conditions or harmful substances.

Experience shows that at the international level, most users of occupational statistics need data at the higher level of aggregation - usually for type (a) descriptions. Important exceptions are international studies of earnings, work hazards and injuries and other conditions of work - such studies often require that detailed occupational groups can be defined consistently, sometimes in cross-classification with industry and/or status in employment.

10. It is important to note that while the statistical use of type (a) above requires that the occupational classification cover all types of jobs, the focus in other types of use (statistical or client-oriented) is on specific occupations or groups of occupations. The sum total of these users' interests could conceivably also cover all occupations, but they will in practice only cover a sub-set.

11. The main client-oriented applications of an international standard classification of occupations are in the international recruitment of workers and in the administration of short- or long-term migration of workers between countries. An internationally developed and agreed set of descriptions for detailed occupational categories which can serve as a common "language" for the countries and parties involved in such programmes may greatly increase the effectiveness of the communication necessary for their execution.

12. When countries need a model as a basis for developing or revising their national

classifications, or when a substitute for a national classification is needed in countries that have not developed their own, then an international standard classification may be a good alternative. These applications of ISCO have been kept in mind both in the original development of ISCO and in its subsequent revisions.

### KEY CHARACTERISTICS OF ISCO-88

13. The recent revision of ISCO aimed to produce an international classification which would:

- have a firm and clear conceptual basis - to strengthen its usefulness as a descriptive and analytical tool and to make it easy to update with new occupations;
- reflect the labour markets of developing as well as of industrialised countries;
- better reflect women's position in the labour market;
- reflect occupational consequences of different technologies;
- incorporate new occupations and reflect shifts in the relative importance of occupational groups.

14. In the present context a job is defined as a set of tasks and duties which are (or can assigned to be) carried out by one person. Most occupational classifications classify, i.e. group together in occupations and more aggregate groups, jobs by similarity of the type of work done. Persons are classified by occupations through their relationship to a past, a present or a future job. In ISCO-88 occupations are grouped together and further aggregated mainly on the basis of the similarity of skills required to fulfill the tasks and duties of the jobs. Two dimensions of the skill concept are used in the definition of ISCO-88 groups: Skill level, which is a function of the range and complexity of the tasks involved, where the complexity of tasks has priority over the range; and skill specialisation, which reflects type of knowledge applied, tools and equipment used, materials worked on, or with, and the nature of the goods and services produced. It should be emphasised that the focus in ISCO-88 is on the skills required to carry out the tasks and duties of an occupation - and not on whether a worker having a particular occupation is more or less skilled than another worker in the same occupation.

15. Only a few broad "skill level" categories can usefully be identified for international comparisons. The International Standard Classification of Education (ISCED) has been used to define skill levels. This does not mean, however, that skills can only be obtained by formal education or training. Most skills may, and often are, acquired through experience and through informal training, although formal training plays a larger role in some countries than in others and a larger role at the higher skill levels than at the lower - see also paragraph 21 below. For the purpose of the ISCO classification system, the decisive factor for determining how an occupation should be classified is the nature of the skills that are required to carry out the tasks and duties of the corresponding jobs - not the way these skills are acquired.

16. "Skill specialisation" can be indicated both broadly and more narrowly and is related to subject matter areas, production processes, equipment used, materials worked with, products and services produced, etc. The words used to describe subject matter, production processes, etc. therefore have to be used as labels for the core sets of skills with which occupations are concerned. The same type of words are used to describe the groups in an industrial classification of production activities. For some workers it will therefore be possible to "predict" the occupation in which they are working with a fairly high degree of success, knowing how they are classified by industry. This does not mean that ISCO is using industry as a classification criterion (except in a few cases where it is directly relevant): the reason is that skills in fact are linked to products, materials, etc. which are the determinants of the "industry" of the establishment in which the work is carried out. The conceptual difference between the two types of classifications should not be forgotten, even though it may be partly obscured by the correlation between them and by the terminology used.

17. ISCO-88 defines four levels of aggregation, consisting of:

10 major groups

28 sub-major groups (subdivisions of major groups)

116 minor groups (subdivisions of sub-major groups)

390 unit groups (subdivisions of minor groups)

Unit groups in most cases will consist of a number of detailed occupations. For example, as a separate occupation nuclear physicist belongs to ISCO-88 unit group 2111 Physicists and astronomers, which belongs to minor group 211 Physicists, chemists and related professionals, which is part of sub-major group 21 Physical, mathematical and engineering science professionals of the major group 2 Professionals. The structure of ISCO-88 is shown in Table 1, and the major groups are briefly described in the annex to this paper.

18. Eight of the ten ISCO-88 major groups are delineated with reference to the four broad skill levels defined for ISCO, cf. table 1. Five of the eight major groups, i.e. 4, 5, 6, 7 and 8, are considered to be at the same broad skill level and are distinguished by reference to broad skill specialisation groups. Skill level references were not made in the definitions of the two major groups entitled Legislators, senior officials and managers and Armed forces respectively, because other aspects of the type of work were considered more important as similarity criteria, i.e. policy making and management functions, and military duties, respectively. As a result there are significant skill level differences within each of these two major groups. However, the sub-major and minor groups of major group 1 have been designed to include occupations at similar skill levels.

Table 1: ISCO-88 major groups, number of sub-groups and skill level

Major group ISCO	Sub-major	Minor	Unit
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		groups	groups	groups	skill level
1					
1	Legislators, senior officials and managers	3	8	33	-
2	Professionals	4	18	55	4th
3	Technicians and associate professionals	4	21	73	3rd
4	Clerks	2	7	23	2nd
5	Service workers and shop and market sales workers	2	9	23	2nd
6	Skilled agricultural and fishery workers	2	6	17	2nd
7	Craft and related workers	4	16	70	2nd
8	Plant and machine operators and assemblers	3	20	70	2nd
9	Elementary occupations	3	10	25	1st
0	Armed forces	1	1	1	-
	Totals	28	116	390	

19. A distinction is made at the major group level between (a) occupations that are essentially craft-oriented (i.e. major group 6 "Skilled agricultural and fishery workers" and 7 "Craft and related trades workers"), and (b) occupations that are essentially oriented towards the operation of tools, machinery and industrial plants (i.e. major group 8 "Plant and machine operators and assemblers") - to cope with the issue of different skill requirements for jobs with similar purposes, due to differences in technologies used.

20. Occupations which are craft oriented consist of skilled jobs directly involved in the production of goods or services, where the tasks and duties require an understanding of and experience with the natural resources and raw materials used and how to achieve the desired result. The workers in these jobs may also use more technologically advanced tools and machines, provided that this does not change the basic skills and understanding required. Modern machines and tools may be used to reduce the amount of physical effort and/or time required for specific tasks, or to increase the quality of the products.

On the other hand the tasks and duties of jobs in occupations which are oriented towards the operation of tools, machinery and industrial plants require an understanding of the machines: how to operate them properly, how to identify malfunctioning and what to do when something goes wrong. The skills required are oriented towards the machines and what they are doing rather than to the transformation process as such or its results. Occupations where the tasks and duties consist of assembling products from component parts according to strict rules and procedures are considered to belong to the same major group as the machine-oriented occupations. Jobs which only require low or elementary skills and little or no judgement are classified to occupations in major group 9.

21. The 14th ICLS decided that for international comparisons it should be possible to reflect in ISCO the important differences which exist between countries, and sometimes within a country, in the required skill levels of jobs which traditionally have been seen as belonging to the same occupational group. Such differences are linked to the actual tasks which are carried out as these, although similar in nature, may vary significantly in the degree of judgement, responsibility and planning required. These differences in tasks will have resulted in national differences in skill levels and qualifications required for entering the occupations. The 14th ICLS therefore decided that ISCO-88 should make it possible for countries to classify some occupational groups either to major group 2 "Professionals" or to major group 3 "Technicians and associate professionals", depending on national circumstances. This possibility was created for primary, pre-primary and special teaching occupations, nursing and midwifery occupations, social work occupations and some artistic occupations.

22. The 14th ICLS also decided that, as in ISCO-68, jobs in the armed forces should be classified in a separate major group 0 "Armed forces", even if the jobs involve tasks and duties similar to those of civilian counterparts.

23. All occupations which consist of jobs in which the workers have mainly legislative, administrative or managerial tasks and duties should be classified to major group 1 "Legislators, senior officials and managers". In ISCO-68 they were partly classified to major group 2 (Administrative and Managerial Workers) and partly to other major groups.

24. "Working proprietors" are to be classified according to whether their tasks and duties are mainly similar to those of managers and supervisors or to those of other workers in the same area of work. This is because the status of "working proprietor" is seen as related not to type of work performed but to "status in employment" - corresponding to the "self-employed" and "employer" categories of the International Classification of Status in Employment (ICSE). However, one self-employed "plumber" may have mainly managerial tasks but another may carry out the tasks of "plumber" with very few managerial responsibilities, depending for example on the size of the firm. In the former case the job should be classified with managers and in the latter case with "plumbers".

25. In ISCO-88 both "apprentices" and "trainees" should be classified according to their actual tasks and duties as, if needed, these two groups may be separately identified through the "status in employment" classification. ISCO-68 recommended that apprentices should be classified to the occupation for which they are being trained, but

that trainees be classified according to their actual tasks and duties.

26. The problem of classifying jobs which have a broad range of tasks and duties should be handled by the application of priority rules, i.e. some tasks and duties are given priority in determining the occupational category to which a job should be classified, such as:

- (a) in cases where the tasks and duties are associated with different stages of the process of producing and distributing goods and services, the tasks and duties related to the production stages should take priority over associated tasks and duties, such as those related to the sale and marketing of the same goods, their transportation or the management of the production process (unless either of these associated tasks and duties dominates). For example, the worker who bakes bread and pastries and then sells them should be classified as "baker", not as "sales assistant"; the worker who operates a particular type of machinery and also instructs new workers in how to operate the machine should be classified with the machine operators; the taxi driver who drives his/her own car and also keeps the accounts should be classified with motor-vehicle drivers; and
- (b) in cases where the tasks and duties performed require skills usually obtained through different levels of training and experience, jobs should be classified in accordance with those tasks and duties which require the highest level of skill. For example: there are a number of jobs whose tasks and duties most of the time require a set of relatively easily obtained skills, but where the workers are also expected to have skills which require more training or experience which enables them to cope with unexpected and infrequent situations, for instance, to avoid accidents or injuries.

It is recognised that a certain amount of judgement and adjustment to national circumstances will be necessary in the choice and application of these priority rules.

27. Many users of the 1968 ISCO found that its top aggregation level of nine groups meant that the differences within each group were too large for the groups to be useful for description and analysis. However, the next level of aggregation, with 83 groups, represented too much detail for many types of analysis, as well as for international reporting of occupational distributions, especially if the data are obtained through sample surveys. ISCO-88 therefore includes the "sub-major" groups as a new level in the aggregation system - between the former major and minor groups, cf. table 1.

#### COMPARISON WITH ISCO-68

28. In all areas of statistics it is important to achieve a balance between continuity of time series and needed adjustments and improvements in definitions, in methods of data collection and in classification systems. In developing ISCO-88, continuity was aimed for at the unit group level. The revision did, nevertheless, result in the splitting of a significant number of ISCO-68 unit groups. The numerical importance of many of these splits at the country level need not be important.

29. The unit group level is the most detailed level specified in the ISCO-88 structure.

The previous versions of ISCO also specified a detailed set of occupational categories, although they were not discussed or approved by the ICLS. Those of the detailed ISCO-68 descriptions which are still relevant are made available to the users of ISCO-88 on diskette, upon request.

30. The emphasis on skill level and skill specialisation as the main similarity criteria for the delineation of occupational groups in ISCO-88 is not such a dramatic change from ISCO-68 and related national classifications as it may seem. That skill was implicitly used in ISCO-68 can be seen through a closer analysis of its classification system. For example, the group 0/1 (Professional, Technical and Related Workers) contains occupations with tasks and duties which require, for the most part, highly trained or skilled workers. Occupations of comparable skill requirements are otherwise only found in its major group 2 "Administrative and managerial workers". Each of the other major groups in ISCO-68 covers different broad areas of skill specialisation. For example, most of the occupations in major group 3 "Clerical and related workers" mainly require skills needed to deal with data and information, while most of the occupations in major groups 4 and 5 "Sales workers" and "Service workers" can be said to mainly require skills needed in dealing with people. Similarly the distinctions between different minor and unit groups within a major group can be seen as distinctions between different skill specialisations. Skill level is explicitly discussed in the introduction to ISCO-68 in relation to minor group 9-9 (Labourers not elsewhere classified). The conclusion that skill implicitly plays an important role in both ISCO-58 and ISCO-68 is also supported by the following quotation from the Introduction to ISCO-58:

... combinations (of occupations) may be based on materials worked on, workplace, environment, the specialised equipment used (if any) and similar relationships. The particular skills, knowledge and abilities of the workers concerned have an intimate connection with such factors.

31. ISCO-88 consists of ten (nine) major groups, followed by 28 sub-major groups, 116 (83) minor groups and 390 (286) unit groups. (The number of ISCO-68 groups are given in parenthesis.) When coding ISCO-68 groups to ISCO-88 we find that 55 per cent of the ISCO-68 unit groups (157 out of 286) have been left unchanged or have had their scopes only slightly expanded or reduced. Fourteen of the new unit groups have been created by combining two or three ISCO-68 unit groups - using a total of 31. The coding also shows that 96 ISCO-68 unit groups were split - and that the parts were coded to 174 different ISCO-88 unit groups. Twenty-four of the split groups were "not elsewhere classified" groups. A total of 32 ISCO-88 unit groups contain no reference to any ISCO-68 unit groups or occupational categories. ILO, 1987, ILO, 1988 and ILO, 1990 should be consulted for further information about ISCO-88.

#### FOLLOW-UP WORK ON ISCO-88

32. Publications presenting ISCO-88 are available in English (1990), French (1991) and Spanish (1991). In addition to presenting the main principles and the treatment of special groups of jobs, they include descriptions of all ISCO-88 groups and updated and revised versions of the "Expanded alphabetical list of titles" in ISCO-68 - with about 3,700 entries in the English volume, 2,800 in the French volume and 3,100 in the Spanish.

The updating of these lists have used information obtained from national dictionaries of occupations in the three languages, as well as information obtained from experts in relevant areas. All entries in the updated lists have been coded to the most detailed groups of ISCO-88 and ISCO-68. The full text of the three publications, including the indexes, is available in machine-readable form, as are the descriptions of still relevant ISCO-68 occupational categories. The latter descriptions have been slightly edited but not updated.

33. A Manual on the development and use of national occupational classifications and dictionaries will cover both client-oriented and statistical applications. Work on the Manual has taken much longer than expected, but it is planned for publication in 1994.

34. The Manual will discuss much more explicitly than has been done in the past the collection and processing of occupational responses to questions on both administrative forms and statistical questionnaires. The aim is to contribute to better and more uniform occupational statistics, both for those using ISCO-88 directly and for those using other occupational classifications for possible later linkage to ISCO-88 groups. This will improve the usefulness of occupational data both nationally and for international comparisons and communication. The need for well designed and tested occupational questions are emphasised, as well as the fact that experience and experiments have shown that the best results are obtained when asking for both the occupational title of a job and for a brief description of the main tasks and duties. Guidance is given on how to train coders, control the coding process and ensure that coders receive feedback on their performance. The importance of a good index of occupational responses and the way such indexes should be created and used is explained. It is recommended that coding always should be carried out at the most detailed level supported by the information given by the respondent. Available evidence indicates that this strategy involves small marginal costs, in terms of coding errors and time used per response, compared to that of coding at a predetermined aggregation level. It is also recommended that the coding should distinguish clearly between responses which are incomplete and the "not elsewhere classified" categories for particular occupations.

35. In discussing the mapping from national occupational classifications to ISCO-88, the recommended strategy is consistent with the coding strategy outlined above: Mapping should be carried out at the lowest level of aggregation of each of the two classifications, i.e. the national occupational classification - which for many countries may be an only slightly modified version of ISCO-68 - and ISCO-88. Priority rules are specified for resolving problems of inconsistency between the two classifications.

36. The work programme and budget of the ILO Bureau of Statistics provide for the minimum amount of resources necessary for the ILO to maintain competence in the field of occupational classification. These limited resources will mainly be used to:

- (a) provide technical advice on the development and use of national occupational classifications, whether or not they are based on ISCO-88. This technical advice may take the form of responding to simple requests for information or comments to draft plans or classifications, assisting in the preparation of plans to develop or revise national classifications or the backstopping of such projects;

- (b) provide technical advice on the development of links between ISCO-88 and other occupational classifications, national and international;
- (c) revise existing and develop new detailed occupational descriptions for priority areas;
- (d) set up and run a small documentation centre and information service on national occupational classifications and their links to ISCO, and on activities relevant to the development of occupational classifications and their use.

So far work has been concentrated on activities (a) and (d).

37. It was originally expected that countries would want to consult the ILO on how to map their current occupational classifications into ISCO-88, in preparation for the requests for data according to this classification from the international community. This has not yet happened to the expected extent, probably because countries are waiting until they actually receive such requests. More countries than expected have initiated activities to develop or revise their national classifications according to the principles of ISCO-88 or by using ISCO-88 as a model. Australia should be mentioned first because it pioneered the approach used by ISCO-88 as well as provided much of the methodological basis both for its development and for guidelines on its implementation. Other OECD countries which now has ISCO-88 compatible classifications are New Zealand, the United Kingdom, Ireland and Italy, and we know that work is going on in Denmark, Iceland, Norway, Portugal and Spain, and is about to start in Sweden. Work to develop ISCO-88 based classifications has also started in many of the transition countries in central and eastern Europe and the former Soviet Union: Bulgaria, the Czech and Slovak Republics, Hungary, Poland, Romania, Slovenia, the Baltic states and Ukraine. Other countries which already have ISCO-88 based occupational classifications include Barbados, Cyprus, Hong Kong, Papua New Guinea, Singapore, Tanzania and Trinidad & Tobago, while we have been informed that work has started in Fiji, India, Israel, the Phillipines, and Namibia. Initiative has been taken to develop a common ISCO-88 adaptation for the Pacific islands countries and a common statistical classification, ISCO-88(COM), has been developed for members of the European Community. This variant of ISCO-88 will also provide a framework for the EC work to revise and develop instruments to be used to facilitate labour mobility and the recognition of vocational and professional training within the Community. Some countries which recently have chosen to revise or update their national occupational classifications with little or no reference to ISCO-88, are: Canada, France, Germany, the Netherlands and Switzerland. The United States is carefully considering what role ISCO-88 should play in their forthcoming work to revise the U.S. SOC.

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