



19th International Conference of Labour Statisticians
Geneva, 2-11 October 2013

Room Document: **1**

**The case to update or revise the
International Standard Classification of
Occupations, 2008 (ISCO-08)**

Abbreviations

GTCI	Grupo Técnico Sobre Clasificaciones Internacionales (UNECLAC Working Group on International Classifications)
ICLS	International Conference of Labour Statisticians
ICSE	International Classification of Status in Employment
ICT	Information and Communications Technology
ILO	International Labour Organization
ISCED	International Standard Classification of Education
ISCO	International Standard Classification of Occupations
ISCO-08	International Standard Classification of Occupations, 2008
ISCO-88	International Standard Classification of Occupations, 1988
ISIC	International Standard Industrial Classification of All Economic Activities
LFS	Labour Force Survey
OECD	Organisation for Economic Co-operation and Development
SEO	Search Engine Optimization
SNA	System of National Accounts
UN	United Nations
UNECLAC	United Nations Economic and Social Commission for Latin America and the Caribbean
WHO	World Health Organisation

The case to update or revise the International Standard Classification of Occupations, 2008 (ISCO-08)¹

ILO Department of Statistics

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1. Introduction and Background

Introduction

1. The current version of the International Standard Classification of Occupations (ISCO) was adopted through a resolution of a tripartite Meeting of Experts on Labour Statistics in December 2007, and subsequently endorsed by the ILO Governing Body in March 2008. Accordingly it is known as ISCO-08. Its adoption by a meeting of experts was mandated, exceptionally, by a resolution of the 17th ICLS.
2. ISCO-08 is a four-level hierarchically structured classification that aims to allow all jobs in the world to be classified into 436 unit groups. These groups are aggregated into 130 minor groups, 43 sub-major groups and 10 major groups, based on their similarity in terms of the skill level and skill specialisation required for the jobs.² It is the accepted international reference classification for occupational information.
3. The main purposes of ISCO-08 are to provide:
 - a. A basis for the international reporting, comparison and exchange of statistical and administrative information about occupations;
 - b. A model for the development of national and regional classifications of occupations;
 - c. A system that can be used directly in countries that have not developed their own national classifications.
4. For the main international reference classifications, the UN Expert Group on International Statistical Classifications has specified that the relevant governing authority should consider at least every five years, a review outlining the case for a revision, update or no change³. The Expert Group envisages two possible types of change to international classifications: the *revision* and the *update*.
5. A *revision* implies major changes that would entail one or more of the following:
 - a. Renumbering of all or a substantial portion of the classification structure;
 - b. Restructuring and regrouping a substantial portion of the classification;
 - c. New concepts for defining groups at one or more levels of the classification hierarchy (such as the application of a consistent concept throughout the classification).
6. An *update* implies a more limited set of changes. The types of change envisaged in an update are:

² See ILO 2012 for a complete description of the ISCO-08 structure and conceptual model.

³ UN, 2011

- a. Addition or removal of a category at the most detailed level of the classification within the existing structure;
 - b. Realignment of the content of categories (e.g., one occupation moves from one unit group to another in ISCO);
 - c. Multiple categories are added or removed from the most detailed level of the classification but the basic structure remains substantially unchanged.⁴
7. In line with these recommendations, this paper summarizes the issues that may justify work to update or revise ISCO-08, in order to assist the 19th ICLS in determining whether or not there is a need undertake a minor update of ISCO-08 in the short term, or to start planning for a longer term revision to be completed after the 20th ICLS. Some of the issues could only be addressed in the context of a full revision of ISCO-08, whereas others could be addressed as part of a more limited update as described above in paragraph 6.
8. To ensure that the problems identified were as comprehensive as possible, the ILO circulated a short paper, describing the main issues that the ILO was aware of, to selected national and international experts on occupation classification. The experts commented on these issues and on the potential solutions to the problems identified, and also provided advice on additional issues that may need to be addressed. These comments are reflected in the discussion in Section 2 below. The paper first briefly describes progress with implementation of ISCO-08 and then summarises and discusses the issues and the potential options to address them.

Progress with implementation of ISCO-08

9. The ILO has provided support for the implementation of ISCO-08 through a variety of means. These include participation in meetings Eurostat task forces and working groups on classifications and in the Working Group on International Classifications (GTIC) for member countries of the Economic Commission for Latin America and the Caribbean (ECLAC). The ILO also provides advice on implementation issues and resolution of cases that are difficult to classify on a discussion forum on the implementation of ISCO-08 hosted by Eurostat but open to all countries in the world, and on the GTIC discussion forum. Assistance and training is also provided through regional and national training workshops, direct technical assistance to countries, and the development and release of relevant documentation.
10. *ISCO-08 Volume 1, Structure, Group Definitions and Correspondence Tables*, was published in English in May 2012. The detailed definitions of groups included in this publication are based on material released on the ILO Website in July 2009. These definitions were updated and clarified in a number of areas in the light of comments received from agencies that used the earlier material to assist in developing or updating of national occupation classifications. Volume 1 also includes methodological notes that provide advice on the application of ISCO at national level. It is anticipated that French, Spanish and Russian versions of Volume 1 will be released in 2013. It is hoped to produce an Arabic version in collaboration with Kingdom of Saudi Arabia. In all cases the translated text has been circulated to relevant countries for comment prior to publication.

⁴ Murphy, J and Franco, A

11. The ISCO-08 Index of Occupational Titles is to be presented as a separate volume and will be released in several languages. At the time of writing, English and French versions are at an advanced stage of development.
12. Many countries have now adapted national occupation classifications to improve comparability with ISCO-08, have developed national classifications based on ISCO-08, or have developed correspondence tables that will allow them to report data according to ISCO-08. ISCO-08 has been used in all relevant European Union collections from 2011 onwards.
13. Feedback on the usefulness of the classification has generally been positive. There are several cases, however, where more detail has been requested, or where it is felt that the treatment of particular occupational groups is inadequate. In addition there are concerns that the way in which the concept of skill level was applied to the design of both ISCO-88 and ISCO-08 imposes limitations on the usefulness of ISCO for the purposes of analysing and measuring things like the oversupply and undersupply of skilled workers.

2. Issues that might be addressed in the event of a revision or update of ISCO-08

14. This section presents a summary of the issues that could be addressed as part of a revision or update of ISCO-08. Several issues are mainly concerned with the measurement of skill level and would require a significant change in the application of the ISCO conceptual model to the design of the classification, although the key underlying concepts would not need to change. They could therefore only be addressed in the context of a major revision of ISCO-08. The remaining issues, however, could possibly be addressed as part of a minor update. They mainly involve the splitting or merging of some unit groups and/or the movement of numerically relatively small occupations between more aggregate groups. Such changes would only have a small impact on time series comparability for aggregate data. The optimal solution for some of the issues identified; however, would potentially involve changes such as the creation of a new minor group that might go slightly beyond the three types of change envisaged as part of an update and described in paragraph 6 above, but may not be as extensive as those described in paragraph 5.

Issues that could only be addressed in a full review

Use of ISCO for the measurement of skills mismatch

15. In 2008, the 18th ICLS discussed the use of skills mismatch as a potential indicator or component of the measurement of labour underutilization. The concept of skills mismatch was seen in this context as a measure of persons whose skills were underutilized, defined as persons whose educational level exceeded the skill level required by their current job.⁵ Since the term 'skills-mismatch' could refer both to the oversupply and to the undersupply of workers with suitable skills, the term 'skills underutilization' has been used in subsequent papers discussing this issue. Educational level and skill level were to be considered in terms of the International Standard

⁵ ILO. 2008.

Classification of Education (ISCED) and ISCO respectively.⁶ In the Resolution concerning the development of measures of labour underutilization the 18th ICLS recommended that the ILO work on the development of a methodology for the measurement of labour slack, low earnings and skills mismatch.

16. At the ILO technical workshop on measures of labour underutilization held in December 2009, participants expressed concerns, however, about the use of ISCO and ISCED as the basis for the measurement of skills underutilization. Some of these concerns were related to difficulties in keeping ISCO up-to-date in terms of skill level requirements or to difficulties in drawing a line between some jobs on the basis of skill level as defined in ISCO. In view of the practical and conceptual difficulties with the measurement of skills underutilization/mismatch cited by participants in this workshop and subsequently by members of the ILO Working Group for the Advancement of Employment and Unemployment Statistics, priority was given to the development of measures of labour slack as part of the overall ILO work on the development of measures of labour underutilization.
17. The need for an internationally harmonized method for the measurement of skills underutilization has not gone away, however, and remains a high priority. Measurement is needed both as an indicator of labour underutilization and to support analysis of problems of supply and demand of skilled labour. Any work to review or update ISCO-08, or decision about the need to undertake such work, would therefore need to take into consideration the suitability of the classification for the measurement of skills underutilization.
18. The other aspect of skills mismatch is related to shortages of skilled workers. Analysis of skill shortages is concerned with the number of workers who are not adequately qualified for the jobs in which they are employed, and with the number of job vacancies that cannot be filled due to the lack of appropriately qualified persons. At the macroeconomic level labour economists are concerned with potential bottlenecks that impose limitations on national capacities for economic development due to the unavailability of a suitably skilled and educated population. A number of recent international studies related to skill shortages suggest that there is a need for a more refined measurement of skill level in internationally comparable data classified by occupation.
19. Some experts in occupation classification have pointed out, however, that measuring skills mismatches is inherently difficult. It raises a number of problems beyond the need for data at a more detailed level, especially the need to determine who is overqualified for a certain position. Moreover, the basis for defining skill level lies in the nature of the tasks performed in relation to characteristic tasks defined for each skill level. There is not always strong link between the occupational skills required and the formal educational level of the job holder. A further refinement of the four skill levels for use in studies on skills mismatches may therefore be difficult to operationalize on an empirical basis. There are doubts, therefore, that the comparability between countries of the currently used occupational skill levels would benefit from further refinement.

⁶ See also Sengenberger, W and 18th ICLS Room document no 13.

Breadth of Skill level 2

20. The major groups in ISCO-08 are defined in terms of four broad skill levels as shown in Table 1. The first issue relates to the breadth of one of these skill levels - Skill Level 2. According to the ISCO-08 Introductory and Methodological Notes:

The knowledge and skills required for competent performance in occupations at Skill Level 2 are generally obtained through completion of the first stage of secondary education (ISCED-97 Level 2). Some occupations require the completion of the second stage of secondary education (ISCED-97 Level 3), which may include a significant component of specialized vocational education and on-the-job training. Some occupations require completion of vocation-specific education undertaken after completion of secondary education (ISCED-97 Level 4).⁷

21. As a result, the distinction between occupations that require completion of extensive vocational education and training, and those that require a short period of training plus basic literacy and numeracy is not made systematically. Occupations in Major groups 4 – 8 are all considered to be at Skill Level 2, as shown in Table 1 below.

Table 1 Mapping of ISCO-08 major groups to skill levels

ISCO-08 major groups	Skill level
1 Managers	3 + 4
2 Professionals	4
3 Technicians and Associate Professionals	3
4 Clerical Support Workers 5 Services and Sales Workers 6 Skilled Agricultural, Forestry and Fishery Workers 7 Craft and Related Trades Workers 8 Plant and Machine Operators, and Assemblers	2
9 Elementary Occupations	1
0 Armed Forces Occupations	1 + 2 + 4

22. Occupations that vary significantly in skill level but are similar in skill specialization, are frequently grouped together, sometimes at the most detailed level of the classification. This limits the usefulness of the classification for analysis of skill level requirements, of skill mismatch, of income as a return to education, of educational planning and for the measurement of socio-economic status. The problems with home improvements installers and vehicle accessory fitters discussed below are a reflection of this problem.

⁷ ILO 2012

Boundary between Skill Levels 2 and 3

23. Some experts have reported that there are problems with the boundary in skill level between some of the more skilled technical occupations classified at Skill Level 2, and occupations at Skill Level 3 included in Major Group 3, Technicians and Associate Professionals. This refers primarily to some of the more technical occupations in Major Group 7, Craft and Related Trades Workers, where technological changes are leading to higher knowledge and skill requirements. Occupations concerned with vehicle and aircraft maintenance or electrical, electronics and telecommunications installation and maintenance are good examples.

Approaches that could be taken to address problems with the application of skill level as a classification criterion

24. We have identified four possible approaches that could be taken to address the limitations of ISCO-08 arising from the way in which the concept of skill level has been applied to the design of the classification. None of these approaches would require a fundamental change to the conceptual underpinnings of the classification. All would lead to significant structural changes, however, including at the top level of the classification. These four approaches are summarised below.
- i. The first approach would involve moving the boundary between Skill levels 1 and 2 so that basic clerical support occupations, sales assistants, accessory installers and most plant and machine operators and drivers would be classified at Skill level 1. Some of these occupations would be moved to Major Group 9, Elementary Occupations. The more skilled occupations in the current Major group 8 would have to be moved to Major group 7. All occupations in the new Major group 8 would be associated with the new Skill level 1.
 - ii. The second approach would involve the application of five (instead of four) skill levels at unit group level. This could be achieved by splitting the current Skill level 2 without changing the boundaries with other skill levels. Each unit group in Major groups 4, 5, 6, 7 and 8 could then be associated with a single skill level, within the framework of the current major and minor group structure. Some unit groups would have to be split, in the same way as we propose below for vehicle accessory fitters.
 - iii. The third option would also involve the creation of five skill levels as described above. In this case the skill level distinction would be applied primarily at major group level, so that data on skill level could be compiled on the basis of aggregate statistics. The occupations currently classified in Major groups 4 and 5 would be allocated to major groups according to skill level instead of skill specialisation. As with the second option the more skilled occupations in Major group 8 would have to be moved to Major group 7.
 - iv. The fourth option would involve moving the boundary between Skill Levels 2 and 3 so that the more highly skilled occupations within the current Skill Level 2 would be classified at the new Skill Level 3. For example some of the occupations that typically require extensive vocation-specific training after the completion of secondary education might be classified at Skill Level 3. The main result of this would be that some occupational groups would be moved from Major Group 7 to Major Group 3. Some occupations in Major Group 4, Clerical Support Workers could also be affected. The

movement in the boundary between Skill Levels 2 and 3 could be undertaken either independently of other changes or in combination with one of the other three options discussed above.

Issues that could be potentially addressed in the context of a minor update of ISCO-08

Hospitality and retail managers

25. There is concern that Minor Group 141, Hotel and Restaurant Managers and Minor Group 142, Retail and Wholesale Trade Managers, are too heterogeneous in terms of skill level. The managers of large establishments with hierarchies of managers, as well as the managers of relatively small retail and hospitality businesses are classified in the same group. Since occupation titles such as ‘Hotel Manager’ and ‘Shop Manager’ may frequently be used to describe both groups, it is difficult to find an easy solution to this problem but there is clearly a need for further investigation of the options.

Supervisors

26. ISCO-08 includes six unit groups for supervisory occupations in specific sectors where supervisors do not mainly perform the same tasks as the workers they supervise. All other supervisory occupations are classified in the same unit group as the most skilled occupation supervised. Some experts consider that there is a need for additional supervisory unit groups, especially in the services sector.

Company secretaries and corporate governance specialists

27. The Institute of Chartered Secretaries and Administrators has suggested the need for a separate category for chartered or company secretaries and corporate governance professionals. Company secretaries are currently classified in Unit Group 1211, Finance Managers. A number of commentators have observed that this treatment may be problematical. If there is a need for a separate category, the potential options would appear to create an additional unit group either in Minor Group 121, Business Services and Administration Managers, or in Minor Group 242, Administration Professionals. Since a number of countries have reported the numbers employed in these occupations are relatively small, it may be difficult to justify the creation of a separate unit group, however.

Specialist medical practitioners (Unit group 2212)

28. Some users have identified a further breakdown of specialist medical practitioners by specialty. This could be achieved by splitting unit group 2212 into several groups in line with current practice in the adaptation of ISCO-08 used in the WHO/OECD/Eurostat health work force collection. The groups of specialist medical practitioners separately identified in this collection are:

- General paediatricians
- Obstetricians and gynaecologists
- Psychiatrists
- Medical group of specialists

- Surgical group of specialists
- Other specialists not elsewhere classified⁸

Oral and maxillofacial surgeons

29. Representatives of oral and maxillofacial surgeons in Europe are dissatisfied with their inclusion in Unit Group 2261 Dentists. This is inconsistent with EU regulation which recognizes them as medical specialists. In North America and many other regions they are grouped with dental practitioners. Several ways to resolve this problem could be envisaged. These could include: (1) separate identification within minor group 221 Medical Doctors; (2) renaming of unit group 2261 to reflect the inclusion of oral and maxillofacial surgeons ; (3) creation of a new minor group of Dental and Related Medical Specialists including a separate unit group for oral and maxillofacial surgeons, possibly including some other specialised dental occupations; (4) inclusion of the group without separate identification in Unit group 2212, Specialist Medical Practitioners; or (5) separate identification within Minor group 226 other Health Professionals.

Medical technologists

30. There has been strong representation from the Pan-American Association of Medical Technologists to the effect that the inclusion of some medical technologists in minor group 321 Medical and Pharmaceutical Technicians does not reflect their skill level. Depending on the discipline, some medical technologists are already classified in Minor Group 226, Other Health Professionals. A number of possible ways of dealing with this issue could be identified, depending on the outcome of further investigations into the nature of the work performed by medical technologists.

Information and communications technology specialists

31. An updated and expanded set of categories was provided in ISCO-08 for occupations involved in the provision of goods and services in information and communications technology (ICT). These categories reflected the rapidly evolving occupational structures that emerged during the revolution in ICT that occurred during twenty years following the development of ISCO-88. There is concern, however, that the boundaries between some of the categories are blurred and that jobs may frequently be classifiable to several different groups, in a sector whose occupational structures and skill requirements remain fluid.
32. There may, for example, be a need to determine whether an increasing number of jobs in ICT referred to as "architects" (enterprise architect, solutions architect, software architect, network architect, systems architect ...) are adequately covered by the existing unit groups or reflect new or emerging occupations. Similarly, there may be a need to determine whether new social media occupations are emerging at the boundary between ICT and the world of marketing and advertising (search engine optimization (SEO) specialist, SEO strategist, on-line community manager) or whether these are specializations of existing occupations.

⁸ OECD 2012

Operators of small hospitality establishments

33. There is a possible need for the separate identification of operators of small bars, cafés and restaurants, who are currently classified as waiters, bartenders, cooks or chefs, depending on the main tasks or duties performed. A separate unit group could be created in Minor group 513, Bartenders and Waiters. Operators of small hotels, bed and breakfast establishments and guest houses are currently classified in Unit group 5152, Domestic Housekeepers. It may be more appropriate to identify them as a separate unit group within the same minor group. Alternatively, the two new unit groups envisaged could be moved to form a new unit group for Operators of small hospitality establishments.

Subsistence Farmers, Fishers, Hunters and Gatherers

34. Sub-major group 63, Subsistence Farmers, Fishers, Hunters and Gatherers was created in the absence of any other international statistical instrument to allow measurement of subsistence activity. The draft resolution concerning work statistics, to be considered by the 19th ICLS proposes to restrict the concept of employment to any activity to produce goods or provide services for pay or profit, and introducing two separate forms of work, namely own-use production work and volunteer work, so as to fully capture all work activities.
35. If this proposal is adopted, the recognition of production of goods for own consumption as a separate form of work would call into question the need for ongoing identification of subsistence farmers, fishers, hunters and gatherers as a sub-major group in ISCO-08. A possible option would involve deleting Sub-major Group 63 and removing the restriction to market-oriented production of the remaining sub-major groups in Major Groups 6, Skilled Agricultural, Forestry and Fishery Workers. The impact would be small for most countries as this group is not always used in national adaptations of ISCO.

Home improvements installers

36. Jobs that involve installation of things like blinds, curtains, awnings, prefabricated doors and windows currently have to be included either (1) with the closest trade occupation (for example door installers could be included in Unit Group 7115, Carpenters and Joiners), (2) in the residual Unit group 7119, Building Frame and Related Trades Workers Not Elsewhere Classified, or (3) in Unit Group 9313, Construction labourers. None of these options is satisfactory. Grouping of these jobs with specific trades is misleading as they do not perform the full range of tasks, although generally falling within the very broad Skill Level 2. Inclusion of these jobs in Unit Group 7119 is problematical as these workers are not concerned with building frames. Including them in Unit Group 9313 does not appropriately reflect their skill level.
37. Within the current skill level framework the problem could be resolved by the creation of either a specific unit group or a residual category in Minor group 712, Building Finishers and Related Trades Workers. A global resolution of the problem with the breadth of Skill Level 2, as discussed above, would offer more satisfactory options.

Vehicle accessory fitters

38. Occupations such as tyre fitter that do not require full trade qualifications have to be classified in Unit group 7231 Motor Vehicle Mechanics and Repairers. This is a similar problem to the one described above for home improvements installers. It could be resolved by the creation of a

separate unit group in Minor group 723, Machinery Mechanics and Repairers. Some national classifications already provide a category for this group. For example, the United Kingdom Standard Occupational Classification has a category entitled 'Tyre, exhaust and windscreen fitters'

Trades Assistants

39. Unskilled assistants to printers, mechanics, telecommunications technicians and electrical tradespersons are not adequately identified. They are currently likely to be included either in Unit group 9329, Manufacturing Labourers Not Elsewhere Classified, or in Unit group 9629, Elementary Workers Not Elsewhere Classified. Depending on national practices, some of these occupations may currently be classified with the relevant trade or craft in Major group 7, however. The problem could be addressed by expanding the scope of Minor Group 932 Manufacturing Labourers and adding one or more new unit groups to that minor group. It would be important, however, to clearly distinguish between apprentices, who may frequently perform similar tasks to trades assistants, and those not undertaking the work as part of a training programme.

Armed forces

40. The scope of the Major Group 0, Armed Forces Occupations, was discussed during the development of ISCO-08 and remains problematical. There is a range of national practices with respect to the classification of occupations that are specific to the military and jobs in the armed forces that are similar to civilian jobs. In many countries, it is not possible to collect information on the nature of the work performed by members of the armed forces and all have to be classified together. In view of the significant variations in national practice there would be a need to re-open the discussion on the treatment of jobs in the armed forces in the context of a review of ISCO-08. For example, should Major Group 0 only include core military staff who perform typically military tasks, or also other jobs undertaken by members of the armed forces such as medical doctors, kitchen staff, truck drivers, human resource officers, operators of electronic military equipment; or should those occupations have equivalents in civil life be classified together with the civilian equivalent, outside Major Group 0?

3. Conclusions and next steps

41. The experts who provided comments to the ILO expressed a range of views about the nature of any short or longer term work to update or review ISCO-08. Some felt that a short term update to address some or all of the cases where there was a need to provide more detailed categories should proceed as a priority. Many were concerned, however, that many countries were still in the process of implementing ISCO-08 in their national statistics, and that there was a need for a more thorough evaluation of the classification before any changes were made. There were concerns about the costs of a minor update and about the impact on international comparability of data for the same reference period, since it was unlikely that countries would all implement the updated version at the same time.
42. Based on the information available and opinions expressed it seems that two options could be contemplated.
 - i. A minor update could be undertaken and completed in a period of one to two years. Changes would be restricted to the addition or deletion of categories at the unit group level, or the movement of some occupations from one unit group to another. This would require mandate from the 19th ICLS for the updated classification (effectively ISCO-08 version 2) to be adopted by a tripartite meeting of experts in 2015. The need for a full review could then be considered by the 20th ICLS.
 - ii. A wider review conducted over a longer timeframe, and allowing more significant structural changes to be considered, could be completed after the 20th ICLS. Work to evaluate ISCO-08 and further develop proposals for revision could continue in preparation for the 20th ICLS with a view to presenting one or more options for conclusion of the work.

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