Occupational injuries statistics from household surveys and establishment surveys

AN ILO MANUAL ON METHODS

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Foreword

This manual has been prepared by the ILO Bureau of Statistics as follow-up to the Resolution concerning statistics on occupational injuries (resulting from occupational accidents), adopted by the 16th International Conference of Labour Statisticians (ICLS) in 1998. It is the fruit of close collaboration with the then ILO InFocus Programme on Safety and Health at Work and the Environment (SAFEWORK), aimed at developing new methodologies to fill the gap in the existing systems for the compilation of statistics in this field. Through their participation in the pilot testing of the new methodologies, the national statistical offices of Jamaica, Nigeria and the Philippines played an essential role in forwarding knowledge and experience in the collection of data on occupational injuries through household surveys and establishment surveys. The Bureau of Statistics takes this opportunity to thank those offices for their collaboration in this important effort.

The manual provides valuable advice to those involved in the production of statistics on occupational injuries, using sources other than the traditional notification systems. Its extensive chapters on concepts and definitions, as well as types of data and classifications, will serve as a reference to both producers and users of these statistics. While aimed at the collection of data through household surveys and establishment surveys, the manual will also be useful to those responsible for the systems for the notification of occupational injuries. It may serve to improve some of the elements of the data compiled through these systems. The training materials at the end will also be useful for training labour statisticians and users of the statistics.

A. Sylvester Young
Director
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Contents

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This manual was written by Karen Taswell, Senior Statistician, ILO Bureau of Statistics, and Peter Wingfield-Digby, Statistical Consultant. It builds on the work carried out within the framework of the ILO project to develop new methodologies for statistics on occupational injuries, and has benefited considerably from the experience gained in testing the draft new methodologies in collaboration with the Statistical Institute of Jamaica, the Federal Office of Statistics of Nigeria and the National Statistics Office of the Philippines. Particular inputs were provided by Hubert Sherrard, George Adewoye and Rose Venzuela Ignacio respectively of these organizations. A. Sylvester Young, Director of the ILO Bureau of Statistics, and Robert Pember, Senior Statistician, ILO Bureau of Statistics, also furnished useful comments and suggestions.

The ILO Bureau of Statistics wishes to thank all those who participated in the Technical Working Group (ILO, Geneva, August 2003) where the new methodologies were further discussed. George Adewoye and Rose Venzuela Ignacio also attended, along with representatives from the World Health Organization, the Statistical Office of the European Union and a number of ILO units (InFocus Programme for Safety and Health at Work and the Environment, Bureau of Statistics, Conditions of Work and Employment Department, InFocus Programme on Socio-Economic Security, Employment Trends Unit, Social Security Department and the International Occupational Safety and Health Information Centre (CIS).

Acronyms

ESAW	European Statistics on Accidents at Work
ICLS	International Conference of Labour Statisticians
ICSE	International Classification of Status in Employment
ILO	International Labour Organization
IPEC	International Programme on the Elimination of Child Labour
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industrial Classification of All Economic Activities
LABORSTA	ILO's statistical web site
LFS	Labour Force Survey
OSH	Occupational Safety and Health
PPS	Probability proportional to size
PSU	Primary sampling unit
SIMPOC	Statistical Information and Monitoring Programme on Child Labour
SNA	System of national accounts
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Introduction 1

Decent work must be safe work

Since its foundation in 1919, improving occupational safety and health has been at the heart of the work of the International Labour Organization (ILO), and it continues to be a fundamental requirement for achieving the objectives of the ILO's Decent Work Agenda. Over the years, the ILO has adopted an extensive series of international standards and instruments on occupational safety and health, and these have helped to improve working conditions considerably. Despite this, occupational accidents and occupational diseases continue to exact a high toll on working populations around the world. Recent ILO estimates[1] indicate that each year more than 350,000 workers throughout the world die as a result of occupational accidents and at least 260 million sustain injuries serious enough to prevent them working for more than three days.

The need for data

Statistics of occupational injuries are essential for accident prevention. At its 91st Session in 2003, the International Labour Conference adopted a global strategy on occupational safety and health,[2] which recognizes the importance of targets and indicators in national occupational safety and health programmes to provide "a tool for the evaluation of progress by constituents, as well as a basis for periodic review and identification of future priorities for action in the prevention of occupational accidents and diseases" (paragraph 12). It also states that "adequate capacities to develop, process and disseminate knowledge – be it international standards, ... accident and disease statistics, ... – are a prerequisite for identifying key priorities, developing coherent and relevant strategies, and implementing national OSH programmes" (paragraph 15).

[1] See ILO: *Introductory Report: Decent Work - Safe work, XVIIth World Congress on Safety and Health at Work* (Geneva, 2005) and http://www.ilo.org/public/english/protection/safework/wdcongr17/intrep.pdf.

[2] See ILO: *Global Strategy on Occupational Safety and Health,* Conclusions adopted by the International Labour Conference at its 91st Session, 2003 (Geneva, 2003), and http://www.ilo.org/public/english/protection/safework/globstrat_e.pdf.

Data on the distribution of persons injured and their injuries, as well as occupational accidents, are essential for planning preventive measures. Workers in occupations and activities of highest risk can be targeted more effectively for safety campaigns, inspection visits, and the development of safety equipment, procedures and regulations. With data classified by sex and age, and other characteristics, high-risk groups in different segments of the working population can be identified and targeted. When measured over a period of time, the data can reveal progress or deterioration in occupational safety, and thus the effectiveness of prevention measures.

Statistics on occupational injuries can be used for a wide variety of purposes, as recognized in 1998 by the 16th International Conference of Labour Statisticians (ICLS) in its resolution concerning statistics on occupational injuries (resulting from occupational accidents).[3] It is obvious that comprehensive, good quality data are a requisite for each of these purposes. There are many different audiences for information about occupational accidents: for instance, employers, workers, occupational safety and health professionals, insurance institutions, governments, international organizations, those involved in emergency response and the media. There are also various types of statistical measures of occupational accidents and occupational injuries that are needed for the different uses and by different users.

Purpose of the manual

Statistics on occupational injuries are lacking in about one-third of countries around the world. Even where they are available, they are often incomplete and subject to a number of limitations. The principal data sources in most countries are the administrative records of compensation schemes and the systems for notifying occupational injuries to labour inspectorates, health and safety organizations and other relevant authorities. These reflect the requirements of national labour legislation, and many have restricted coverage in terms of workers, activities or types of injuries. Typically, they cover paid employees engaged in some or all private sector activities. The coverage of the self-employed is usually far from complete, and some activities, such as public administration, agriculture or those in the informal sector, are often excluded completely. Even where notification of occupational injuries is compulsory according to laws or regulations, there is widespread under-reporting to the relevant authorities for a number of reasons. These sources also tend to apply different criteria to the cases of injury that are to be reported or compensated; for example, in terms of a minimum number of days of absence from work or in terms of the maximum period following an occupational accident during which a fatality is considered as a work-related fatality. As a result, many cases of occupational injury fall outside the scope of current national statistical systems.

[3] See Annex 1 for the full text of the 16th ICLS resolution.

Household surveys and establishment surveys can provide national labour statisticians with alternative or complementary sources for collecting statistics on occupational injuries. They can help by generating information that can be used to shed light on the completeness of existing notification and compensation systems and reveal the extent to which they underestimate the actual levels of occupational injuries.

The main purpose of this manual is therefore to provide guidance to national labour statisticians engaged in or proposing to start the compilation of statistics of occupational injuries through household surveys or establishment surveys. The methods proposed here should not be seen as replacing or duplicating the existing methods of collecting data on occupational injuries. The ILO Protocol of 2002 to the Occupational Safety and Health Convention 1981 (P. 155),[4] recommends notification systems as the major source of statistics in this field. However, it will be some time before all national notification systems have achieved the coverage and efficiency required to produce comprehensive statistics on this important topic. Until then, survey methods can help to fill the information gaps, as well as providing a valuable tool for assessing the efficiency of notification systems. They also provide the possibility of obtaining information on the characteristics of injured persons that are not usually available through notification systems. The methods suggested here may be of help to countries that are contemplating introducing data collection systems on occupational injuries for the first time.

While the main purpose of the manual is to assist labour statisticians in producing statistics on occupational injuries to meet their own countries' needs, in accordance with their own countries' circumstances, a secondary aim is to improve the comparability of these data between countries, by promoting the application of the internationally recognized standards in this field. It is evident that the methodologies described in this manual, which are based particularly on the recommendations contained in the 16th ICLS resolution, may need to be adapted to the special conditions prevailing in some countries, or to meet their particular requirements regarding statistics on occupational injuries. Nonetheless, by basing their methodologies on these guidelines, countries will be in a better position to produce statistics that are more comparable with those of other countries.

[4] See http://www.ilo.org/public/english/standards/relm/ilc/ilc90/pdf/protocol.pdf for the text.

Scope and content of the manual

This manual gives practical guidance for the production of statistics on occupational injuries through household surveys and establishment surveys, based on the provisions of the 16th ICLS resolution, which specifically recommended that the ILO's future action in this area include the preparation of a manual to provide technical guidance on the contents of the resolution. The methodologies which are the subject of the manual draw on the experience gained through an ILO project carried out jointly by the InFocus Programme for Safety and Health at Work and the Environment and the Bureau of Statistics during 1999–2003 to develop and test new tools for collecting basic statistics on occupational injuries from various sources other than official notification systems. The aim was to help ILO constituents obtain, at relatively low cost, the reliable and comprehensive information needed to make estimates of the number and distribution of occupational injuries by economic activity, occupation and sex, and the corresponding incidence rates. This project and other new developments in this field are described in chapter 2, along with information about other international guidelines relevant to statistics of occupational injuries.

The manual consists of 11 chapters. Following the introduction in chapter 1 and the international guidelines and new developments described in chapter 2, chapter 3 covers the concepts and definitions for use in conjunction with statistics on occupational injuries. It also sets out a framework for occupational injuries which situates the worker within the working environment, and then indicates the various stages and relevant elements which lead up to the accident and injury, and the consequences of the injury. Chapter 4 discusses the scope and coverage of occupational injury statistics. Chapter 5 deals with different types of data and variables relevant to occupational injury statistics, discussing measurement issues and classification schemes, while the choice and calculation of four main indicators is the subject of chapter 6. Chapter 7 gives guidance on choosing the appropriate survey for collecting the data, and chapters 8 and 9 provide practical advice for collecting data through household surveys and establishment surveys respectively. Finally, chapter 10 covers data processing and analysis and chapter 11 the presentation and dissemination of the results.

An extensive series of annexes provide the international standards relevant to statistics of occupational injuries, training materials for data collection and classification schemes.

International statistics

As previously mentioned, many countries compile and publish statistics on occupational injuries. In general, the information is extracted from the administrative reports of occupational injuries submitted to agencies responsible for compensation, labour inspection or occupational safety and health. Since 1940, the ILO has published official national statistics on occupational injuries in its *Yearbook of Labour Statistics,*[5] and since 1985, all series have been available on the ILO's statistical web site, LABORSTA,[6] which is updated each month. Around 110 countries regularly provide the ILO with their data each year, and information about the methods used to compile these statistics accompany the series.[7] These descriptions, along with the synoptic table appearing in the *Yearbook*, volume 1 and in LABORSTA, are important tools for enabling users to understand the data and make appropriate use of them. This is important information for users, as many of the data sources have limitations, particularly in relation to coverage and under-reporting.

The types of data appearing in the *Yearbook* and in LABORSTA are guided by the recommendations of the 16th ICLS resolution, namely, cases of injury (fatal and non-fatal with lost workdays, and cases of temporary incapacity), rates of injury (fatal and non-fatal), and days lost by cases of temporary incapacity. Where possible, the series are classified by branch of economic activity.[8] Explanatory notes accompanying the data caution the reader to take care when using these data, particularly when making international comparisons. They point out that the sources, reporting procedures and coverage of the data differ between countries. For example, coverage may be limited to certain types of workers (employees, insured persons, full-time workers, etc.), certain branches of economic activity, establishments employing more than a certain number of workers, or injuries giving rise to more than a certain number of days of absence from work.

The explanatory notes also mention the fact that the number of persons exposed to the risk of occupational injury varies between countries and economic activities and from one period to another, because of differences or changes in the size and composition of employment. To some extent, these aspects are taken into account by using relative measures, such as incidence or frequency rates, in which the number of persons injured is related to the total number of persons exposed to the risk or the total hours worked by them. A rise or fall in the number of occupational injuries over a period of time may reflect not only changes in conditions of work and the work environment, but also modifications in reporting procedures or coverage, or revisions to laws or regulations governing the reporting or compensation of occupational injuries in the country concerned.

[5] *Yearbook of Labour Statistics* (ILO, Geneva, annual).
[6] See http://laborsta.ilo.org.
[7] These appear in ILO: *Sources and methods: Labour statistics,* volumes 8 (occupational injuries) and 9 (transition countries), as well as on the LABORSTA web site.
[8] According to the International Standard Industrial Classification of All Economic Activities, revisions 2 and 3. At the time of writing, the structure of Revision 4 was available. See http://unstats.un.org/unsd/.

International guidelines 2

Over the past 80 years or so, the ILO has been particularly active in both setting and promoting standards for occupational safety and health, covering all aspects of this important area including statistics. These standards take the form of international labour Conventions and Recommendations, codes of practice and statistical resolutions.

ILO Conventions and Recommendations

There are many ILO Conventions and Recommendations, as well as codes of practice, covering major hazardous sectors and key hazards.[2] The most important Conventions for statistical purposes are the Labour Inspection Convention, 1947 (No. 81), the Occupational Safety and Health Convention, 1981 (No. 155), the Protocol of 2002 to the Occupational Safety and Health Convention, 1981 (P. 155) (which sets out the requirements and procedures for the recording and notification of occupational accidents and occupational diseases), the Labour Statistics Convention, 1985 (No. 160) and the Occupational Health Services Convention, 1985 (No. 161). These Conventions are supplemented by various Recommendations that provide additional guidance for applying their provisions.

Convention No. 160 provides for a basic set of labour topics on which countries should aim to collect, compile and publish statistics, including occupational injuries and occupational diseases.[2] The Labour Statistics Recommendation, 1985 (No. 170) supplements this Convention with guidance on periodicity and classification.

ILO Conventions are comparable to multilateral international treaties: they are open to ratification by member States and, once ratified, create specific, binding obligations. A State that has ratified a Convention is expected to apply its provisions by legislation or by other appropriate means as indicated in the text of the Convention. The Government is required to report regularly on the application of ratified Conventions, and the extent of compliance is subject to examination and public comment by ILO machinery. ILO Recommendations

[1] The full list is provided in annex 2, and can be found at http://www.ilo.org/safework.
[2] For the full texts of the Labour Statistics Convention, 1985 (No. 160) and Recommendation, 1985 (No. 170) see http://www.ilo.org/stat. Extracts relevant to statistics on occupational injuries are reproduced in annex 3.

are intended to offer guidelines for action by member States. Often, a particular Recommendation will elaborate upon the provisions of a Convention on the same subject, but no specific substantive obligations are entailed.

Although this section focuses on the ILO's role in measuring occupational injuries, it is appropriate to acknowledge the important roles played by other international organizations. For instance, the World Health Organization (WHO) which has a programme specifically designed to address the issue of occupational injuries and disease. A joint ILO/WHO Committee on Occupational Health, which has met regularly since 1950, makes recommendations on inter-agency collaboration, and sets out priorities for action in the field of occupational health. It also initiated joint work on the *Global Burden of Disease* statistics.[3]

The United Nations Children's Fund (UNICEF) also has a concern for occupational injuries, in so far as working children are affected by injuries. According to its estimates and definitions, almost 250 million children are engaged in child labour, with three-quarters of these children working in hazardous conditions, such as in mines or with chemicals and pesticides in agriculture or with dangerous machinery.[4]

The ILO itself has recently had a substantial programme in the area of child labour, through its International Programme on the Elimination of Child Labour (IPEC). In particular, its Statistical Information and Monitoring Programme on Child Labour (SIMPOC) has been assisting countries in generating comprehensive data on child labour. So far, surveys on this topic have been carried out in around 30 countries. The very detailed questionnaires used in these surveys include some questions about injuries sustained while working, the nature of the injury, what work was being done at the time of the accident and the severity of the accident.[5]

[3] See http://www.who.int/topics/global_burden_of_disease/en/.
[4] See http://www.unicef.org/protection/files/Child_Labour.pdf.
[5] See http://www.ilo.org/ipec/index.htm.

Statistical resolutions

Since 1923, statistics on occupational injuries have been the subject of discussion and the development of standards in the form of resolutions adopted by various International Conferences of Labour Statisticians (ICLS). The latest is the resolution concerning statistics on occupational injuries (resulting from occupational accidents), adopted by the 16th ICLS in 1998. The guidelines in this resolution are consistent with the standards contained in the above-mentioned ILO Conventions, Recommendations and codes of practice, but give more detailed advice for statistical purposes. The resolution contains guidance on the general objectives and uses of the statistics, terms and definitions, coverage of the statistics, types of data to be collected, measurement, reference period and periodicity, constructing comparative measures, dissemination of data, sources of data and classifications. It also includes recommendations for future action by the ILO, including the preparation of a manual to provide technical guidance on the contents of the resolution. One important aspect of the resolution is that it does not advocate the use of one particular type of data source, but rather that the statistics should be based on a range of sources of information, including surveys of households and of establishments.

This resolution will be referred to frequently in this manual, providing as it does the basic principles on which the measurement guidelines are founded.

ILO project

Based on the 16th ICLS recommendations, the ILO initiated a project in 1999 to establish new methodologies for data collection. The first stage of the project comprised the development of three sets of draft instruments for testing:

- A special module of questions to be attached to regular household surveys of the labour force, with detailed instructions for enumerators, guidelines for producing the relevant estimates and a tabulation plan;

- A special module of questions to be attached to regular surveys of establishments, with detailed instructions for respondents, guidelines for producing the relevant estimates and a tabulation plan; and

- A special form for the collection of information from other sources, such as records kept by organizations of employers and of workers, with detailed instructions for respondents.

All these instruments used the same concepts, definitions and classifications, in order to facilitate as far as possible the integration of data from different sources.

The draft methodologies were field tested during 1999–2000 in three countries: Jamaica, Nigeria and the Philippines, where the national statistical offices were responsible for data collection, processing and analysis, using resources and technical support provided by the ILO. In 2003, a three-day technical working group convened by the ILO examined the outcome of the pilot surveys and made recommendations for finalizing the new methodologies. It concluded that, while surveys of households and of establishments could provide useful data on occupational injuries, sources such as the records of occupational injuries kept by organizations of employers and of workers did not appear suitable for the purposes of establishing comprehensive statistics. In fact, it had not been possible to compile statistics from such sources in any of the countries taking part in the field test. Consequently, this manual concentrates on surveys of households and of establishments as sources of statistics.

Lessons learned from the ILO project

As may be expected, a number of important lessons were learned during the field tests of the new methodologies. These are presented in summary form here, but are expanded upon later when the specific methodologies of household and establishment surveys are discussed.

- **Know what you are trying to measure:** As with any technical subject, there is a need to master the basic conceptual ideas involved in measuring occupational injuries, before trying to design a suitable survey instrument to collect the required information.

- **Keep the survey instrument as simple as possible:** Do not try to collect every conceivable piece of information that might be useful, but concentrate on the essentials, and do not try to combine with data collection on a range of unrelated topics. Overburdening respondents and enumerators could lead to poor quality results.

- **Be wary of collecting data on fatal occupational injuries through sample survey:** Occupational fatalities are relatively rare occurrences, and it is very difficult to collect reliable data about them through sample surveys of households or of establishments.

- **Give good training to all staff, including the field staff:** Devote sufficient resources (time, money and staff) to the training of staff, since the quality of the training has a direct bearing on the quality of the resulting data obtained from the survey.

- **Maintain close collaboration between the statistics office, the labour ministry and other government agencies responsible for occupational safety and health, as well as organizations representing employers and workers:** These parties, who are the principal users of the statistics, need to have a sense of "ownership" of the survey process so that the survey generates data that are actually useful for policy purposes, and are actually used for those purposes.

- **Ensure adequate financial resources are available to complete the survey and obtain results:** Financial support from donors may be required in some cases to establish the survey. If resources are limited, consider using the "piggy-back" approach, where a small module dealing with occupational injuries rides on the back of another survey.

- **Seek outside technical assistance if needed:** It is likely that many developing countries will require some technical inputs in the planning and analysis stages of their first surveys on occupational injuries, especially if their survey capacity is not very strong.

Concepts and definitions 3

Users of statistics of occupational injuries want to know not just who has been injured. They also want to know how and why the accidents happened, how the people came to be injured and what the consequences of the injuries were. To understand this, it is useful to use a framework which situates the person injured within his or her working environment, and then indicates the different stages and relevant elements that lead up to the accident and injury, and, finally, the consequences of the injury. This chapter outlines the framework and then discusses the relevant concepts and definitions.

A framework for statistics on occupational injuries

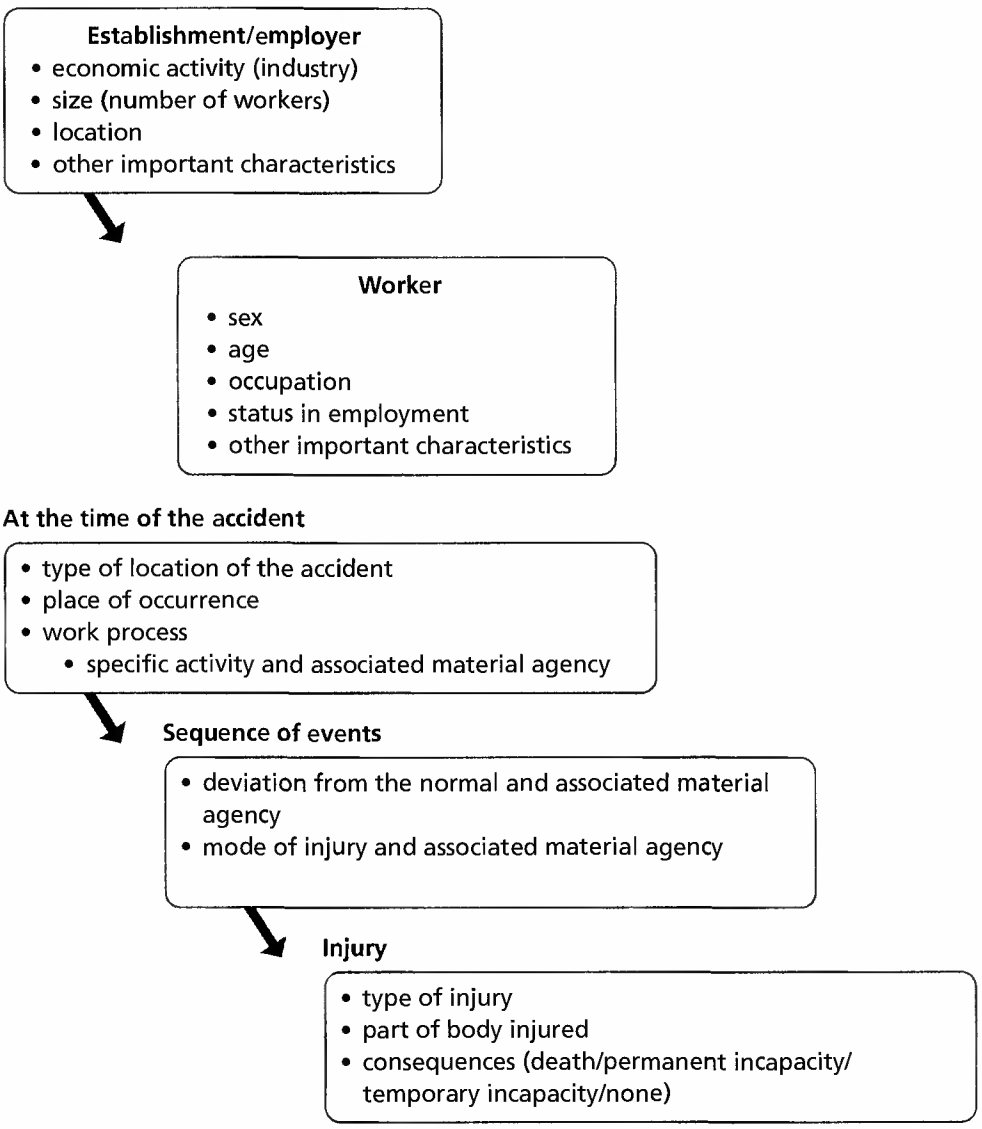
The framework described below and shown in figure 3.1 is intended to assist in understanding how an accident happens and the different aspects and dynamics involved, so that these can be better understood and measured for statistical purposes. It is not the intention here to provide guidance on attributing blame for an accident. Accidents are the outcome of a set of circumstances, and it is extremely difficult to identify a single cause. Many factors may contribute towards setting the conditions for an accident to occur, including the worker's own characteristics and family situation, home environment, events during the journey to work, types of equipment and materials used, and so on. For example, tiredness, stress, poor working conditions (noisy, dirty, poor lighting, etc.), lack of safety equipment, inadequate training in the use of equipment, inattention, time of day and many other factors may play a role in an accident. Since the principal purpose of compiling the statistics is for the purposes of preventing occupational accidents and injuries, the framework is restricted to the worker in the working environment, i.e. areas that can be changed or influenced by the employer or the worker herself or himself, in the case of someone working for herself or himself, or by the health and safety authorities. Certain other factors outside the working environment may be important, such as long and tiring journeys to and from work or difficult family situations, but these usually fall outside the control of the employer or the health and safety authorities, and it is not possible to identify and quantify them all. Much more detailed information is in fact collected during investigations of fatal and other serious accidents, but these fall outside the scope of this manual.

The starting point for the framework is the worker, the environment in which he or she is working and the type of work carried out. This provides the background to the accident. The worker has a set of personal characteristics, including sex, age, education, training, work experience and language(s) spoken. He or she carries out a particular set of tasks with certain responsibilities that can be subsumed under an occupation, with a particular employment status (paid employee, own-account worker, unpaid family worker, etc.), for a particular employer or for himself or herself (for an establishment of a certain type and size, engaged in a particular economic activity) and within a particular working environment where the accident happens (the workplace, work premises or general environment).

Before the accident happens, the person is carrying out a "work process"; this means the main type of work done. This is not the occupation, but the general type of work and the task performed during the period leading up to the accident. When the accident occurs, the worker is carrying out a "specific activity", i.e. what the person is actually doing at the time of the accident, perhaps using a tool or piece of equipment or material, "the material agency" associated with the specific activity, at a particular "location". Up to this point, information of this type can be used to describe any worker, whether or not they are subsequently involved in an accident.

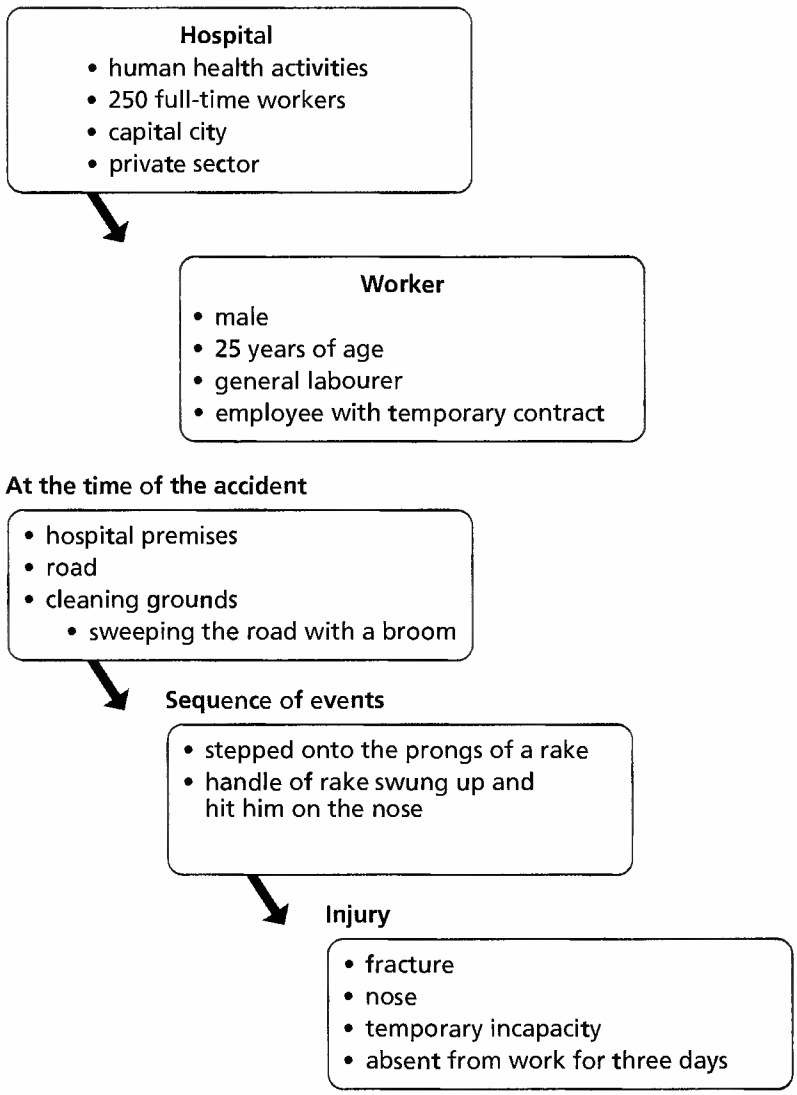
At some point, though, something goes wrong, and an abnormal, unexpected and undesired event or perhaps a chain of incidents occurs, a "deviation from the normal", which causes the accident. In many cases, this involves an item or an object. As a result, the person is injured in a certain way, incurring a "type of injury" to a "part of their body", by an item or object, the "material agency associated with the injury". This injury may kill the person, or cause them to stop working in order to receive first aid treatment at the workplace or medical treatment, for example at a hospital. Subsequently, if the injured worker cannot return to work immediately, there is a period of "incapacity" or a period during which the worker has "restricted activity". This may be temporary, and, following a period of "absence from work" or "restricted activity", time may need to be allowed for recovery, convalescence and, if necessary, rehabilitation. If the injury is such that the worker sustains permanent incapacity (such as the loss or use of a limb or eyesight), they may not be able to work again or carry out the same job in which they were employed at the time of the accident. The accident could also lead to the development of a disease at a later date, particularly in the case of accidental exposure, for example to radiation or a virus.

Figure 3.1
Framework for occupational injury statistics



The following example illustrates this framework (see figure 3.2). A young man, 25 years of age, was engaged as a general labourer on a short-term contract by a hospital that employed around 250 full-time workers, and was located in an industrial area on the outskirts of the capital city. His duties included cleaning floors and windows, moving beds and other general tasks such as keeping the hospital grounds clean and tidy. On the day of the accident, the young man was engaged in clearing leaves from the grass and road in front of the hospital. He began by raking leaves from the grass and when he had finished, leaned the rake against the wall. Then he picked up his broom to sweep the leaves from the road leading to the hospital entrance. At one point, he stepped back from the road onto the grass, not noticing that the rake he had been using earlier had fallen over and was lying with its prongs facing upwards. He stepped on the prongs of the rake, but fortunately they did not pierce his foot as he was wearing boots. However, the handle of the rake swung up rapidly and hit him hard on the nose, breaking it. He went to the emergency unit of the hospital where he was treated and sent home to rest for three days before returning to work. A week later, while back at work, he went to the unit to have the dressing removed and only missed an hour of work.

Figure 3.2
Example using the framework for occupational injury statistics



Finally, by way of light relief, Box 3.1 is based on Gerald Hoffnung's address to the Oxford Union in 1958. This humorous account illustrates, in a rather over the top way, some of the complexities of reporting on occupational accidents.

Box 3.1 "I met a barrel"

Dear Sir,

I am writing in response to your request for additional information in Block 3 of the accident report form. I put "Poor planning" as the cause of my accident. You asked for a fuller explanation and I trust the following details will be sufficient.

I am a bricklayer by trade. On the day of the accident, I was working alone on the roof of a new six-storey building. When I completed my work, I found I had some bricks left over, which, when weighed later, were found to be slightly in excess of 500 lb. (225 kg.) Rather than carry the bricks down by hand, I decided to lower them in a barrel by using a pulley, which was attached to the side of the building on the sixth floor. Securing the rope at ground level, I went up to the roof, swung the barrel out and loaded the bricks into it. Then I went down and untied the rope, holding tightly to ensure a slow descent of the bricks.

You will note in Block 11 of the accident report form that I weighed 135 lb. (62 kg.) Due to my surprise at being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rapid rate up the side of the building. In the vicinity of the third floor, I met a barrel which was now proceeding downward at an equally impressive speed. This explains the fractured skull, minor abrasions and the broken collarbone, as listed in Section 3 of the accident report form.

Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley. Fortunately, by this time I had regained my presence of mind and was able to hold tightly to the rope, in spite of the excruciating pain I was now beginning to experience.

At approximately the same time, however, the barrel of bricks hit the ground and the bottom fell out of the barrel. Now devoid of the weight of the bricks, that barrel weighed approximately 50 lb. (22 kg.) I refer you again to my weight. As you might imagine, I began a rapid descent, down the side of the building. In the vicinity of the third floor, I met the barrel coming up. This accounts for the two fractured ankles, broken tooth and severe lacerations of my legs and lower body. Here my luck began to change slightly.

The encounter with the barrel seemed to slow me enough to lessen my injuries when I fell into the pile of bricks and fortunately only three vertebrae were cracked. I am sorry to report, however, as I lay on the pile of bricks in pain, unable to move, I lost my composure and presence of mind and let go of the rope and I lay there watching the empty barrel begin its journey back down to me. This explains the two broken legs.

I hope this answers your inquiry.
Yours, etc.

Definition of key terms

The framework and example described in figures 3.1 and 3.2 use a number of terms with specific meanings. It is essential for both producers and users of any statistics to have a clear and common understanding of what is meant by the concepts being used to measure and analyse a particular phenomenon. This section discusses the principal concepts used in the manual and their definitions. Unless otherwise indicated, they are taken from the 16th ICLS resolution. They are consistent with the definitions included elsewhere in ILO Conventions and Recommendations, but have been developed specifically for statistical purposes.

Occupational accident: an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death. Occupational accidents include travel, transport or road traffic accidents in which workers are injured and which arise out of or in the course of work, i.e. while engaged in an economic activity (industry) or at work or carrying on the business of the employer.

Occupational accidents cover all accidents causing injury, death or disease occurring at the workplace or elsewhere, while the worker is carrying out the business of the employer (who in the case of an own-account worker is the same person). Something goes wrong – a "deviant" event occurs – often involving an associated item, object or material. This might be, for example, an explosion, a fall, loss of control of a machine or a slip. It is this deviant event which is of interest to safety specialists, as this could be prevented, at least in theory. The item that is associated with the event is also significant, as it helps to understand how the accident happened and how it could be prevented.

An occupational accident may result in one person or several persons being injured. It is important to have information about each person injured as a result of each accident, and how each person came to be injured. Again, this is useful for understanding how each injury could be prevented.

When a worker is injured in a factory, workshop, shop, storage area, office, construction site or some other fixed workplace, it is fairly easy to understand that it results from an occupational accident. This may not be the case when a worker is injured away from the employer's premises, at a location that is not normally considered as a workplace, or is outside the normal workplace. For example, a driver injured in a road traffic accident, a travelling salesperson injured while demonstrating goods to a potential buyer or a worker injured in a fall during a business meeting in another city. In fact, the criterion for deciding whether an occupational accident has occurred is not the place where the accident occurred, but whether the accident happened *in connection with work or*

arising out of work. If a worker is injured while carrying on the employer's or his or her own business, wherever that may be, it is considered to be an occupational accident.

The 16th ICLS decided that occupational accidents should encompass acts of violence, where these occur in connection with or arising out of work. Consequently, aggression by a co-worker or by a member of the public while a worker is engaged in his or her work is an occupational accident (for example, attacks on hospital personnel by patients and armed robberies in shops).

Occupational injury: any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity.

The consequences of an occupational accident may therefore be:

a) *fatal injury* – the most extreme outcome; the victim may die immediately, or at some time after the accident; or

b) *non-fatal injury* – which may be incapacitating, so that the worker is not able to carry on working, either temporarily or permanently, or is unable to carry out all the normal tasks associated with the job at the time of the accident, or may only require first aid or minor treatment, after which work can be resumed as normal.

An occupational injury may be any kind of wound, and can range from a minor injury, such as a bruise, scrape or cut, to more severe injuries such as shock, concussion, loss of a limb or an eye, fractured bones, suffocation, poisoning or an illness such as cancer resulting from a single accidental exposure to radiation.

Temporary incapacity means that the injured worker eventually recovers to the extent that he or she can return to work and take up all the tasks carried out before the accident. The worker may stop working in order to receive first aid or medical treatment and then be able to resume work on the same day as the accident; there may also be subsequent treatment not requiring the worker to miss any days of work. If the injury is more severe, the worker may be unable to work after the day of the accident and be absent from work for some time. When sufficiently recovered, he or she returns to work, and is able to carry out the same tasks as before the accident. The absence from work may be for just one day, several days, a week, a month or a longer period.

An occupational injury may also result in *restricted activity*, whereby the victim does not stop working, but is temporarily unable to perform the normal tasks of the job. This concept is particularly relevant for workers who are not covered by

accident insurance and who therefore do not receive any compensation or replacement for loss of earnings. In order to continue to receive some income, if at all possible they continue working, albeit with limitations as to the work they can carry out. It is also relevant for self-employed workers such as own-account workers and employers, whether or not they are covered by accident insurance, as their enterprises may depend on their participation.

Permanent incapacity means that the injured worker does not recover fully. The injury may result in a disability, so that even if the worker is able to return to work, he or she is not able to carry out the same tasks as before the accident.

It should be noted that diseases are only included within the scope of occupational accidents, and thus counted as occupational injuries, in cases where the disease arose as a direct result of a particular accident. Examples of these are a disease caused by a single accidental exposure to radiation in the workplace, or a single exposure to a virus in the workplace. Occupational diseases, which are contracted as a result of exposure over a period of time to risk factors arising from work activity, are not counted as occupational injuries.

The question arises as to why this distinction is made. There are several reasons, some historical, some conceptual, some practical and some due to the objectives of compiling the data. Occupational injuries are relatively simple to identify as resulting from occupational accidents, but occupational diseases may be more difficult to identify. An occupational disease may not be diagnosed or determined as such until many years after the exposure to risk factors has ceased. Much depends on whether and how occupational diseases are dealt with by health services and health insurance and compensation schemes. In many countries, the only illnesses officially recognized as occupational diseases are those included in a list established for compensation purposes. It may be difficult for medical practitioners to decide whether a disease is occupational in origin, and they may receive little or no training in this. There may not even be an official definition of an occupational disease. Another difference stems from the way they are dealt with for prevention purposes. An occupational injury results from an identifiable occupational accident, for which preventative measures can be relatively easily planned and monitored. The prevention of an occupational disease tends to take a longer, more complex route, which depends on the disease being identified as occupational in origin and due to specific risk factors. It is worth noting that at the time of writing, statistics that are currently compiled on occupational diseases usually cover only the diseases indicated in the schedule of diseases set up for compensation purposes.

Injuries due to commuting accidents were not considered by the 16th ICLS to be occupational injuries. However, if a country wishes to collect data on commuting accidents (see chapter 4), it was recommended that the injuries be counted separately, using the following definition:

Commuting accident: an accident occurring on the habitual route, in either direction, between the place of work or work-related training and: the worker's principal or secondary residence; the place where the worker usually takes his or her meals; or the place where he or she usually receives his or her remuneration; which results in death or personal injury.

Case of occupational injury: This is defined as *the case of one worker incurring an occupational injury as a result of one occupational accident.* Several people may be injured in the same accident, and it is important to have information about each of the persons and their respective injuries. A person may also be the victim of several occupational accidents during a reference period and, here again, it is important for information to be available about each of the events and injuries. Thus, the unit of observation for the statistics is the individual person injured in one occupational accident.

Workers: A discussion on concepts and definitions concerning statistics on occupational injuries should necessarily cover the term "worker", since the injuries are incurred "while engaged in an economic activity (industry) or at work or carrying on the business of the employer".

At the time of the accident, the person is employed, working either as an employee for an employer or in a self-employment job. In this connection, the resolution concerning statistics of the economically active population, employment, unemployment and underemployment, adopted by the 13th ICLS (1982), defines the employed as comprising *all persons above a specified age who during a specified brief period, either one week or one day, were in the following categories: (a) "paid employment"..., (b) self-employment.*[1]

These concepts were further expanded by the 15th ICLS in 1993 in its *Resolution concerning the International Classification of Status in Employment* (ICSE), as follows:

Paid employment jobs: those jobs where the incumbents hold explicit (written or oral) contracts which give them a basic remuneration which is not directly dependent upon the revenue of the unit for which they work. ... (Persons in "paid employment jobs" are typically remunerated by wages and salaries, but may be paid by commission from sales, by piece-rates, bonuses or in-kind payments such as food, housing or training.)

Employees: all those workers who hold the type of jobs defined as "paid employment jobs".

[1] See http://www.ilo.org/public/english/bureau/stat/res/index.htm for the full text.

Self-employment jobs: those jobs where the remuneration is directly dependent upon the profits (or the potential for profits) derived from the goods and services produced (where own consumption is considered to be part of profits). The incumbents make the operational decisions affecting the enterprise or delegate such decisions while retaining responsibility for the welfare of the enterprise.

Employers: those workers who, working on their own account or with one or a few partners, hold the type of job defined as a "self-employment job" and employ paid employees.

Own-account workers: those workers who, working on their own account or with one or more partners, hold the type of job defined as a "self-employment job" and have not engaged on a continuous basis any "employees".

Members of producers' cooperatives: those workers who, working on their own account or with one or more partners, hold the type of job defined as a "self-employment job" in a cooperative producing goods and services, where each member takes part on an equal footing with other members in determining the organization of production, sales and/or other work of the establishment, and the investments and the distribution of the proceeds of the establishment amongst their members.

Contributing family workers: those workers who, working on their own account or with one or more partners, hold the type of job defined as a "self-employment job" in a market-oriented establishment operated by a related person living in the same household, who cannot be regarded as a partner, because their degree of commitment to the operation of the establishment, in terms of working time or other factors to be determined by national circumstances, is not at a level comparable to that of the head of the establishment.

These categories define the *status in employment* of the worker.

Another important concept to be considered, in relation to the statistics of occupational injuries, is the *occupation* of the worker at the time of the accident. Information about the occupations of victims is an extremely important element in the analysis of occupational injuries. In the resolution concerning the revision of the International Standard Classification of Occupations (ISCO),[2] the 14th ICLS stated that the classification of occupations classifies persons through their relation with jobs, and that jobs are classified with respect to the type of work performed. An occupation is defined in terms of the "skill" level and "skill specialization" required to carry out its tasks and duties.

Establishment: The conceptual framework at the beginning of this chapter situates the worker within an establishment. The characteristics of the establishment employing the injured worker are important for the analysis of occupational injuries, and include the economic activity (industry), the size of the establishment (in terms of the number of workers employed) and its location.

[2] See http://www.ilo.org/public/english/bureau/stat/res/index.htm.

The establishment is the unit that employs the worker, whether employee or self-employed, and it is the *economic activity (industry)* of the establishment that determines the economic activity (industry) of the worker. According to the *International Standard Industrial Classification of All Economic Activities* (ISIC)[3] an establishment is an autonomous part of an enterprise which exclusively or principally carries out a single type of economic activity (industry) at a single location. This may be a farm, mine, factory, workshop, shop, store, office or other type of unit. It may not necessarily be the physical location where a person works. For example, the employing establishment could be a factory, but the worker drives a lorry delivering goods produced by the factory. A bricklayer may be employed by a construction company, but the work is carried out at a building site. A cleaner may be employed by a firm that contracts to clean offices, so the work is actually carried out in those offices. It should be noted that there are many enterprises that in fact consist of only one establishment. This is particularly so in the informal sector.

The *economic activity (industry)* of the employing unit and the *occupation* of the injured worker are two of the most important elements for the analysis of occupational injuries. Along with data on the sex and age of the worker, they enable the researcher to identify, and hence target, those workers who are most at risk. In many countries health and safety regulations fix certain requirements for safety equipment and procedures in terms of the number of workers employed. Data on the size of the establishment can be used to study how these programmes and procedures are implemented and to determine the impact of size on levels of risk.

Location of the accident: This is the location where the person was present or working when the accident occurred. It may be the usual workplace of the person injured or somewhere else within the establishment. It could also be outside the establishment buildings but still on its premises, such as in a parking area or pathway between buildings. It might be a location away from the establishment while the worker was on official travel or at a meeting or on training away from the establishment.

Work process: This is the main type or kind of work that the worker was carrying out at the time of the accident. It is not the occupation of the worker or the economic activity (industry) in which he or she works, which are broader concepts. It is a description of the type of activity or work being performed during the period of time ending at the instant of the accident, i.e. a subset of the tasks covered by the occupation of the victim. Examples of work processes are maintenance, repair, tuning and adjusting of machines and equipment; fishing, services, care and other assistance to human beings; buying and selling and associated commercial activities; and sporting and artistic activities.

[3] See http://unstats.un.org/unsd/industry/default.asp.

Specific activity: This is the activity actually being carried out by the worker when the accident occurred. It may be an activity that is carried out for just a short time or one that takes a long period. It is one of the tasks that forms part of the work process. Examples of specific activities are starting a machine, operating a machine, driving a vehicle, using a hand tool, carrying a load, filling a container, digging the ground, painting an object, ironing, opening a package, climbing a ladder, walking and standing in a queue. As can be seen in the conceptual framework, the victim may be using an item, material or object (material agency) when the accident occurs, but not always.

Material agency associated with the specific activity: This is the item, agent, object, material or product associated with the specific activity of the worker at the time of the accident. It may be a tool, piece of equipment, object, element or material that was being used by the victim when the accident happened. This may not necessarily be the agency that caused the injury, nor is it necessarily implicated in the accident itself. The material agency can take many forms, including buildings, working areas, ladders, pipes, motors, hand tools, machines, containers, vehicles, safety devices, chemicals, sports equipment, animals, other human beings, plants and waste material.

Deviation from the normal: This is the deviation from the normal way of working or the normal process, i.e. what went wrong. It is the event leading to the accident, but it does not assign responsibility for the accident to any person and does not constitute the "cause". There may be a series of several interlinked or successive events preceding the accident, but the deviation that is used in the statistics is the last one before the person was injured. A deviation may take the form of something breaking or bursting, losing control of a machine, tripping over something, lifting something in an inappropriate way, aggression by another person, being attacked by an animal, falling and so on. Sometimes there is an item, tool, material or object that is linked to the abnormal occurrence or abnormality of the process, known as the material agency.

Material agency associated with the deviation: This is the item, agent, object, material or product associated with the deviation from the normal that resulted in the accident. It may be a tool, piece of equipment, object, element or material that was linked to the deviation from the normal, but may not be the agency that caused the injury. The material agency can take many forms, including buildings, working areas, ladders, pipes, motors, hand tools, machines, containers, vehicles, safety devices, chemicals, sports equipment, animals, other human beings, plants, waste material and natural phenomena such as noise, radiation, floods, ice and so on. In some cases, it is important to know whether the material agency was stationary or moving at the time of the accident.

Mode of injury: This relates to how the worker was injured by physical contact with an item, element, object or material (material agency) which caused an injury or was psychologically affected by an event. A person may receive several injuries in the same accident, which may or may not be caused by the same material agency. For statistical purposes, the mode of the most serious injury should be taken into account. (In this context, "most serious" refers to the injury resulting in the longest incapacity to work.) Examples of the way a person may be injured include coming into contact with electricity, extreme temperatures or hazardous substances, being buried under something, falling, crashing into something, being struck by something, being in contact with a sharp object, being trapped or crushed by something, making efforts that are too strenuous thereby overloading the body, mental shock, being bitten or kicked or hit by an animal or person.

Material agency associated with the injury: This is the item, agent, object, material or product with which the victim came into contact during the accident and which caused the injury or the psychological phenomenon. It may be the same as the material agency associated with the specific activity of the victim at the time of the accident, or the material agency linked to the deviation from the normal which led to the accident, but this is not always the case. As has been seen earlier, the material agency can take many forms, including buildings, working areas, ladders, pipes, motors, hand tools, machines, containers, vehicles, safety devices, chemicals, sports equipment, animals, other human beings, plants, waste material and natural phenomena such as noise, radiation, floods, ice and so on. Here, also, it is useful, in some cases, to know whether the material agency was stationary or moving when it caused the injury.

Type of injury: This is the type of injury sustained by the victim. A person may receive several injuries in an accident, but for statistical purposes, it is the most serious injury received that is used for analysis. They can range from minor superficial wounds such as scratches or bruises, to more serious injuries including fractures, sprains, amputations, concussions, other internal injuries, burns, frostbite, poisoning, infection, asphyxiation, or the effects of physical or psychological phenomena, such as radiation, heat, cold, abuse, noise and so on.

Part of body injured: This is the part of the body that was injured. If several injuries were received, for statistical purposes it should refer to the part of the body sustaining the most serious injury. It may also be useful to indicate the side of the body that was injured. Only in cases where there were several injuries to different parts of the body and no injury was obviously more severe than the others should a grouping of locations be used, such as "multiple locations".

Consequences of the injury: This refers to the severity of the injury in terms of whether it was fatal or whether it led to incapacity for work, temporary or permanent, or to restricted activity or simply required first aid or minor medical treatment.

Scope and coverage 4

The international standards mentioned in chapter 2 recommend that statistics on occupational injuries, whatever their source, should be as comprehensive and complete as possible. In practice, however, the coverage and scope of these statistics are determined by their source. For example, if the data about occupational injuries are collected through an establishment survey, the scope and coverage will be fixed by the coverage of that survey in terms of types, sizes and locations of establishments and types of workers employed in those establishments, as well as the information available in those establishments. Household survey data will be limited by the types of households covered and the types of information that are available in those households. Whatever the source, the objective should nonetheless be for the statistics to have as broad and full coverage as possible.

Scope and coverage may be considered in terms of the occupational injuries and accidents themselves, as well as in terms of workers. This chapter outlines the issues involved in each of these areas.

Occupational injuries and occupational accidents

The 16th ICLS resolution advocates that: *"the various sources of statistics should, where practical, cover all occupational injuries, as defined..., including non-fatal injuries causing absence from work of at least one day, excluding the day of the accident, and fatal injuries"* (see Annex 1, ICLS, ILO, 1998).

As seen earlier, the consequences of occupational injuries may range from the most serious, i.e. death, to the slightest, such as a cut or bruise that may or may not need first aid or cause the victim to stop working. In order to have comprehensive statistics, it would be useful to be able to cover all occupational injuries, however slight they might be. In practice, this would be almost impossible to

achieve for a number of reasons. The minor injuries are most frequent, but may not have much impact in terms of incapacitating workers or loss of working time. Even if first aid is required, this fact may not be recorded, either by the employer or the worker, and without records it is often difficult for either to recall how many injuries were incurred, let alone the types of injury and other details. Where an injury is serious enough for a person to stop working for one or more days, this fact is generally recorded somewhere or at least becomes memorable since earnings are affected or compensation is payable. It is also probable that, even if earnings or incomes are not affected by such an absence or inability to work, the victim and his or her relatives or employer would remember and be able to provide reasonably reliable information in this connection. It was for this reason that the 16th ICLS decided that the statistics should cover, in addition to fatal injuries, non-fatal injuries leading to absence from work of one day or more, excluding the day of the accident.

The 16th ICLS also made recommendations concerning the reference period for which the statistics on occupational injuries should be collected, i.e. one calendar year. This has implications for the coverage of the cases of fatal occupational injury. For a fatality occurring immediately following an occupational accident, there is evidently no problem. Other fatalities may occur shortly after or much longer after the accident. A standard is therefore needed to provide guidance for statistical purposes. Unless a time limit is applied there may be delays in disseminating data and past data may be continually revised. As a result, the 16th ICLS decided that the statistics should cover cases of fatal occupational injury where the death took place within a period of one calendar year from the day following the day of the accident. A death due to an occupational accident that occurred more than one year after the day following the day of accident is therefore excluded. This evidently means that some cases of fatal occupational injury fall outside the scope of the statistics, but the 16th ICLS considered that, for practical purposes, and since in general their number is low, such a time limit was necessary.

Commuting accidents are not included in the definition of occupational accidents adopted by the 16th ICLS. However, they are closely associated with the work environment and are often considered as occupational accidents for insurance purposes. Moreover, in certain countries, employers traditionally provide transport for employees to and from work, and this transportation is often the subject of negotiation between workers and their employers. A number of countries compile data on cases of injury due to commuting accidents along with data on cases of occupational injury. In view of this, the 16th ICLS recommended that, where countries do decide to cover commuting accidents, the statistics for the corresponding cases of injury should be compiled and disseminated separately from those relating to cases of occupational injury.

An occupational accident may occur not at a worker's regular or fixed work site, but while *travelling* during the course of work. This may happen while the person is engaged in his or her work or carrying on the business of the employer. The travelling can be by different means of transport, i.e. while walking, or by road transport, boat, plane, etc. This type of accident differs from a commuting accident in that it refers not to travel between the worker's home and the place of work, but while the worker is travelling as part of his or her work. As such, cases of fatal injury or non-fatal injury with at least one day of incapacity resulting from accidents that happen while travelling during the course of work should be covered in the statistics. Examples of this type of accident include, a lorry driver injured while delivering goods to a client, a nurse injured while cycling to attend a patient, a secretary injured while walking to the post office to post letters for the employer, a farmer injured while wheeling a barrow of produce to sell at a market and a labour inspector injured while travelling by bus to carry out an inspection of a factory.

Similarly, an accident may happen while the worker is away from the regular or usual workplace or workstation, such as in washrooms or locker rooms, during training, in workplace canteens, in parking areas or garages, etc. A worker may also be injured when attending a conference or meeting away from the normal workplace, even in another town or country. Provided the accident happens while the person is considered to be at work or carrying out an activity in connection with the business of the employer, this is considered to be an occupational accident, and a fatal or incapacitating injury incurred as a result of the accident should be included in the statistics.

Workers

For the statistics of occupational injuries to be as comprehensive and complete as possible, the 16th ICLS proposed that *"where practical, the statistics should cover all workers regardless of their status in employment (for example, employee, employer and own-account worker). The coverage should include child workers, informal sector workers and homeworkers, where they exist"* (see Annex 1, ICLS, ILO, 1998).

The 16th ICLS did not condone the employment of children, but recognized that the phenomenon existed and felt that the risks of injury to child workers should therefore be measured. This is particularly important, as little is known about such injuries. Consequently, where possible, the statistics of occupational injury should include child workers. The definition of a child worker varies between countries, in terms of age groups, types of work and coverage by labour legislation. It is recommended that where child workers exist, whatever the definition used in the country, they should as far as possible be covered by the

statistics of occupational injuries.[1] The 16th ICLS suggested that, because of the difficulties involved in obtaining such data through traditional sources, they and other special population groups, such as disabled workers in sheltered workshops, could be the subject of special studies.

Occupational accidents are incurred by all types of workers, not just those in the traditional, regular type of paid employment covered by many countries in their statistics up to now. Forms of paid employment and self-employment are continually evolving or emerging, whether in the formal sector or the informal sector, and workers in all types and forms of employment run the risk of occupational injury. Thus, all workers should be covered in the statistics.

According to the resolution concerning statistics of employment in the informal sector, adopted by the 15th ICLS in 1993, the informal sector may be broadly characterized as consisting of units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned. These units typically operate at a low level of organization, with little or no division between labour and capital as factors of production and on a small scale. Labour relations – where they exist – are based mostly on casual employment, kinship or personal and social relations rather than contractual arrangements with formal guarantees.[2]

In parallel with the growth of the informal sector in many countries, another form of "informalization" of employment has taken place, especially in economies undergoing rapid transformation. This includes various forms of informal (or non-standard, atypical, alternative, irregular, precarious, unprotected, etc.) employment, not covered by existing regulations on employment conditions, entitlement to employment benefits, social protection, etc.[3]

Special attention needs to be taken to ensure that women workers are properly included in the statistical coverage. Because they tend to occur less frequently and are generally less serious in terms of physical consequences, occupational injuries incurred by women are not fully revealed in the national statistics that are currently compiled in most countries. It is important that, when determining the scope of the statistics in this area, account be taken of the work and working arrangements of women so as to permit sufficient analysis of their occupational injuries.[4]

In line with the international standards mentioned in chapter 2, the 16th ICLS recommended that, as far as possible, the statistics on occupational injuries should cover the whole country, *all branches of economic activity (industry) and all sectors of the economy.*

[1] For more information on the concept of child labour see http://www.ilo.org/ipec/index.htm.
[2] For more details see http://www.ilo.org/public/english/bureau/stat/.
[3] See the guidelines concerning a statistical definition of informal employment, adopted by the 17th ICLS (2003) at http://www.ilo.org/public/english/bureau/stat/download/guidelines/defempl.pdf.
[4] See the checklist of good practices for mainstreaming gender in labour statistics at http://www.ilo.org/public/english/bureau/stat/download/guidelines/mstrm.pdf.

Issues as to where a case of occupational injury should be counted arise when looking at the *geographic coverage* of the statistics. A person may be injured while working outside the country of normal residence, for example, if he or she is travelling for work to another country, or temporarily assigned to a workplace in another country. In this case, the case of injury should be included in the statistics of the country in which the accident took place, since it is that country which is responsible for accident prevention.

Regarding the coverage of *economic activities* and *sectors of the economy*, the 16th ICLS recommended that statistics should be compiled for all activities and sectors. Current national practices often exclude defence and police forces from their statistics for a number of reasons. However, in order for proper accident prevention programmes to be established, it is important that these be covered in the statistics compiled.

Types of data and measurement 5

This chapter examines the most useful types of data that can be compiled regarding occupational injuries, as well as the information needed to construct basic indicators needed for analysing the data. Measurement issues are also discussed in relation to certain variables, as are the classification schemes for use with certain variables.

It is recalled that the types of data outlined here are intended to be collected in surveys of households or of establishments and may differ somewhat from those collected through notification systems.[1] These data are collected with respect to individual *cases of occupational injury,* as described in chapter 3. The information collected may be numeric (for example, workdays lost) or descriptive (for example, type of injury). It is preferable to collect the data for most variables in the form of codes corresponding to categories in an appropriate classification scheme. The internationally recommended schemes are therefore also discussed in this chapter, along with the variables.

Types of data

A very wide range of information may be collected in relation to an individual occupational injury, concerning the worker, the establishment employing him or her, the occupational injury and the occupational accident causing the injury. Reports of occupational injuries submitted to accident compensation schemes or to the public authorities responsible for occupational safety and health include considerable detail. For statistical purposes, it would be impractical to try to collect all these types of data through surveys. Nonetheless, sufficient information is needed to determine the occupations and economic activities where occupational accidents occur most frequently and with the most serious consequences, in relation to different groups of workers, so as to make meaningful basic data available to those involved in accident prevention. This will enable the effective targeting and planning of prevention programmes, as well as the monitoring of these programmes.

[1] Annex 6 provides some information about the types of data covered by the international guidelines on the recording and notification of occupational injuries. It also includes, as examples, selected national reporting forms.

Recognizing that a progressive approach to the collection of data would be the most practical way to ensure that relevant information could be made available to users, the 16th ICLS recommended a strategy consisting of two stages, as set out in table 5.1. The first stage comprises a basic data set, which all countries should aim at collecting, as a minimum, for identifying the occupations, economic activities and personal characteristics of persons injured in occupational accidents. These are needed to meet the basic objectives of determining the priority areas on which prevention programmes should focus. The second stage provides for the collection of more detailed information about the accident and its consequences. In order to understand why an occupational accident occurred and how an occupational injury is incurred, information is needed about the chain of events leading to the accident and the injury. It is also useful to have more information about the consequences of the accident, in relation to the severity of the injury.

Table 5.1
Types of data

Minimum data set	Extended data set
Information about:	**Information about:**
a) the establishment: location, economic activity (industry), size (number of workers)	
b) the person injured: sex, age, occupation, status in employment	
c) the injury: fatal or non-fatal, type of injury, part of body injured	**c) the injury:** incapacity for work (days of incapacity for work)
d) the accident and its sequence: type of location, date and time, mode of injury, material agency of injury	**d) the accident and its sequence:** shift, start time of work, hours worked when accident occurred; number of workers injured in accident; place of occurrence; work process; specific activity; material agency associated with specific activity; deviation resulting in the accident; material agency associated with deviation

Information about the establishment

The information about the establishment covers the injured worker's employer, or the unit in which a self-employed person worked, and provides inputs for identifying the geographic areas, economic activities and sectors, as well as the sizes of employing units where occupational injuries are incurred.

Location: This is the geographic location of the employing unit. The level of detail at which this information is collected will depend on the size of the country and the regional breakdowns used for statistical purposes. This variable should be coded according to the national classification scheme, at the level of detail suitable for providing data for the relevant individual regions or areas.

Economic activity (industry): As stated in the previous chapter, this is one of the most important items of classification for the analysis of occupational injuries, and it refers to the type of industry or branch of economic activity in which a person works. This characteristic is particularly interesting from an analytical point of view, since it is not a characteristic of the person himself or herself, but is defined solely in terms of the kind of goods produced or services supplied by the unit in which the person works. Thus, two persons working for the same economic unit have the same economic activity (industry), even though the actual jobs they do in that unit may be very different.

If information on occupational injuries is being collected from the employer or the employing establishment, the "industry" code of the establishment in which they work may be available from a business register. Even so, this code needs to be confirmed during data collection, in case there has been a change in the main activity of the establishment or in case the code in the business register was incorrect. If the information is being collected through a household survey, the person answering the questions may not necessarily know the relevant economic activity (industry) and it may be necessary to ask several questions in order to identify the industry in which each job was carried out during the survey reference period. Two complementary questions should be sufficient to obtain the necessary information. The first ("What kind of industry, business, service or activity is carried out at the place where the person worked... *during the reference period?*") serves to find out the actual economic activity (industry) of the establishment in which the person worked. The second ("What are the main products or services produced at the place of work, or what are its main functions?") relates to the kind of products or services supplied by that establishment. This more detailed information helps to ascertain specifically the industry in which the establishment falls.[2]

[2] Further background information on many of the variables discussed here can be found in: Ralf Hussmanns, Farhad Mehran and Vijay Verma, *Surveys of economically active population, employment, unemployment and underemployment: An ILO manual on concepts and methods,* International Labour Office, Geneva, 1990, pp. 162–165.

The 16th ICLS recommended that the statistics on occupational injuries be classified according to the *International Standard Industrial Classification of All Economic Activities* (ISIC).[3] Revision 3 of this classification, ISIC-Rev. 3, allows for coding at four levels. At the broadest level are the 17 tabulation categories, where industries are coded alphabetically. For instance, tabulation category A covers agriculture, hunting and forestry; category B covers fishing; and category C covers mining and quarrying. If more detailed coding is required, the tabulation categories can be successively divided into 60 divisions (using two-digit codes), 159 groups (using three-digit codes) or 292 classes (using four-digit codes).

The tabulation categories are likely to provide an adequate level of detail for most analytical purposes, but where occupational injury rates are high for a particular industrial sector, it may well be desirable to use more detailed divisions, groups or even classes, to pinpoint exactly those types of industry where occupational injuries occur most often or are most severe. For this reason it is always desirable to code data on industry to the most detailed level possible, even though this may require rather more work on the part of coding staff or enumerators.

Size of establishment: This is another useful variable for analytical purposes. Larger establishments may be the subject of regulations or laws covering the reporting and notification of occupational injuries to the relevant authorities or the compensation of occupational injuries. They may also be required to establish their own programmes for the prevention of occupational injuries, including the formation of health and safety committees involving both management and workers. Even where such requirements do not exist, some establishments, particularly the larger ones and those in certain highly organized activities, may have their own safety and health policies. Analysis of cases of occupational injury by size of establishment helps to throw further light on how occupational injuries are dealt with in establishments of different size.

Including a question about size of establishment in a survey also permits comparisons of occupational injury data from different sources. For instance, in an establishment survey, there is often a minimum cut-off point, in terms of number of workers employed, for establishments to be included in the survey coverage. To compare data from such a survey with those from a household survey covering the entire population, the latter would need to include a question about size of establishment, so that information on cases of injury in establishments below the cut-off size can be set aside.

[3] See United Nations, *International Standard Industrial Classification of All Economic Activities*, statistical papers, series M, No. 4, Revision 3, New York, 1990. At the time of writing, a structure for Revision 4 had been adopted by the Statistical Commission; see http://unstats.un.org/unsd/.

Size of establishment is often used as one measure, along with others, in determining which establishments should count as being in the informal sector. For instance, it might be decided that the informal sector could be approximated by taking all establishments in the non-agricultural sector with fewer than ten employees. To be able to analyse data on occupational injuries in the informal sector, size of establishment should be included as one of the variables in the data collection system.

A decision may need to be made about what coding system to use. One alternative would be to ask an open question and allow the respondent (the household member or the manager of the business establishment) some latitude in their response, since it may be difficult in a very large establishment to be precise about employment size. The advantage of asking an open question is that no information is lost, and the variable provides more scope for use in analysis. If grouped data are required, the groups can be created at a later stage. A question such as "How many people (including yourself) are employed in the establishment where you work?" could be used.

Annex B of the 16th ICLS resolution[4] shows possible codes for use either on the questionnaire, or later in the analysis. In terms of numbers engaged in the enterprise, establishment or local unit, the following groupings are suggested: 1–4, 5–9, 10–19, 20–49, 50–99, 100–149, 150–199, 200–249, 250–499, 500–999, 1000+, size unknown. Regarding this last code, it is highly recommended that an estimate be obtained from the respondent (even if only rough), rather than no information being provided at all. For presentation purposes, and depending on the size and economic structure of the country, it may be desirable to have a smaller number of groups than those shown above. A possible grouping might be: 1, 2–4, 5–9, 10–19, 20–99, 100+. In this suggested example, establishments with only one person have been separated out, since the self-employed working alone would seem to constitute a particularly important group that is worth identifying.

Alternatively, the question might be asked in the form, "How many other people are employed in the establishment where you work?" In this case, it would be best if the question were left open, since the ranges for the comparable precoding (0–3, 4–8, etc.) would be rather unattractive and impractical. The obvious point to note in this case is that zero is acceptable as a response, in all cases where a person works alone. The data collected could then be converted at the analysis stage to the earlier form if desired, by adding one to each response.

[4] See Annex 1.

Information about the person injured

Sex: It is important that data on occupational injuries be disaggregated by sex. Men and women tend to do very different jobs, and therefore face very different hazards. A brief examination of the figures presented in the ILO *Yearbook of Labour Statistics* highlights the fact that, even if countries do collect some data on occupational injuries, many of them do not disaggregate those data by sex. For instance, for almost two-thirds of the countries listed in table 8A (Cases of injury with lost workdays) of the 2006 *Yearbook*, Volume 1, the figures are not disaggregated by sex, and there are wide variations between regions. While the majority of the countries in Europe have disaggregated data, only two countries in Africa (Namibia and South Africa) have been able to provide some separate data for men and for women.

The use of the term "sex" here refers to the biological division into male and female. This distinction is useful for a descriptive documentation of any data collected on occupational injuries. Analysis of the data may also help to shed light on the gender differences between masculine and feminine roles in society, which reflect social and cultural differences in society. For instance, a country might experience a high rate of occupational injury, or even fatality, in the mining sector. Further analysis by sex will probably show that these injuries and fatalities are occurring predominantly to men, since it is mainly men that are employed in the mining sector. Any overall assessment of the different occupational injury experiences of males and females will need to take account, not just of the differing distributions of males and females across industries, but also of the differences across occupations within a particular industry, since females may tend to be concentrated in certain occupations.[5]

Age: Age is another important variable. It can be used simply as a descriptive category, so as to provide a useful breakdown of occupational injury data. A simple presentation of occupational injury data by age may help to shed light on the pattern of occupational injuries, and this may help to highlight certain aspects of the data that require further investigation. Alternatively age may be used as an explanatory variable, along with other variables, in order to see how age affects the levels of occupational injury experienced by different sections of the population. In the case of a household survey, for example, if data are collected on persons below the legal minimum age for working, this may help to identify activities and occupations where child workers are most at risk.

A particular advantage of using age as one of the survey variables is that it is a continuous variable. It allows the presentation of data in a number of ways, and the performance of certain kinds of statistical manipulation on the data. It is most useful if the information on age is collected in terms of single years. At the analysis stage the data can then be grouped together into age groups for the calculation of rates or for presentation in the form of tables. The groups used should ideally correspond to the five-year or ten-year age groups commonly

[5] See *Incorporating gender issues in labour statistics*, by Adriana Mata Greenwood, STAT Working Papers (ILO Bureau of Statistics, Geneva, 1999).

used in the country's population census or other major surveys, so as to allow easy comparison of figures.

Various approaches can be used for collecting data on age. In the model questionnaires included in this manual, information on age has been asked in the form of "age in completed years" in the establishment questionnaire and as "age last birthday" in the household survey questionnaire. Another approach would be to ask for "year of birth". This information might be easier to obtain, particularly in the case of establishment surveys, but this would evidently require a calculation at the data processing stage.

Occupation: Along with economic activity (industry), occupation is an extremely useful variable for analytical purposes, since it helps to identify those occupations where occupational injuries are most frequently incurred or where the most serious injuries occur.

Here the term "occupation" refers to the kind of work done by the person, irrespective of his or her economic activity (industry) or status in employment. In the present context, a job is defined as a set of tasks and duties which are carried out by, or can be assigned to, one person.

There are an enormous number of different jobs in each country. For analytical purposes it is essential to organize the occupations in some suitable form, so that the information on jobs can be easily presented and analysed. This is done by means of an occupational classification, which groups together occupations of a similar kind in a hierarchical order. Many countries have produced their own occupational classifications. Where a country is producing an occupational classification, it is extremely helpful if it is based as far as possible on international standards, so that results from one country can be compared with those from another. The 16th ICLS recommended that, where possible, the data compiled on occupational injuries be classified using a scheme that is comparable with, or can be converted to, the most recent version of the relevant international standard, which in this case is the International Standard Classification of Occupations (ISCO). At the time of writing, the latest version is the one adopted by the 15th ICLS in 1988, ISCO 88.[6]

In order to calculate occupational injury rates, it is necessary to collect much more data on jobs than are normally collected in a population census. The question about occupation in a population census normally refers only to current economic activity, which is a person's economic activity during a short reference period, such as the last week. Some surveys (such as labour force surveys) may also collect information on usual economic activity, which refers to a person's usual economic activity status over a much longer period such as a year.

[6] See *International Standard Classification of Occupations,1988* (ILO, Geneva, 1988) and http://www.ilo.org/public/english/bureau/stat/isco/index.htm. At the time of writing, ISCO-88 was being updated.

Since occupational injury data are collected through surveys in respect of a relatively long period (normally a year),[7] the information on jobs should cover that period as well. It is therefore necessary to collect information in respect of all jobs that a person has held during that period. It is appropriate here to stress that it is not adequate to collect information only in respect of the job held by a person when an occupational injury occurred. If that were the case, there would be correct information for the numerator of an incidence rate, but the information for the denominator of the rate would not be sufficient.[8] The latter figure needs to reflect total exposure to risk of an occupational injury in terms of the number of all jobs held by all persons during the reference period.

Status in employment: This is usually a useful variable for analysing employment data from any type of source. The 16th ICLS recommended using a classification scheme that is comparable with, or convertible to, the most recent version of the International Classification of Status in Employment (ISCE). At the time of writing, this is the ICSE adopted by the 15th ICLS in 1993 (ICSE-93), which provides a classification for all jobs held by persons.[9] Each job is classified with respect to the type of explicit or implicit contract of employment of the person with other persons or organizations. The basic criteria used to define the groups of the classification are the type of economic risk, an element of which is the strength of the attachment between the person and the job, and the type of authority over establishments and other workers which the job incumbents have or will have.

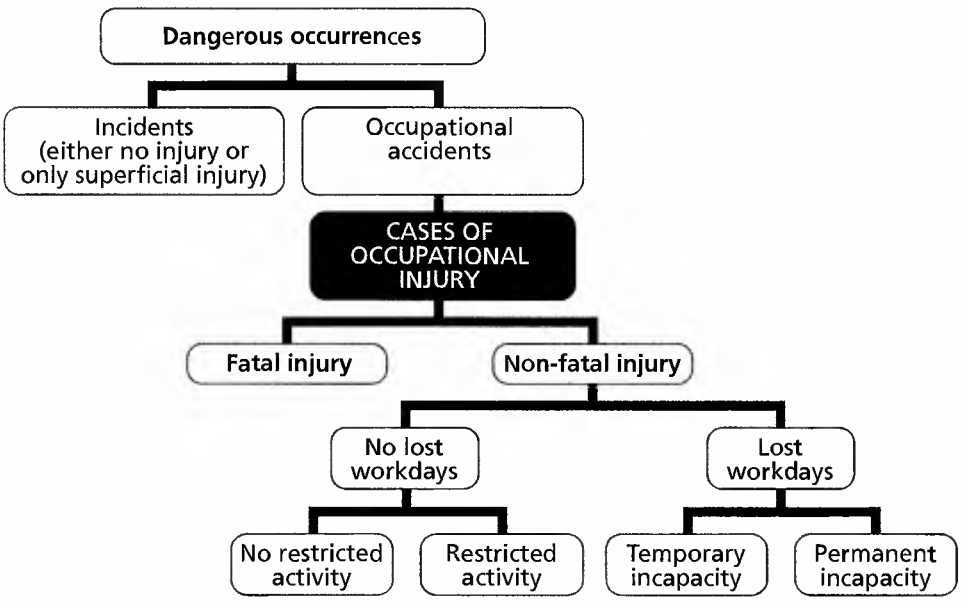
ICSE-93 divides persons into five main groups: employees; employers; own-account workers; members of producers' cooperatives; and contributing family workers. There is also a residual sixth group for workers whose status cannot be classified into any of the five main groups. As noted in the resolution establishing this classification, the five groups are defined with reference to the distinction between "paid employment" jobs on the one side and "self-employment" jobs on the other. Groups are then defined with reference to one or more aspects of the economic risk and/or the type of authority which the explicit or implicit employment contract gives the incumbents or to which it subjects them (see chapter 3).

[7] See chapter 7, on *Reference period.*
[8] See the section on *Indicators* in Chapter 6.
[9] For more information, see http://www.ilo.org/public/english/bureau/stat/class/icse.htm.

Information about the injury

It is useful at this point to consider the possible outcomes of accidents and injuries. An occupational accident is a dangerous occurrence. Some dangerous occurrences result in injuries, thus constituting an occupational accident, or no injury at all. The injuries may be slight or superficial, and may or may not result in incapacity for work, or restricted activity. Figure 5.1 illustrates the different scenarios.

Figure 5.1
Types of occupational injury



Fatal or non-fatal: This indicates the basic consequence of an injury, in terms of whether it led to a death or to an incapacity for work. For the purposes of the statistics, a ***fatal occupational injury*** refers to an injury where the death took place within a period of one calendar year from the day following the day of the accident.[10] A ***non-fatal occupational injury*** refers to an injury causing incapacity for work of at least one day excluding the day of the accident.

In the case of a non-fatal injury, the person may have "lost time" as a result of the injury. The measurement of lost time is discussed further under "Days lost". Where there is lost time, it is usual to distinguish between two types of occupational injury: those resulting in temporary incapacity and those resulting in permanent incapacity. ***Incapacity*** here refers to the inability of the victim of an occupational accident to perform the normal duties of work in the job or post occupied at the time of the occupational accident. In practice, this inability may be temporary or permanent.

[10] See later in this section on measuring cases of fatal occupational injuries.

In a case of ***temporary incapacity***, one of three events has taken place:

a) the person has already returned to work at the same job he/she had at the time of the accident; or

b) he/she has returned to work but not to the same job, but the reason for the change of job is unrelated to his/her ability still to perform that job (e.g. that job was no longer available as someone else had been taken on to carry out the work during the victim's absence); or

c) he/she is still off work, but is expected to be able to perform the old job when he/she returns, and the expected total absence from work will be less than a calendar year (excluding the day of the accident).

On the other hand, a ***permanent incapacity*** can arise in one of three ways:

a) the person has already returned to work but not to the same job because he/she is no longer able to perform the duties of that job; or

b) he/she is still off work and it is expected that he/she will not now be able to perform the duties of the old job; or

c) he/she thinks he/she will be able to perform the old job, but the total time off work is expected to exceed a year.

Even where there is no lost time, the nature of the injury sustained in the accident may be such that the person is not able to perform the normal duties of the job performed at the time of the accident. Such a situation might usefully be referred to as a case of ***restricted activity*** (see figure 5.1). This type of situation was not provided for by the 16th ICLS in its resolution, since paragraph 6 specifically says that the statistics should cover fatalities and those non-fatal occupational injuries "causing an absence from work of at least one day, excluding the day of the accident". But experience in the pilot countries and elsewhere suggested that, in some cases of occupational injury, workers sustaining a genuine injury can only afford to stop working if they receive some kind of income from another source (unless they are very badly injured). The self-employed and those without accident insurance will carry on working somehow, even if they cannot do everything they would normally do.

It therefore seems worth trying to collect statistics on the extent of injuries involving restricted activity without lost workdays, but treating them separately from injuries with days lost. For cases of restricted activity, there are no lost workdays as such, although there may be a reduction in time worked. The essential point is that the person is not able to perform all the normal duties of the job.[11]

[11] The concept of restricted activity is in fact already used in the United States, where workers (particularly part-time workers) do not always have accident or sickness coverage. There, the term "days of restricted activity" is used to cover those days (consecutive or not) where, because of injury or illness, one of the three things happens:
a) the employee was assigned to another job on a temporary basis;
b) the employee worked at a permanent job less than full-time;
c) the employee worked at a permanently assigned job but could not perform all duties normally connected with it.

The final group shown in figure 5.1 refers to those persons injured in occupational accidents whose injuries did not lead to any incapacity for work or restriction of activity. In these cases, there was no loss of worktime, except for treatment, but the injuries are more serious than the superficial injuries like cuts and bruises that would be included in the group "incidents" as shown in figure 5.1.

Cases of fatal occupational injury are (fortunately) relatively infrequent. In Finland, for example, the rate of fatal injuries for workers in 2004 was 2.1 per 100,000 employees.[12] Thus, assuming that there is not normally more than one occupational fatality in a household in one year, it could be expected that several hundred thousand households would have to be interviewed in order to be able to collect information on enough occupational fatalities for the data to be reasonably reliable. Evidently a reference period of one year is therefore not sufficient for collecting data on occupational fatalities. Consequently, a reference period of at least five years is recommended for collecting information on ***cases of fatal occupational injuries***. This recommendation is for both household surveys and establishment surveys.

In terms of the *timing of the fatality,* two types of fatality are included: deaths that occurred at the time of the accident, and fatalities that occurred within 12 months of the accident. The analysis of data on occupational injuries poses a number of conceptual problems in this connection, which are worth examining in some detail.

The following illustrates the difficulties involved in measuring fatal occupational injuries in a household survey (carried out in September 2003), with a normal reference period of 12 months preceding the day of the interview. An occupational fatality was only counted as such if the fatality occurred within one year of the accident which gave rise to the fatality. (The question about fatalities included in this manual actually refers to fatalities occurring during the previous five years, but for simplicity fatalities are measured here for the most recent one-year period.) In figure 5.2, four possible scenarios for the occurrence of an occupational fatality are shown. The circle signifies the time the accident took place, and the cross indicates when the fatality occurred.

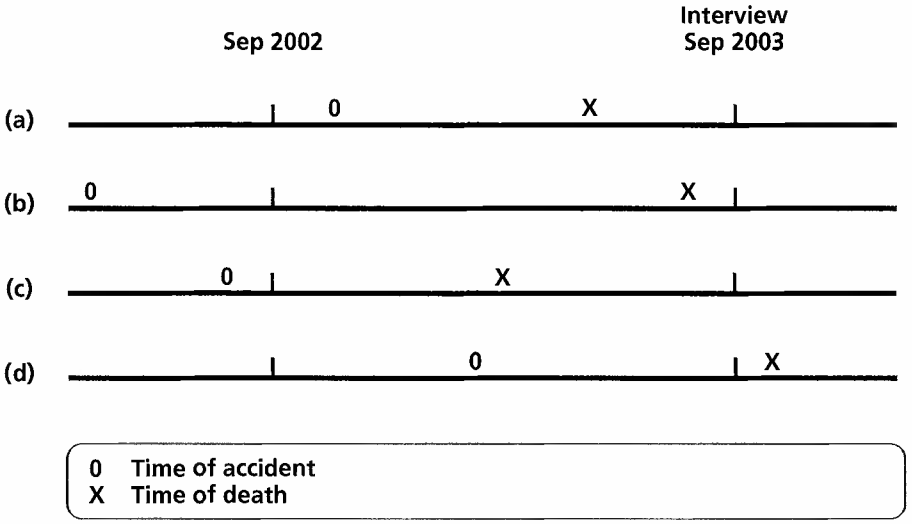
The situations illustrated in figure 5.2 should be dealt with as follows:

a) Both the accident and the fatality occurred during the 12-month reference period for the survey. The survey will record this fatality correctly.

b) The fatality occurred during the reference period but more than 12 months after the accident. The survey will collect information on this fatality, but it should not be counted at the analysis stage. (If a similar survey had been done one year earlier, this case would also have been recorded in that survey, but as a non-fatal injury.)

[12] See http://laborsta.ilo.org, table 8b.

Figure 5.2
Time intervals associated with occupational fatalities: Illustrations for a single year



c) The fatality occurred during the reference period and within 12 months of the accident, but the accident itself occurred outside the reference period (and would have counted as a non-fatal injury if a similar survey had been done 12 months earlier). Strictly speaking, according to paragraph 17 of the 16th ICLS resolution, "cases of fatal injury should be included in the statistics for the reference period during which the occupational accident occurred". However, it is appropriate to count this fatality for the purposes of the analysis, since it exactly balances another group of fatalities which have been omitted (see d) below).[13]

d) This case is the counterpart of c). In the survey a person is recorded as having had an accident during the survey period and has not returned to work (and will be counted as such in the survey), but as a result of this accident the person subsequently dies after the survey has taken place. Strictly speaking, the eventual fatality should be assigned back to this reference period, but this obviously cannot be done on the basis of the present survey data. In terms of getting the best estimate of fatalities, the omission of this group of fatalities is counterbalanced by the inclusion of the group of fatalities described in c) above. The assumption of counterbalancing will be satisfactory, provided that the overall trend in fatality rates from one year to the next is fairly steady.

As mentioned earlier, a reference period of at least five years should be used for the recording of occupational fatalities. With five years of data, it is first necessary to eliminate those fatalities that occurred more than 12 months after the accident. The resulting number of fatalities during the last five years is then divided by five to get the average annual number of occupational fatalities. In doing this calculation an assumption analogous to the situation described in c) and d) above is made. It is assumed that the small number of fatalities occurring

[13] Although this approach offers the best way of estimating fatalities, it is acknowledged that it introduces an element of double-counting, in that this same injury would have been reported as a non-fatal occupational injury if a survey had been carried out 12 months earlier.

in the first year as a result of accidents which took place in the previous year is exactly counterbalanced by a few fatalities that will occur in the year following the survey as a result of accidents occurring during the most recent 12-month period.

Quite apart from errors due to recall, particularly in household surveys, the estimate of total occupational fatalities will be biased slightly downwards as a result of two other factors. In a household survey, all fatalities occurring to people living permanently in institutions will be missed. However, emphasis needs to be given during the training of fieldworkers that all occupational fatalities occurring to household members should be included, even if the person was confined temporarily to hospital for some months as a result of the accident before dying. Other groups of occupational fatalities which will be missed are those occurring to people living as one-person households or the rare cases where all household members had died as a result of occupational accidents. As these households would no longer exist, they cannot be in represented in the sampling frame and so would have no chance of selection.

Days lost: This is a major variable to be measured for each case of occupational injury. The 1998 resolution recommends that:

14. Time lost should be measured separately for each case of occupational injury leading to temporary incapacity for work of a maximum of one year. In order to assess the severity of the injury, time lost should be measured in terms of the number of calendar days during which the injured person is temporarily incapacitated, based on information available at the time the statistics are compiled. If it is measured in workdays, attempts should be made to assess the total number of calendar days lost.

15. The time lost should be measured inclusively from the day after the day of the accident, to the day prior to the day of return to work. In the case of recurrent absences due to a single case of occupational injury, each period of absence should be measured as above, and the resulting number of days lost for each period summed to arrive at the total for the case of injury. Temporary absences from work of less than one day for medical treatment should not be included in time lost.

16. The time lost as a result of permanent incapacity for work or fatal occupational injuries may also be estimated. In these cases, the data should be compiled and disseminated separately from data relating to temporary incapacity for work.

(Resolution concerning statistics of occupational injuries (resulting from occupational accidents), adopted by the 16th International Conference of Labour Statisticians, 1998.)

In the case of injured persons who have returned to work, it should be fairly easy to find out how long they have been absent from work. There may be a particular problem in the case of persons who have recovered from their injuries but who have chosen, for some other reason, not to return to work. What is required in this case is an estimate of the number of days that the person was absent from work and not in a fit state to perform his or her normal work activities. In the case of a person suffering temporary incapacity who has still not recovered from his or her injury, the total number of days lost cannot yet be determined. However, a reasonable estimate of it could be obtained by adding together the number of days already lost and the person's (or their employer's) own estimate of how many more days he or she will be absent from work.

In collecting information on days lost, the interest is in calendar days, not workdays, since it is the duration of incapacity that determines the severity of the injury; workdays are a measure of the eventual financial cost of the injury. Thus, if a person was injured on a Friday, and was incapacitated over the weekend, but returned to work on the Monday, the incapacity should be counted as two days lost, even though there were no working days lost.

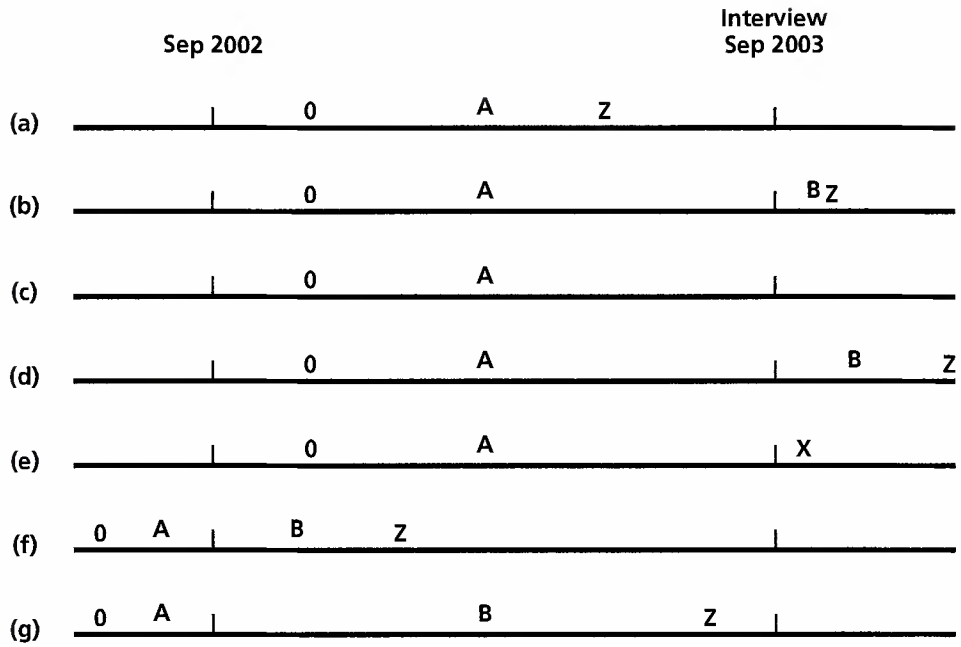
Figure 5.3 gives some specific examples of how to measure days lost. In this diagram, a circle represents the time of the accident, the letter Z represents the date of the return to work, X represents a fatality, the letter A represents the elapsed time between an accident and the date of the return to work (or the date of the interview if the person has not gone back to work) and the letter B represents the elapsed time after the interview until the person is expected to go back to work.

a) The person had an accident and returned to work, within the 12-month reference period. If the person returned to the same job (or was at least physically able to have returned to the same job, even if he or she did not), then this is counted as a case of temporary incapacity and A represents the days lost.

b) The person had an accident during the reference period and has not yet returned to work but expects to do so. If the person expects to return to the same job (or is at least physically able to return to the same job, even if he or she does not eventually do so), then A+B represents the expected days lost due to temporary incapacity. However, if as a result of his or her physical incapacity the person does not expect to return to the same job, then the case counts as a permanent incapacity, and the days lost are not used in the analysis of days lost through temporary incapacity.

c) The person had an accident during the reference period, has not yet returned to work and does not expect to be able to do so because of the nature of the injury received. This counts as a permanent incapacity. Although the days lost can be recorded, they are not used in the analysis of days lost through temporary incapacity.

Figure 5.3
Treatment of days lost



0	Time of accident
X	Time of death
Z	Time of return to work
A	Elapsed time between accident and date of return to work (or the date of interview if the person has not gone back to work)
B	Elapsed time between interview and expected return to work

d) The person had an accident during the reference period, has not yet returned to work, but expects to return to the same job (or at least will be physically able to do so, even if he or she does not) in the future. However, the combined expected days lost (A+B) is greater than 365. The case therefore counts as a permanent incapacity, and the days lost are not used in the analysis of days lost through temporary incapacity.

e) This is a special situation which might arise with b), c) or d). These are cases which have been recorded as temporary or permanent incapacity, but if the person then dies within 12 months of the accident from accident-related causes, it should really have been counted as a case of fatal occupational injury. If the survey is done on an annual basis, the case of fatal injury will be picked up in the next survey, after it has already been counted as a case of non-fatal injury this time. In theory the case of non-fatal injury needs to be reclassified as a case of fatal injury, but in practice this is not easy to do, since it will already have been counted as a case of non-fatal injury a year earlier.

f) This and g) represent situations where the person had an accident not in the reference period, but in the previous year. Information is therefore not being collected directly for these two groups. In this particular case the person went back to work within 12 months. The days lost in this calendar year are represented by B. This group is in effect being estimated by the amount B in example b) above, for those cases where the person has (or could have) returned to the same job.

g) This situation is similar to f), except that in this case the person has been absent from work for over 12 months, and the injury definitely counts as a permanent incapacity. The number of days lost this year, represented by B, has in effect been estimated by the B in example d) above, but since the total period is more than 365 days, it does not count for analytical purposes as days lost through temporary incapacity.

Type of injury: Information on the type of injury and part of body injured is basic for understanding the consequences of an occupational accident. It is the injury that was incurred at the time of the accident that should be recorded, not any subsequent conditions that may have developed. If several injuries were incurred in a single occupational accident, it is the most serious injury that should be recorded, in terms of resulting incapacity. The 16th ICLS recommended using the classification shown in box 5.1 for type of injury. More detailed codes could be used, as shown in the 16th ICLS resolution in Annex 1.

Part of body injured: This refers to the part of body that incurred the injury mentioned above. If more than one injury was incurred, it is the part of body receiving the most serious injury that should be recorded. If several injuries were incurred in a single occupational accident and it is not possible to distinguish the most serious among them (as in the case of "multiple injuries" – see above) and these injuries were received on different parts of the body, then "multiple sites" should be the code used. An example of this would be a case of occupational injury where bones were broken in both a hand and a foot. The classification scheme recommended by the 16th ICLS is outlined in box 5.2 on page 50. Classification at a more detailed level may be possible, as shown in the full classification scheme given in the 16th ICLS resolution in Annex 1.

Box 5.1 Classification by type of injury

1. **Superficial injury:**
   Includes abrasions, blisters, bruises, puncture wounds, insect bites, cuts and lacerations.
2. **Fracture**
3. **Dislocation, sprain, strain**
4. **Amputation**
5. **Concussion, internal injury:**
   Includes blast injuries, bruises, concussion, crushing, lacerations and punctures, ruptures and tears of internal organs.
6. **Burn, corrosion, scald, frostbite:**
   Includes burns from electricity and electrical appliances, flames, friction, hot air and hot gases, hot objects, lightning, radiation, chemical burns, scalds and frostbite.
7. **Acute poisoning or infection:**
   Includes acute effects of the injection, ingestion or absorption or inhalation of toxic, corrosive or caustic substances, intestinal infectious diseases and viral diseases.
8. **Other injury:**
   Where the type of injury received does not fit clearly into one of the first seven codes, use code 8 and specify the type of injury. Examples include injuries resulting from the effects of radiation or heat or light, hypothermia, effects of air pressure and water pressure, asphyxiation, effects of maltreatment, effects of lightning, drowning and non-fatal submersion, effects of noise and vibration and effects of electric current.
9. **Multiple injuries:**
   This code should only be used where it is impossible to determine which of several injuries incurred is the most severe.
10. **Not known:**
    This should only be used where it is impossible to obtain information about the type of injury incurred, for example in the case of a proxy interview, or where the establishment records are unclear or absent.

Box 5.2 Classification by part of body injured

1. **Head:**
   Includes skull, brain, ears, eyes, teeth and other parts of the head.
2. **Neck:**
   Includes the spine and vertebrae in the neck.
3. **Back:**
   Includes the spine and vertebrae in the back.
4. **Trunk or internal organs:**
   Includes rib cage, shoulder blade, internal organs, pelvis, abdomen, genitals and the trunk itself.
5. **Upper extremities:**
   Includes shoulder, shoulder joint, arm, elbow, wrist, hand, thumb and other fingers.
6. **Lower extremities:**
   Includes hip, hip joint, leg, knee, ankle, foot and toe.
7. **Whole body or multiple sites:**
   This code is to be used if several different parts of the body were injured in the accident and no one body part was more seriously injured than the others.
8. **Not known:**
   This code should not be used unless it is impossible to obtain information about the part of body injured, for example if proxy information is being given and the respondent does not know the exact part of body injured, or if the establishment records are unclear or missing.

Information about the accident and its sequence

Type of location: When collecting data on occupational injuries, it is helpful to know something about the physical location where the person was when the accident happened. Beyond recommending this as a variable for data collection, the 16th ICLS did not propose a classification scheme. For analytical purposes, the categories shown in box 5.3 could be useful.

Date and time: These refer to the date and time of day when the accident occurred. Analysis of cases of injury by date may reveal seasonal trends in occupational accidents or trends according to the days of the week on which accidents occurred. The time of day may also be an important factor contributing to occupational accidents. The 16th ICLS did not propose any particular coding for these elements, but it is recommended that data be collected in a way which is compatible with that used for the recording and notification of occupational injuries in the country.

Box 5.3 Classification of type of location

1. **In the usual work area in the establishment/unit:**
   This code should be used to describe the case where a person's accident at work occurs in the specific part of the establishment where the person normally works. For agricultural workers, the farm or holding is their usual work area.
2. **Somewhere else in the establishment/unit:**
   This code applies when a person has had an accident at work, but in some location inside the premises of the establishment other than his or her normal work area.
3. **In the usual work area away from the establishment/unit or in no fixed work area:**
   This code is used for people such as lorry drivers, taxi drivers, construction workers or travelling salespersons, whose regular work place may be away from the premises of their establishment. The code should also be used for street vendors, shoe-shiners, etc.
4. **On work-related travel:**
   Some people who do have a regular place of work may have to travel to some other place as part of their work. If they have an accident during this time, and sustain an injury involving lost days, that will count as an occupational injury, and this code should be used.
5. **Somewhere else:**
   This code is only to be used where the location of injury (although stated) cannot be put into any of the four codes shown above. Where this code is used, it will also be necessary to describe briefly the nature of the location where the accident took place.
6. **Not known:**
   This code is only to be used in cases where it proves impossible to get an idea of where the accident took place. Where information about the accident is obtained directly from the person who had the accident, it should be possible to get the required information and use one of the five codes above. But in the case of a proxy interview, the person being interviewed may not know the location of the accident, or the information in establishment records may be unclear or absent. In these cases, this code should be used.

Mode of injury: This refers to how the person was injured by a physical contact with an item or object that caused the injury, or how the person was psychologically affected by an event. If there were several injuries, the mode of the most serious injury should be recorded. The 16th ICLS did not propose any particular classification scheme for mode of injury. In the ILO project, the coding scheme used in box 5.4 was used, based on that used in the European Statistics on Accidents at Work (ESAW) project in the European Union.[14] Codes 01 to 04 relate to actions causing injury that involve non-mechanical elements. Codes 05 to 09 involve mechanical elements. Code 10 covers an action involving an over-

[14] For more information, see http://ec.europa.eu/employment_social/publications/2002/ke4202569_en.pdf.

Box 5.4 Classification of mode of injury

1. **Contact with electric voltage:** The person came into contact with electricity and received an electric shock or burn.
2. **Contact with temperature extreme:** The person experienced extreme heat (e.g. from something burning) or extreme cold (which causes frostbite). The person may have suffered injury even without touching the object.
3. **Contact with hazardous substance:** The cause of the injury was some chemical or biological substance. The person may have inhaled the substance through the nose or mouth, may have digested it through eating or drinking, or an eye or the skin may have been in contact with it.
4. **Drowning, buried:** The injured person was prevented from taking in oxygen resulting in imminent suffocation.
5. **Fell or crashed into something:** The person was in motion (horizontally or vertically) while the object causing the injury was stationary.
6. **Struck by something:** The object causing the injury was in motion, but the person was stationary. The object may have been flying through the air, falling from a great height or running or rolling on the ground. Or it may have been a spring in tension or swinging like a pendulum because it was suspended.
7. **Collided with something:** Both the person and the object causing the injury were in motion. They may have been moving in opposite directions or even in the same direction, at the time of the accident.
8. **Came into contact with sharp/pointed/rough/coarse element:** There was no other clear reason for the injury except for the fact that the object was sharp, pointed, rough or coarse. Injuries that were primarily the result of the fact that an object or the person was in motion are covered under the groups given above.
9. **Trapped, crushed:** The driving force (size/weight/pressure/speed) of an object or machine was the cause of the injury. The victim was either caught in or squeezed by something movable or else was squashed under something or crushed between two objects.
10. **Suffered acute overloading of body:** This refers to cases of severe over loading of muscles, joints and organs/tissues due to excessive turning movements, lifting, pushing, physical agents (noise, radiation, friction, etc.) or trauma in accidental events.
11. **Received kick, bite:** The injury was caused by a human, animal or insect. The person was bitten, kicked, hit, etc. by a human being or animal, or stung by a poisonous insect or fish.
12. **Other reason:** The action which caused the injury is not covered in one of the groups above. In this case, the respondent should provide a description of the way the injury was incurred.
13. **Not known:** No information is available about how the injury was incurred. This should only be used if it is really impossible to obtain information, for example from a proxy respondent.

loading of the body physically or mentally. Code 11 refers to a situation where the injury was caused by an animal or another human being. Code 12 is used for all accidents where the mode of injury cannot be assigned to one of the codes 01 to 11.

Material agency of injury: Here, the aim is to find out the item, agent, object or product that was associated with the injury. This is the physical tool, object, or element with which the victim came into contact, and by which he or she was injured. If the person received several injuries, the material agent associated with the most serious injury should be recorded. The 16th ICLS did not propose a particular classification scheme; the one shown in box 5.5 on page 54 was used in the ILO project, based on that used in the ESAW project.[15] Code 01 is used mainly for accidents where the person fell or bumped into something. Codes 02 to 06 are for accidents where the injuries were caused by devices or where the device malfunctioned. Codes 07 to 09 are for accidents where the person came into contact with, or was crushed or buried under, materials, chemicals, objects, animals, etc. Code 10 is for accidents where the agent cannot be clearly coded under one of the codes 01 to 09 and Code 11 is for accidents where no agent was involved.

Shift, start time of work, hours worked when accident occurred: These three pieces of information are all useful in understanding how accidents occur. They should be coded in a way that is compatible with the coding schemes used for the recording and notification of occupational accidents in the country.

Number of workers injured in accident: This refers to the total number of workers who were injured in one occupational accident, giving some indication of the overall gravity of the accident. If the information is being provided by the person injured, he or she should not forget to include himself or herself in this total.

For the following variables, which are described in chapter 3, the 16th ICLS did not propose classification schemes. To illustrate the types of classification that could be used, Annex 4 reproduces classification schemes for similar concepts that have been developed for the ESAW project.[16]

Place of occurrence

Work process

Specific activity

Material agency associated with specific activity

Deviation resulting in the accident

Material agency associated with deviation

[15] For more information, see http://ec.europa.eu/employment_social/publications/2002/ke4202569_en.pdf.
[16] For more information, see http://ec.europa.eu/employment_social/publications/2002/ke4202569_en.pdf.

Box 5.5 Classification of material agency or injury

1. **Buildings, structures:** All types of buildings, scaffolding, other structures. Also includes stepladders, harnesses, drilling platforms, excavation trenches, roads, pavements, bridges, the ground.
2. **Prime movers (engines, etc.):** Includes all types of engines, motors, electrical transformers, generators and power transmission systems.
3. **Distribution systems:** Stationary or movable pipes for distributing gas, liquids, solid matter and drains and sewers.
4. **Hand tools:** Tools (motorized or non-motorized) which are hand-held or hand-guided.
5. **Machines, equipment:** All types of machine or equipment, including machine tools. They may be portable, mobile or stationary.
6. **Conveying/transport/packaging equipment, or vehicles:** All means of conveying, transportation and stockpiling. Examples are conveyer belts, lifts, cranes, forklift trucks, storage tanks and vehicles of every sort (cars, lorries, boats, aeroplanes, hovercraft, etc.).
7. **Materials, objects:** All materials or objects or parts of a machine. Examples are a car tyre, screws and bolts, a load suspended on a hoisting device, a crate of raw materials and a bale of hay.
8. **Chemical substances:** The chemical substance may be solid, liquid or gas. It may be caustic, corrosive, harmful, toxic, flammable, explosive, vaporous, radioactive or biological.
9. **Humans, animals, plants, etc.:** Includes also trees, insects, snakes and micro-organisms.
10. **Other:** Any other agent which does not fit into one of the above groups. Examples might be a natural disaster (such as a flood, earthquake or tidal wave), or some natural element such as snow, ice or mud.
11. **None:** Injuries where there is no agent involved.
12. **Not known:** This code should only be used where it is impossible to obtain information about the agent or object causing the injury, for example, from a proxy respondent or from an establishment with unclear or missing records.

There are two other items on which it is useful to collect information through household surveys or establishment surveys, if the survey constraints permit. These are: whether the relevant statutory authorities were notified about the injury and also whether the person received any compensation as a result of an injury.

Whether authorities notified: Health and safety regulations or laws generally require some, if not all, employers to notify the government agency responsible for occupational safety and health that a worker has been injured in an occupational accident. In those cases where some statistics on occupational injury are

already available from that government agency, the inclusion of this question in a survey of households or of establishments may help analysts compare the number of cases of occupational injury reported in the different data collection systems. This may be useful in estimating the level of under-reporting of such injuries, or the coverage of the notification system.

Whether received compensation: In some cases where people are injured at work, they may be entitled to compensation, from some kind of accident compensation scheme or from a social security scheme. It is obviously useful to have information about such compensation, since it may well have an effect on the level of reporting of occupational injury and on the length of time that the person is absent from work. For some groups of workers, such as the self-employed, there may not be a system of accident compensation, so there is less incentive to report an occupational injury to the relevant authorities, and less possibility of taking days off work after an accident.

Indicators 6

The structure and distribution of employment by sex, age, status in employment, occupation, economic activity (industry), etc. vary both between countries and over time. The 16th ICLS recognized that it would be necessary to allow for these differences if the data on occupational injuries among the different groups of the working population are to be analysed in a meaningful way. To do so, the data have to be brought to the same base, relating them to a reference population. Comparative measures, or indicators, may thus be constructed for many of the variables on which information is collected.

This chapter first covers the denominators and the data needed for constructing indicators, then outlines the issues involved in the calculation of the four main indicators recommended by the 16th ICLS.

Denominators

Before considering various indicators of occupational injury, there are two data items in addition to those covered in chapter 5 that require special attention, because they form the basis for the calculation of these indicators: a) number of workers and b) hours worked. This section discusses issues involved in their measurement, and then provides guidance on their calculation.

Number of workers

In collecting and presenting data on occupational injuries, it is essential to specify clearly the reference group to which the data apply. The term "workers in the reference group" means those workers in the particular group under consideration and covered by the source of the statistics of occupational injuries (for example those of a specific sex or in a specific institutional sector, branch of economic activity (industry), occupation, region, age group, or any combination of these, or those covered by a particular insurance scheme). Thus statistical information collected on occupational injuries as referred to in the previous section should relate to the same reference group. Ideally the statistics should cover the whole country, all branches of economic activity (industry) and all sectors of the economy, as noted in chapter 4. If the data relate to different reference groups, some adjustments to the data will need to be made before any indicators can be calculated. For instance, it would not be meaningful to calculate a severity rate for occupational injuries directly from a set of data where the number of cases of occupational injury relates to all workers in a country, but the hours worked relate only to a subgroup of the population. The two data items must first be put on the same basis, so that they apply to the same group of people and the same area of the country, before any meaningful rates can be calculated.

In terms of *periodicity* of reporting, the 16th ICLS recommended that the statistics should be compiled at least once a year for a reference period of not more than a year.

Since there is often a need at the analysis stage to relate occupational injuries to the occupation and economic activity (industry) codes, and hours worked, in each job, it is often necessary to think in terms of jobs rather than workers.

According to the 16th ICLS resolution, the number of workers in the reference group "should be the average for the reference period". Care needs to be taken in calculating the average, since it clearly is not appropriate to use the estimate of all those who have been economically active at some time during the year as the measure of the number of workers. This would grossly overestimate the true "usual" number of workers. Similarly, it would be wrong to calculate the number of workers on the basis of the usually employed population, since there are always likely to be some members of the usually unemployed and the usually inactive population who are active at some time in the year. A better method would be to use the currently employed population as the estimate of the number of workers, but this approach may suffer if there is much seasonal variation in employment. Since the 16th ICLS recommends counting cases of occupational injury over a 12-month period, the average number of workers can best be obtained by taking the average of several discrete points over the year. An example of this approach, using quarterly labour force survey (LFS) data, is given in chapter 7.

More problematically, the resolution recommends that "in calculating the average, account should be taken of the hours normally worked by those persons. The number of those working part time should be converted to full-time equivalents." The resolution does not give any guidance on how this should be done. Notwithstanding the advice given, it may be preferable not to use full-time equivalents in calculating the number of workers, since it introduces many additional problems. As will be seen later, if all workers worked a standard 40-hour week for 50 weeks a year, the value of the incidence rate would come out to exactly twice the value of the frequency rate. The extent to which this relationship does not hold will be a reflection on the extent to which the average hours of work differs from 40 hours. This will be partly due to differences between countries in the length of the standard working week, but will also be partly a reflection of the balance between full-time and part-time working.

Number of hours worked

According to the 16th ICLS resolution, hours worked should refer to the "number of hours actually worked by workers in the reference group". "Hours actually worked" includes time spent at the workplace on productive activities and on other activities which are part of the tasks and duties of the jobs concerned (for example, cleaning and preparing working tools).[1] It also includes time spent at the place of work when the person is inactive for reasons linked to the production process or work organization (for example, standby time), because during these periods paid workers remain at the disposal of their employer. "Hours actually worked" also includes short rest periods spent at the place of work because they are difficult to distinguish separately, even if workers are not "at the disposal" of their employer during these periods. Lunch breaks are explicitly excluded, since they are normally sufficiently long to be easily distinguished from work periods.

If it is not possible to calculate the "hours actually worked" by workers in the reference group, the 16th ICLS recommended that "normal hours of work" should be used, taking into account entitlements to periods of absence from work, such as paid vacations, paid sick leave and public holidays.

While hours of work are often reported in terms of a weekly average, an annual average is required for the calculation of the various occupational injury indicators.

[1] See the *Resolution concerning statistics of hours of work*, adopted by the 10th ICLS in 1962, at http://www.ilo.org/public/english/bureau/stat/download/res/hours.pdf.

Calculation of indicators

The 16th ICLS resolution proposes four measures for comparing information on occupational injuries at the national and international levels. These four indicators are: frequency rate, incidence rate, severity rate and average days lost.

Frequency rate:

$$\frac{\text{Number of new cases of occupational injury during the reference period}}{\text{Total number of hours worked by workers in the reference group during the reference period}} \times 1{,}000{,}000$$

The frequency rate relates the number of injuries to the number of hours worked by workers in the reference group. This is probably the most useful rate to calculate, because the hours worked represent a direct measure of the degree of exposure of the workers to the risk of injury. The frequency rate is calculated per one million hours worked, and separate rates may be calculated for fatal and non-fatal injuries.

Incidence rate:

$$\frac{\text{Number of new cases of occupational injury during the reference period}}{\text{Total number of workers in the reference group during the reference period}} \times 1{,}000$$

Severity rate:

$$\frac{\text{Number of days lost as a result of new cases of occupational injury during the reference period}}{\text{Total number of hours worked by workers in the reference group during the reference period}} \times 1{,}000{,}000$$

Average days lost:

Median or mean number of days lost for each new case of injury during the reference period

These four comparative measures can be summarized as follows:

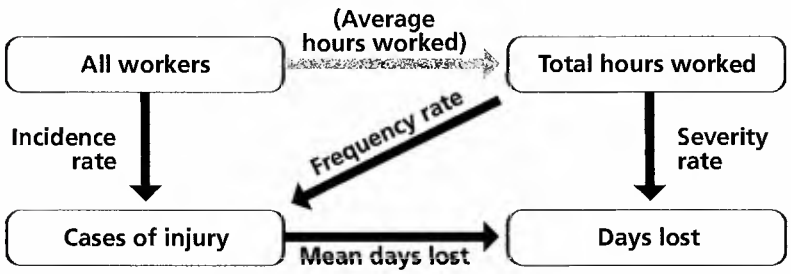
Measure	Numerator (ignoring millions and thousands)	Denominator
Frequency rate	Cases of injury	Hours worked
Incidence rate	Cases of injury	Workers
Severity rate	Days lost	Hours worked
Average days lost	Days lost	Cases of injury

The four measures are thus very closely linked. Only two specific items of occupational injury data (cases of injury and days lost) are involved in these comparative measures. The other two data items (number of workers and hours worked) are already often collected from regular household or establishment surveys.

Conceptual framework for linking the indicators

Using a simplified format, the relationship between the comparative measures and these four variables are illustrated in figure 6.1. The indicator average hours worked is also shown in the diagram, since this information is often available. It should be noted, however, that the average hours reported here must refer to the hours worked over a whole year, not the average weekly hours, since the three rates (incidence, frequency and severity) are all based on annual data.

Figure 6.1
Simplified representation of the relationship between the four comparative measures of occupational injury



The direction of the arrows in this diagram is important: the head of the arrow indicates the numerator and the tail indicates the denominator. The diagram is useful in that it illustrates the very close interrelationship between the comparative measures. It is sometimes possible to get from one box to another by two or more routes.

Thus, ignoring the millions, the severity rate can be calculated directly by dividing **days lost** by hours worked.

- **Direct calculation: severity rate = days lost/hours worked**

Alternatively, it could be calculated indirectly via the *injuries* box. In this case, since the arrows pass in the same direction, the severity rate would be calculated as the **frequency rate** multiplied by the **mean days lost**:

- **Indirect calculation: severity rate = frequency rate x mean days lost**

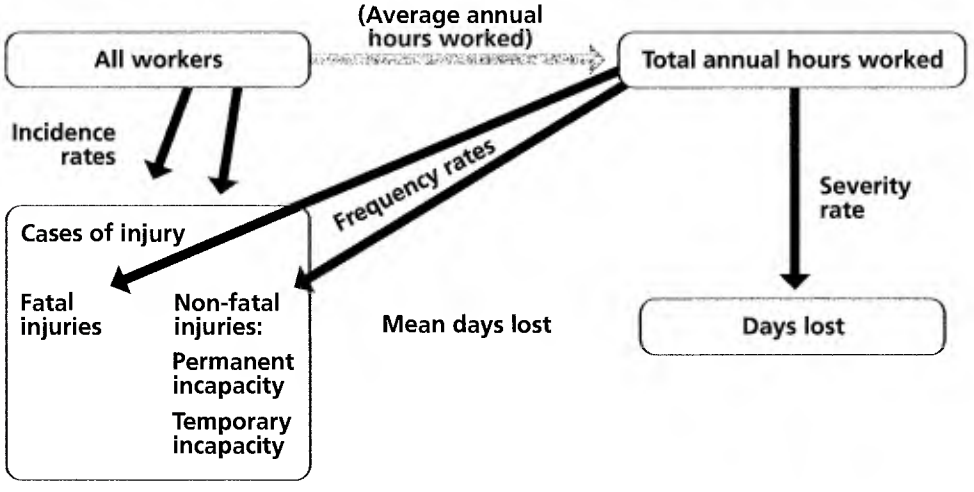
From the formula above we can see that if the **severity rate** and the **mean days lost** were already known, we could calculate the **frequency rate** as:

- **Indirect calculation: frequency rate = severity rate/mean days lost**

Here, **mean days lost** is the denominator, as can be seen by the direction of the arrows. To reach *injuries* from *hours worked* (i.e. the **frequency rate**), the arrow from hours worked to days lost (**severity rate**) is followed, but then it is necessary to go backwards along the arrow from days lost to injuries (**mean days lost**).

Figure 6.2 gives a truer picture of the relationships between the comparative measures, since account needs to be taken of whether the cases of injury are fatal or non-fatal, and also whether (in the case of non-fatal injuries) the injuries cause temporary or permanent incapacity. Incidence rates and frequency rates should be calculated separately for fatal and non-fatal injuries, while evidently mean days lost should be calculated only in respect of cases of non-fatal injury with temporary incapacity for work.

Figure 6.2
More detailed relationship between measures of occupational injury



Adapting the framework to reality

There is often a fairly direct relationship between incidence rates and frequency rates. This is because they are linked through average hours of work. The 16th ICLS resolution recommended that incidence rates should be calculated per 1,000 workers, and that frequency rates be quoted per one million hours worked. However, in a country where all workers work an average of 40 hours a week for 50 weeks a year, 500 workers would work a million hours in a year, and 1,000 workers would work 2 million hours in a year. In this situation the incidence rate would work out as exactly twice the value of the frequency rate. This is probably the reason why in some countries incidence rates are calculated per 500 workers rather than per 1,000 workers.[2]

One final issue arises in calculating the rates in connection with advice given in the resolution about the base figure to use for incidence rates. The resolution recommends that the number of workers in the reference group should be the average for the reference period and that, in calculating the average, account should be taken of the hours normally worked by those persons. It suggests that the number of those working part-time should be converted to full-time equivalents. If this advice is followed, then the average hours must also be calculated on a similar basis, so as to maintain consistency in the data.[3]

[2] The United States appears to adopt a rather different approach. There, the incidence rate is defined as *(number of injuries and illness x 200,000)* / employee hours worked. The 200,000 in the formula represents the equivalent of 100 employees working 40 hours per week, 50 weeks per year. More details of the method used are available on the web site of the US Bureau of Labor Statistics (www.bls.gov).

[3] The disadvantage of this approach is that the figures for average hours of work will no longer reflect the differences between sectors in the proportion of part-time working, but will reflect only variations in the number of hours worked full time.

Factors affecting choice of data collection approach 7

Notification systems and/or surveys

Before deciding to conduct a survey to collect data on occupational injuries, the existing arrangements for compiling these data should be examined. In particular, it is necessary to check whether there is an administrative system for the notification of occupational injuries which is used for compiling statistics on this topic. As discussed in the introduction, in many cases the coverage and level of reporting of such notification schemes are unsatisfactory. Although some countries may have better coverage and levels of reporting, no country actually manages to have a "perfect" notification system. While it is recommended that notification schemes be improved,[1] this can take a long time, because changes are generally generated by changes in laws or regulations, which in turn take time to be developed and adopted. In the meantime it may be desirable to mount a survey of some kind, in order to get comprehensive national estimates of occupational injuries.

Once a decision is made that a survey will be carried out, the next question is whether the data should be collected through an ***establishment survey*** or a ***household survey***, or even through both methods. An ***establishment survey*** is a survey of the units that employ workers, and may also be known as a survey of employers or of enterprises. It is usually carried out using sampling methods, often covering all large establishments (for example with 100 or more workers) and a sample of smaller establishments, with a minimum cut-off point for small establishments (for example fewer than ten workers). The survey establishments are usually selected from a business register or directory, or a register of enterprises or establishments, which is maintained by a central body such as the national statistical office or the organization with which businesses must register. Regular establishment surveys are most often economic surveys, collecting data on production, costs, inputs, etc., including employment and hours worked, or surveys of employment and earnings. A ***household survey*** is, as the name suggests, a survey where the household is the source of information. It is usually a sample survey, where the household is the sampling unit, and where information is collected about the household and its members. Regular household surveys

[1] Annex 6 provides information on the international recommendations in this respect, and gives examples of notification forms in selected countries.

are most often surveys of the labour force, while there are also periodic surveys of household income and expenditure, health, education and other characteristics of household members.

Whichever type of survey is decided on, it is recommended that a technical advisory group be established at the planning stage, to provide support and advice during the design of the survey, the selection of data items to be covered, the method of data collection, the types of data required for analysis and so on. This group would comprise officials from the statistical office and the labour ministry, as well as representatives of workers and employers, and of interested groups, such as safety and health organizations, women's groups and agencies set up to combat child labour. It is important that all parties with an interest in statistics on occupational injuries be involved, in order to ensure that, as far as possible, all concerns are taken into account. They can also provide useful insights about types of data, types of occupational accidents and injuries, and ways of obtaining data. They can also play a useful role in publicizing the survey and obtaining cooperation from households and establishments.

By closely involving the labour ministry and organizations of workers and of employers in the design of the survey and in the data collection, as well as in the analysis of the results, it is probable that these bodies will become much more aware of the issues involved in workers' safety, and be in a better position to take action to improve the situation. Involving organizations of workers and of employers would also have a beneficial impact on the quality of data and the level of response, since they would be in a better position to inform their members about the survey and encourage collaboration. Involvement will also lead to the labour ministry and organizations of workers and employers feeling they have some ownership of the results, rather than simply being receivers of data.

If the national statistical office or the labour ministry already conducts a regular establishment or household survey, this may be considered a good vehicle to use. Questions about occupational injuries could then be put in a module, as an add-on, rider or trailer, attached to the main survey questionnaire.

Where there is a choice between the two types of survey, a household survey would be preferable, because the survey generally covers the whole population throughout the country, and consequently all branches of economic activity and sectors and all groups of the working population. An establishment survey often does not cover certain sectors of the economy, such as public services or agriculture. In addition, those who are self-employed or working in the informal sector are unlikely to be covered in an establishment survey. Usually the sampling frame used for selecting establishments has a lower cut-off point in terms of size of establishment, so that small establishments are automatically excluded. Finally, it is often difficult to maintain an up-to-date register of establishments, so the available sampling frame may be out-of-date, particularly regarding

smaller establishments. For all these reasons, a household survey will generally be preferred to an establishment survey.

While a household survey may be the preferred instrument for collecting comprehensive data on occupational injuries, establishment surveys have a number of advantages. Establishments can relatively easily be identified by branch of economic activity and by geographic location, which facilitates the collection of data by industry and region. Many establishments are required by laws or regulations to keep records of occupational accidents and occupational injuries incurred by their employees, in addition to records of employment and hours of work, among other details. These records are therefore useful for providing fairly reliable information on occupational injuries and employment, although the records of smaller establishments may not be accurate or complete. Other important advantages of establishment surveys are that their cost is relatively lower than that of household surveys, and they are easier to administer than household surveys. An establishment survey has other practical merits. It may involve close collaboration between the statistics office and the labour ministry, which then has beneficial effects on collaboration between the two agencies in other areas of statistics. However, one disadvantage of establishment surveys is that they can only cover employees.

Another important consideration when deciding on the type of survey to be used is the ability of the national statistical office (or other designated agency) to carry out a major survey. Financial and managerial issues play a major part in the success or failure of surveys, and the importance of these issues was highlighted in the three countries where pilot surveys on occupational injuries were conducted.

In the case of these pilot surveys, all three national statistical offices experienced very tight financial constraints, which had an impact on their ability to achieve the desired survey coverage and data quality. Managerial functions are obviously the responsibility of the national statistics office, and it must make every effort to manage survey resources in an efficient and transparent fashion. Where resources are severely limited, the country should limit its survey activities accordingly, and not be too ambitious in its data collection.

Surveys as a benchmark for coverage

For countries that do have data on occupational injuries from notification systems, conducting an occupational injury survey would provide a very useful benchmark, to help in assessing how complete the administrative records are. Such surveys need not necessarily be national in scope, or cover all areas of economic activity. For instance, if there was concern about the apparent levels of occupational injury in a particular sector or area (for example, hotels and restaurants in one part of the country), it might be worthwhile to carry out an establishment survey in that part of the country, but limited just to that sector and area. Besides shedding light on the completeness of the coverage of the administrative records, detailed analysis of the survey data might indicate the extent to which the administrative records are currently providing differential coverage of various groups of interest. This might help to suggest ways in which the coverage of the administrative records could be improved.

"Heavy" or "light" surveys

If a decision is made to collect data through a survey, either of establishments or of households, the next decision concerns the type of survey that should be carried out. One approach, if resources permit, would be to carry out a full-scale stand-alone survey, concentrating on collecting all the data items and variables outlined in chapter 5. This type of "heavy" survey would provide valuable baseline data, but would be extremely costly. Further suggestions for such surveys are given in later chapters.

Where resources are limited or a country already has a well-established labour force household survey or establishment survey of employment and earnings, for example, the best option may well be a "light" survey. In this case, a few questions are inserted in the survey questionnaire, or a short module of special questions is added to it. Where this is done, the number of questions asked should be limited to the bare essentials, so as not to overload the main survey.

Availability of data on number of workers and hours worked

Before deciding on an appropriate course of action, it is advisable to review the current availability of data and information systems, in order to see whether some of the information available may be of use in the calculation of the indicators described in chapter 6. In particular, some national information is likely to be available on the number of workers or the number of jobs in the country, and this information may be adequate to provide the denominator in the calculation of incidence rates. Similarly, national information already available on hours of work may be adequate to provide the denominators in the calculation of frequency rates and severity rates. The numerators for these three indicators would be drawn from the data system or survey set up to collect information on occupational injuries.

Ideally this information on workers or jobs, and on hours of work, should be representative of a whole year, rather than describing the situation at a particular point in time. If the information is only available from a national population census or from a one-off LFS, it is likely to reflect only the current economic activity. This will provide a reasonable approximation in situations where most people have only one job, and where employment patterns remain fairly stable throughout the year. But in situations where part-time working in second jobs is common or where employment is highly seasonal (as would be the case in many developing countries), a population census or one-off survey is unlikely to provide a realistic picture of total employment throughout the year.

The distinction between workers and jobs has already been mentioned in earlier chapters: one worker may in fact have two or more jobs in the course of a year, or even simultaneously. In practice the distinction between persons and jobs may not always be easy to apply. Much will depend on the form of the available statistics. What is required is to obtain the best possible estimate of the average number of workers (jobs) throughout the year. In some countries this figure may vary quite substantially at different times of the year because of seasonal factors, especially in sectors such as agriculture or tourism.

Where a country has carried out a single LFS, care must be taken to assess the value of the estimates produced from it. If information has been collected only about current economic activity (e.g. during the last week), such estimates may not provide a good indicator of employment over the whole year, and the occupational injury survey will itself need to provide these estimates.

On the other hand, if an attempt has been made to estimate usual economic activity in the labour force survey, then it is probable that detailed information will be available from the survey about each person's economic activity throughout the year. From this data it should be possible to get the required estimates of average employment throughout the year in different branches of economic activity and of the time spent in those economic activities.

Some countries conduct LFS at regular intervals, such as every quarter. Even if these surveys only collect information on current economic activity, it will be possible to get reasonably good annual estimates by averaging across the four quarters. This issue is discussed in more detail in the next section. Ideally such surveys should collect information about all economic activities carried out in the short reference period. Where questions are asked only about the principal activity, this poses problems for estimation, because of the absence of information about secondary and other jobs. In such situations it may be necessary not to use the LFS, but to rely on information collected in the occupational injuries survey itself for the estimates.

Household surveys are rarely able to measure accurately the hours actually worked by the population for a long reference period, such as a year. Accordingly, a different approach is suggested for household surveys. Respondents are asked to indicate how many weeks they have worked in each job during the past 12 months, and are then asked to estimate the usual hours of work per week in each job. These two figures can then be multiplied together for each job to provide an annual estimate, though it should be noted that this makes no allowance for annual leave or public holidays. In obtaining usual hours, efforts should be made to obtain estimates of the average hours actually worked, rather than the normal or contracted hours of work.

The great advantage of the survey approach to collecting data on occupational injuries is that the same source may provide both the numerators and the denominators for the calculation of injury rates. It is not necessary to look elsewhere. One limitation of the establishment survey approach is that it only provides information about occupational injuries occurring to those who are employed in establishments that appear on the business register used for drawing the sample. Typically large sections of the working population will be excluded, since they do not work in formal establishments above the size that is used as the cut-off point for the selection of establishments (say establishments with ten or more workers). This means that, while it is possible to calculate incidence rates for various occupational groups, the rates obtained apply only to those working in establishments that fall within the sampling frame. The rates do not apply to similar workers who may be working independently or in smaller establishments.

What to do if detailed jobs data cannot be collected

Theoretically, there should be no problem in collecting, as part of a survey on occupational injuries, the jobs information that is required for estimating comparative measures. Occasionally, however, it might be necessary to resort to a fall-back position if this proves impossible.

Obviously, data on occupational injuries and on days lost have to be collected on an individual basis for each case of injury in the occupational injuries survey. However, data for the two other key items (number of workers and number of hours worked) are only required at the population level, with of course the necessary breakdowns by sex, age, occupation, economic activity, etc. This information may already be available from labour force or other surveys carried out in a country, and the information does not then have to be collected through this survey module (though it would be desirable to collect it if at all possible).

Often, however, the LFS or another household survey will provide much of the needed information. It will then only be necessary to collect the information on occupation, economic activity, status in employment, and size of establishment, in respect of each case of occupational injury. These questions would be asked only of people who had received occupational injuries.

For example, if a country carries out a quarterly LFS, and asks for information about current activity, it should be possible to obtain averages for the whole year. In this way, reasonable estimates may be made for the average number of workers in each occupation, economic activity and status in employment, and of the total hours worked in each occupation, economic activity and status in employment, separately for males and females. Similarly, if a country only carries out one LFS each year, but collects information on all jobs done during the year, and hours worked in each job, this should give reasonable estimates. Further information on this matter is given below.

Information on the six background variables (sex, age, occupation, economic activity, status in employment and size of establishment) will of course need to be collected in the survey. Age and sex will be available already from the main survey, but the other four variables need to be related specifically to the time when the injury occurred. Information will have to be collected on the injured person's occupation, branch of economic activity, status in employment and size of the establishment/unit at the workplace at the time of the accident. These useful variables were discussed in detail in chapter 5.

Tables for two of the key variables – number of workers and number of hours worked – are obtained as follows. If the LFS is carried out on a quarterly basis, then tables for all workers can be obtained by preparing tables for each quarter based on information on work done during the short reference period (presum-

ably a week). It is assumed that no information is available from the quarterly LFS on the jobs done over a longer reference period. These individual tables should contain data that has been grossed up to give national estimates. Main and second jobs (and additional jobs if listed) should be treated separately. For instance, a table of employment by age and by sex is prepared for first jobs in the first quarter, and a similar one for second jobs in the first quarter. By aggregating the corresponding cells for first and second jobs in this quarter, we get a table showing the distribution of all jobs in that quarter by age and sex. Similar tables on jobs are produced for the other three quarters in the year, and the average of the four tables gives the average number of jobs throughout the year. It is actually the average of four estimates at four different points in time, each three months apart, but it will give a good estimate of the average number of jobs across the year (see figure 7.1).

Similar tables can be produced for the other variables, such as employment by occupation and branch of economic activity. Again, the tables will need to be set up initially for main jobs and then for second jobs, and then the two tables amalgamated. In addition, the same three tables can be produced, but with filtering on the fifth and sixth background variables. For instance, the three tables can be produced just for employees, or just for those working in establishments with at least ten workers.

Figure 7.1
Annual estimates of employment based on data for main job

JOBS	LFS - 1			LFS - 2			LFS - 3			LFS - 4			LFS - Average		
	M	F	T	M	F	T	M	F	T	M	F	T	Male	Female	Total
Age															
<18															
18–24															
25–49															
50+															
Total															

The tables for hours of work will be obtained in exactly the same way (again grossed up to give estimates for the full population coverage). In this case, however, each record in the grossed-up data file is weighted by the number of hours of work done by that person in the reference period (which is probably the current week). The average of the four values for each corresponding cell will then indicate the average total weekly hours worked by all people in the country. Each cell is then be multiplied by 52 to give an estimate of annual hours worked.

In mathematical terms, this calculation can be described as follows. Suppose the estimate of total current employment each quarter is m_1, m_2, m_3 and m_4, and the estimate of average weekly hours is h_1 , h_2 , h_3 and h_4. The best estimate of current employment (on an annual basis) is then $\Sigma\ m_i/4$, and the best estimate of total annual hours worked is $52 * (\Sigma\ m_i\ h_i/4)$. Average annual hours per worker is therefore $52 * \Sigma\ m_i\ h_i\ /\Sigma\ m_i$. It should be noted that, because of the effects of part-time and seasonal working, the actual number of people who do work some time in the year will be higher, and the average hours worked will be lower, than the estimates shown here. However, this estimate of total hours is the best that can be obtained, without collecting detailed annual employment data for each person in the survey.

Even if the LFS is not conducted on a quarterly basis, it may still be possible to use the data, as long as the questionnaire contains sufficient detail about jobs over the whole year. If it does not provide enough detail, the occupational injury survey module itself must be used to provide the desired information.

Two examples (see box 7.1) help to illustrate how mean hours of work can be calculated from biannual and quarterly LFS.

Box 7.1
The use of LFS data to calculate mean hours of work per year

Example 1

Suppose there are just two seasons in the year, an agricultural season and a non-agricultural season – each lasting six months – and that the LFS is only carried out twice a year. The same arguments would apply if the LFS was quarterly (see second example).

	Non-agricultural season	Agricultural season	Annual average
Number of workers (million)	1	2	3/2 = **1.5**
Average hours per week	40	70	(see below)
Total hours worked (26 weeks)	1040 million	3640 million	4680 million
Mean hours per year per worker			= 4680/1.5 = **3120**

Note: To get the average number of workers over the year, we take the mean of the number of workers in the two periods (i.e. 1.5 million workers). The mean hours per worker works out at 60 hours per work. This is correctly weighted two-thirds of the way between 40 and 70 hours, since it is in relation to the balance of the workers between the two halves of the year.

Example 2

Assuming there is a quarterly LFS in a country, and it collects information on hours currently worked, the information from the four most recent rounds can be used to calculate the average annual number of workers (say by industry), their total hours worked in the year, and thus the average hours of work per week.

	Q1	Q2	Q3	Q4	Annual average
Number of workers (million)	1 m	2 m	3 m	2 m	8/4 = **2 m**
Average hours per week	20	30	60	40	(see below)
Total hours worked (13 weeks)	260 m	780 m	2340 m	1040 m	4420 m
Mean hours per year per worker					= 4420/2 = **2210**

Note: This is equivalent to 42.5 hours per week.

Other issues

Periodicity of data collection

Whereas a notification system provides a continuous flow of data, a survey can only collect information at a particular time and in respect of a particular period. It is possible, however, to carry out surveys at such regular intervals that they provide data that are comparable with those from administrative sources. An example would be an establishment survey carried out annually, which collected information about all employment, hours worked and occupational injuries in the last 12 months.

Attempts could be made to collect similar employment information in a household survey in respect of a full year, but the associated problems of memory recall would make the task difficult and the resulting data would be of doubtful quality. While people can almost certainly recall occupational injuries they have experienced over a 12-month period, particularly if those injuries are at all serious, they may have some difficulty in recalling their spells of employment, particularly if they have switched jobs or had multiple jobs at the same time. They would be even less likely to be able to recall the number of hours worked in each job.

As seen in the last section, a better approach would be to make use of data from a quarterly or monthly LFS, if such a survey has been carried out. The LFS usually collects information on current economic activity, but there would be information about current employment at four or 12 points spread out evenly throughout the year, so this would pick up any seasonality in employment. A more difficult problem is that some of these surveys ask only about the main job in the last seven days, and do not collect information on second or third jobs. Knowledge of local employment patterns will help to indicate whether this omission is a serious drawback to using this data.

In cases where there are no data from existing surveys, all the required information will need to be collected through an occupational injuries survey. Such a survey requires very careful planning, if it is to produce a successful outcome. Key points to be considered are discussed in the chapters that follow.

Choice of reference period

The choice of reference period for the survey is clearly an important issue. As a general rule, it is desirable to collect information in respect of a full 12-month period. From the point of view of data dissemination, as for instance with the

figures published in the *Yearbook of Labour Statistics*, it is preferable for the data to refer to calendar years. Such a practice is probably quite manageable in an establishment survey, especially if the survey is being carried out early in the year. In this case, those completing the survey return should have no difficulty in recalling the necessary data from the previous calendar year, and the information on occupational injuries may well be recorded anyway according to calendar year.

Using the calendar year may be much more problematic in the case of household surveys. It may in fact prove more convenient to collect information in terms of the last 12 months, working backwards from the day of the interview. Attempts must then be made to adjust the data in some way (perhaps using data from different surveys) in order to arrive at calendar-year data. Alternatively, the differences may simply be ignored, and the resulting survey figures taken as being as though they were already calendar-year data.

Choice of reference group

The choice of reference group may not be entirely in the hands of the agency conducting the survey. With establishment surveys, information for the sampling frame may only be available for certain branches of economic activity or for certain parts of the country. For instance, agricultural establishments may be excluded entirely from the sampling frame, or the frame may be limited only to the capital city. Usually firms below a certain size (say ten employees) are not included in the frame. In some cases, the sampling frame may only contain information on enterprises, rather than establishments, which would have a large impact on the sampling by size, geographic region, etc.

Household surveys usually cover a much larger section of the population, though even here, certain parts of the country may be excluded, perhaps because of communication problems or a difficult security situation. It is normal to exclude the institutional population from household surveys. As a result, certain types of workers (such as prison warders, caretakers at schools and hospital staff) risk being omitted from the survey if they live on the premises, as may groups such as mine workers living in dormitories.

If national estimates of occupational injuries are required, efforts should be made to use a sampling frame with as wide coverage as possible, for both establishment surveys and household surveys.

Household surveys 8

This chapter describes the characteristics of household surveys for the collection of data on occupational injuries, giving advice on the special issues involved in measuring this topic. A model questionnaire is provided for stand-alone surveys and for short modules of questions that can be attached to existing household surveys, as well as examples of questions that could be inserted in LFS questionnaires.

Planning the household survey

Coverage

Household surveys are perhaps the best vehicle for obtaining reliable national estimates of occupational injuries. The great advantage of these surveys is that they can be designed to represent all geographical areas of the country, and can collect occupational injury data for all groups within the working population living in households, irrespective of the nature of their economic activities. The surveys thus include hard-to-reach groups such as agricultural workers, the self-employed and those working in the informal sector. The principal disadvantage with household surveys is that, because of the sample size and the relatively low frequency of fatal occupational injuries, they do not necessarily provide good estimates of fatal occupational injuries.

Household surveys for collecting data on occupational injuries should be planned as a joint operation between the national statistics office and the government agency (usually the ministry of labour) responsible for occupational safety. The statistics office brings to the survey knowledge and experience of survey design, data collection and analysis and report writing, while the labour ministry provides an important policy perspective for the data and can help to ensure that the results are widely disseminated and acted upon. Two other groups should be involved in the planning of the survey and the dissemination of the data: representatives of workers and of employers. These are both directly involved in occupational safety at the workplace, and as such have an interest in ensuring that their own needs are taken into account. In addition,

their involvement can help in obtaining the cooperation of respondents, who will include both workers and employers. To the extent possible, other interest groups, such as those working to eliminate child labour or representatives of informal sector workers or of women workers, should also be given the opportunity to give their views.

Sampling

Most national statistical offices have extensive experience in preparing appropriate sample designs for national surveys, but a few points need to be emphasized with respect to household surveys of occupational injuries.

Although the subject here consists of household surveys, the main interest is in fact to obtain a representative sample of individuals. Households are used merely as a convenient means of obtaining that sample. Provided the survey is designed in such a way as to obtain a representative sample of households, and then all eligible persons within those selected households are surveyed, the result will be a representative sample of individuals.

In most countries, the population is so widespread that it is usually necessary to use some sort of area sampling frame, rather than selecting households from a master list for the entire country. For instance, the national statistics office may well maintain a master frame, with the country divided into regions or provinces, and with smaller geographic units within these. Quite often these smaller units are the enumeration areas that were used in the last population census. If no such smaller units exist, they will need to be created. What is required is for the country to be divided up into a large number of small well-defined units, of approximately equal size (say between 50 and 200 households each), and for the statistics office to maintain an up-to-date register of these areas with their associated measures of size (i.e. the estimated number of households in each area).

The traditional way is to select a sample of these areas using probability proportional to size (PPS). The areas are listed in geographical order within each region/province, along with their associated measures of size. A cumulative listing of size is then prepared from the listing, and the required number of areas is selected at systematic intervals throughout the cumulative listing. This method results in each area being given a chance of selection that is directly proportional to its size.

Within each selected area a listing exercise is then carried out, to identify all the households in the area, and a fixed number of households are then selected systematically from this list. Provided there has been no change in the measure of size, all households will have the same probability of selection, since the PPS used at the first stage is exactly counterbalanced by the use of the inverse of PPS

at the second stage. Apart from providing a self-weighting sample (at least in theory), this method of sampling has the great advantage from a fieldwork point of view in that it results in equal-sized quotas for the interviewers. In practice the resulting data probably needs adjusting slightly, to take account of two factors: changes in the measures of size, and any non-response that occurs on the survey.

If the occupational injury data are being collected as an additional module of questions added to the questionnaire of an existing survey, such as a LFS, it is probable that the above-mentioned sample design will have been adopted. Household members who are interviewed for the LFS can also be interviewed in respect of occupational injuries.

One problem with this approach is that the final quota sizes are fairly small – typically no more than 20 households per final sampling unit. Occupational injuries are (fortunately), relatively rare occurrences, and there may be many quotas where there are no injuries to report. This will not matter if the sample of households has already been designed for some other purpose (such as a LFS), but if a stand-alone survey of occupational injuries is being carried out, it may be desirable to find an approach which is more efficient.

If the survey is an add-on module to a regular survey questionnaire, it may be tempting to incorporate a filter during the initial interview with the sample households, aimed at identifying all persons who had been injured in occupational accidents during the reference period, so that only they would be interviewed for the occupational injury module. This approach was tested in the ILO project in one country, but it appeared to lead to a serious undercounting of cases of injury. This may have been due to the small size of the sample, rendering up very few "hits" of cases of occupational injury, or because much of the information had to be collected by proxy. Instead, it would be safer if questions about occupational injuries were directed at each person in each sample household, so that each one has a chance to report any injuries incurred, even if they are minor.

If the occupational injury survey is being carried out as a stand-alone survey, it may be preferable not to use a PPS approach at all. Instead, a random sample of areas could be selected with equal probability, and all households visited, to identify persons who had received occupational injuries during the reference period. It should be noted that, if the plan is to carry out a filter of the entire first stage unit, equal probability sampling rather than PPS should have been used for selecting the unit in the first place. In this way the principle of the sample being self-weighting can be maintained, at least in theory.

Questionnaire design

As described above, it may not be necessary to carry out a stand-alone survey to collect data on occupational injuries. Often, the required additional questions can be attached in a special module to an existing survey. Nonetheless, it is helpful to begin by showing the full model questionnaire for a stand-alone household survey. The essential elements that would be required in a module attached to a LFS or other existing survey could be extracted from this model questionnaire.

The full model questionnaire is shown at the end of this chapter, in the appendix (p. 89). The first page of the questionnaire is used for recording the standard details of household composition: name, sex, age last birthday and relationship to head of household for each household member. As discussed earlier in chapter 5, sex and age are useful variables in their own right. Names and relationships of household members are only required so that the interviewer can be sure of correctly identifying all household members, and to facilitate later questioning of individual members.

The household listing sheet in this model contains space for 15 household members. If the household is larger, an additional listing sheet will be required. Similarly the main part of the questionnaire has space for showing the work and occupational injury experience of five people. If there are more than five eligible members in the household, another questionnaire must be used.

Question 6 is a critical question, since this helps to identify all members of the household who have done any work activity in the last 12 months. Incidentally, this group does not represent only the currently employed (those who have done any work in a short reference period such as the last week), nor does it represent only the usually employed (those who for the greater part of a long reference period, such as a year, had been economically active, and who had been more often employed than unemployed). Instead, it includes all those people who have done any work at all in the last 12 months. It will therefore include many people who would otherwise be counted as currently inactive or usually inactive. Provided they have done some work in the last 12 months, they are at risk of having sustained an occupational injury and information about their work experience is needed.

A broad concept of "work" should be used in question 6, in line with the definition of economic activity covered by the 1993 System of National Accounts (SNA).[1] It thus includes not just formal sector employment, but all manner of work activities, paid or unpaid.

[1] For information, see http://unstats.un.org/unsd/nationalaccount/nadefault.htm.

Question 7 is used to identify those who are eligible for the survey. Eligibility will be determined on the basis of positive responses on two factors: whether the person is above a certain age, and whether he or she has done any work in the last 12 months. Normally, the survey would apply the legal minimum age for working, (for example, covering persons aged 15 years and over). There may however be interest expressed among data users in finding out also about the experiences of children, and particularly any occupational injuries suffered by children. In this case, it may be desirable to use a much lower age cut-off point, such as ten or even five years.

On the second and subsequent pages of the questionnaire, a separate column is used for entering the information about each eligible person. First, it is worth noting whether the information is being collected directly from the person concerned, or from a proxy respondent. Whenever possible, information should be collected directly from the person, since that approach is likely to yield data of higher quality. A proxy should only be used if it proves impossible to secure an interview directly with the eligible person.

Question 9 provides space for the interviewer to record details for up to three main work activities (jobs) performed by each person over the last 12 months. For each activity, information is sought on the occupation, branch of economic activity (industry) and status in employment. The aim here is to collect the information from each job, to be used as the denominator in estimating the comparative measures mentioned in chapter 6.

One important issue concerns the coding of occupation and industry. The way in which the responses to these questions are coded will depend on how the survey responses are to be used. If the aim is simply to obtain general rates of occupational injury for the population as a whole, then it may be adequate to use a prepared list of major codes, corresponding to the tabulation categories in ISIC Revision 3 and the major groups of ISCO-88 (see chapter 5 and annex 1). This is the approach adopted in the questionnaire shown here. In the body of the questionnaires, simple headings (occupational group, branch of economic activity (industry), and status in employment) have been used, because of space limitations, but the interviewer would in fact need to ask the questions in the form shown at the bottom of the page.

On the other hand, if the concern is to identify particular "high risk" activities or occupations, then it would be better to leave the question open, and to get the interviewer to record as much detail as possible about each person's occupation and economic activity (industry). Office staff would then need to code the responses later to the most detailed level possible. Of course, if information about "high risk" occupations and economic activities is already available, an alternative approach would be to have a pre-coded list of these occupations and industries shown on the questionnaire, with an "other" category provided in each case to cater for other occupations and industries.

Question 9 also collects information about the size of the establishment or unit in which the person works, the number of weeks they have been doing the job in the last 12 months and the usual hours worked per week. The question about the size of the establishment has been left as an open question, since it provides more flexibility for the analyst to use in whatever way he or she chooses. If precodes had been used, this would limit the scope for analysis. The number of weeks worked, and the usual hours worked each week, are both essential items, since they enable one to calculate the total hours of exposure to occupational accidents in the last 12 months.

The next block of questions (nos 10 to 14) is used to determine whether the person has been injured in an occupational accident during the last 12 months, and if he or she has, whether the injury resulted in absence from work or, even if there was no absence, restriction of work activities.

It will be noted that, in its present format, the questionnaire collects information not just about cases of occupational injury where there were days lost from work, but about accidents where there was restricted activity as a result of the accident. Experience from the ILO project tests suggested that there were a significant number of cases of restricted activity, and it therefore seems desirable to collect full information on the injuries received on these cases. If desired, additional follow-up questions could be asked to get an idea of the extent of the restricted activity, and how long it lasted. At the analysis stage, it will of course be possible to analyse separately the two types of cases of injury: those giving rise to lost days or inability to work, and those resulting only in restricted activity.

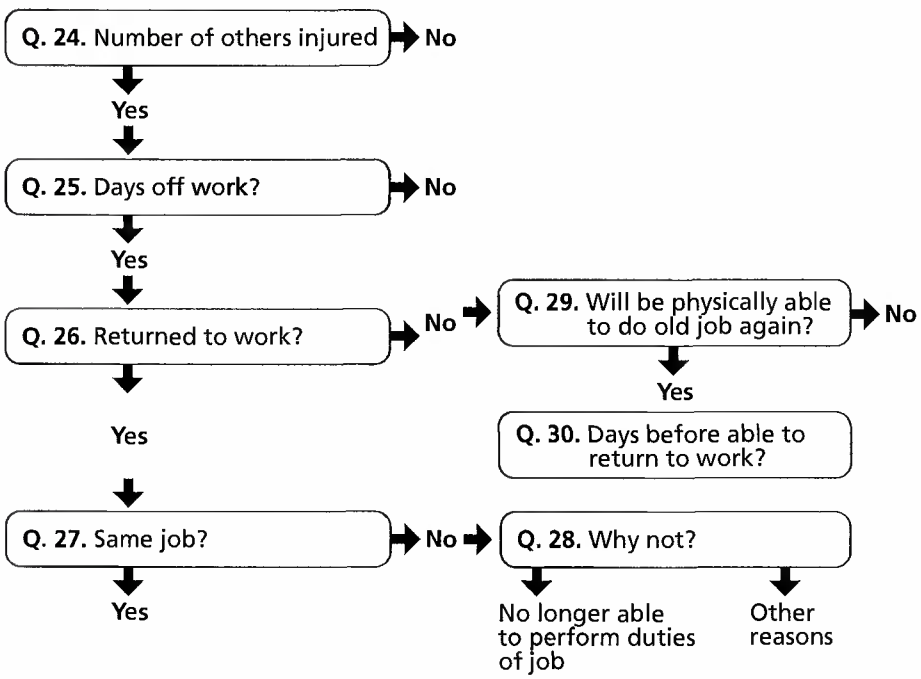
The questions that follow (nos 15 to 23) apply to each person who reports in answer to question 11 that he or she had one or more occupational accidents in the last 12 months. Where a person sustained more than one accident in the 12-month period, information is sought on the two most serious accidents, that is, the accidents that caused the most serious injuries. Here, "serious" is determined in terms of the incapacity resulting from the injury, usually the number of days lost. These questions are asked whether or not the accident involved any lost time from work. The required groups of interest can then be identified at the analysis stage, on the basis of the responses to questions 12 and 14. Questions 15 to 23 collect detailed information on the characteristics of the accident, covering all the optional data items already mentioned in chapter 5: the location of the accident (no. 16), the part of body injured (no. 18), the type of injury (no. 19), the mode of injury (no. 20), the material agency of injury (no. 21), whether the authorities were notified (no. 22) and whether the person received compensation for their injury (no. 23). There is also a question about the date the accident occurred (no. 17). This question is obviously important for ensuring that the accident occurred within the time scope of the survey, but it may also come in useful if a more detailed analysis of occupational injuries is required over the course of the reference year. In carrying out such an analysis,

one would need to be aware of the risks involved in using memory recall as a basis for identification of the exact dates of events; the tendency to "telescope" dates has been noted in several surveys.

The next section of the household questionnaire (nos 24 to 30) provides further information about the effects of the accident, and helps to determine whether the person was temporarily or permanently incapacitated as a result of the accident. The flow diagram shown in figure 8.1 illustrates how the answers to these questions can be used to distinguish between permanent and temporary incapacity.

An initial question (no. 24) asks how many other people were injured in the same accident. Besides being useful as a variable in its own right, the answer here can be used to estimate the total number of accidents (in contrast to injuries). For this, one is first added to the number reported in question 24. This gives the total number of people involved in the accident, including the informant. The reciprocal of this number can then be used as a weight, and applying the weight to the total number of cases of injury will yield the number of accidents. Provided this weight is used, various other tables of interest concerning accidents (in contrast to injuries) can be generated.

Figure 8.1
Distinguishing between temporary and permanent incapacity from the answers in the household survey questionnaire



From the bottom of figure 8.1, it can be seen that permanent incapacity can arise in a number of ways. The person may already have returned to work, but to a different job now, because he or she is no longer able to physically perform the job occupied before the accident. Amongst those who are still off work, permanent incapacity can arise in two ways, as far as the questionnaire is concerned. First, the person may consider that he or she is not physically able to do the old job (job occupied before the accident) again (i.e. the response to question 29 is "no"). Alternatively, the person may think he or she is able to perform in the old job, but the length of time away from work (obtained by combining the responses to questions 25 and 30) comes to at least 365 days, so the incapacity is counted as permanent.

If it is felt that more information would be useful about the causes of permanent incapacity, additional questions could be introduced after questions 27 and 28, to obtain more detail about why the person cannot perform the duties of the old job, or why the person thinks he or she will not be able to do so in the future.

The final section of the household questionnaire (31 to 36) contains a number of questions about fatalities arising from occupational injuries. If it is decided to collect data on occupational fatalities in this survey, the information should be obtained by interviewing one knowledgeable member of the household. Because fatalities are a relatively rare event, a reference period of five years is used, in order to capture more information, and the resulting data will need to be converted to an annual basis at the analysis stage.

It is acknowledged that, in countries where any discussion of death is unwelcome, it will be virtually impossible to ask questions about fatalities. Other problems that may arise with these questions include the difficulty of memory recall over a five-year period, the difficulty of distinguishing between work-related and other deaths and, even among work-related deaths, the difficulty of distinguishing between deaths arising from occupational injuries and those arising from occupational illnesses.

In terms of the flow of the interview, it is probably best to begin by recording the names of all household members in question 2, starting with the head of household. Then the sex, age and relationship to head are recorded. Finally, information is sought in question 6 about the work status of each person, and the interviewer uses this and the age information to determine the eligible members. These ID numbers are then transferred to all the later pages.

For convenience, a line has been included at the top of the second page in which the interviewer can record the name (or nickname) of each eligible person. The use of a nickname may be an additional help in identification, and should assist the interviewer to avoid confusion in distinguishing household members. The third line on the second page is for the interviewer to record whether the infor-

mation is being collected directly from the person who had the injury or from some other person. This is valuable information, in trying to assess the quality of injury data provided by household members. Question 8 is then asked of all eligible members, followed by question 9.

When designing the questionnaire, it may be helpful to take note of the resources available on the ILO web site, in relation to LFS[2] and child labour surveys.[3] Although the latter questionnaires are designed to elicit information concerning child labour, many of them are relevant to a household survey on occupational injuries.

[2] See http://www.ilo.org/dyn/lfsurvey/lfsurvey.home.
[3] www.ilo.org/ipec/index.htm.

Implementing the household survey

Training

The technical language of occupational injuries poses certain problems for those training others to carry out surveys on this topic. The trainers must therefore first make sure that they are themselves fully conversant with the terminology, so that they will be in a position to pass on their knowledge to their trainees. In the course of the pilot work for the ILO project, the ILO developed a set of training material on various technical issues related to occupational injuries, and this is reproduced in annex 5. It is useful to include the training mock interviews and exercises based on the relevant concepts, classifications and procedures.

Because the household survey covers a very specialized topic, it is important that field staff be given sufficient training about the goals and importance of the survey, so that they will feel comfortable in introducing the survey to their informants, thus ensuring their cooperation.

The following problems were encountered in the ILO project during fieldwork, and it would be useful to provide appropriate training to deal with them:

- many callbacks needed because some respondents were not present during the initial interview and there was no proxy respondent who could answer most questions;
- respondents' memory lapses hampered the flow of questions and answers;
- respondents became bored or annoyed with answering questions;
- sample households on vacation and not expected to return within the survey period;
- time needed to explain to respondents the goals and importance of the survey, to convince them to participate;
- some respondents may ask for incentives to provide information.

Consideration should also be given to providing appropriate training to staff involved in encoding responses and structural and consistency edit procedures, where they are not familiar with the subject matter.

Fieldwork

In the case of household surveys, efforts should be made by the enumerator to meet all household members who are eligible for inclusion in the survey. In practice this may be difficult to achieve, and some information may well have to be collected through proxies. Proxies should only be used after repeated efforts have been made to try to contact the individual household members (involving say, at least three calls at different times of day). If a proxy is needed, another adult member of the same household should be used rather than a child.

A particular problem in many countries concerns the language to be used in the fieldwork. There may be many different languages, and no one language that is understood by all. It would be appropriate to translate the questionnaire into the most important languages, to facilitate the work of the interviewers when asking questions. If these questionnaires are not provided, and the interviewers are forced to do a translation on the spot, there are likely to be many instances of mistranslation, with consequent effects on the quality of the data. Particular attention needs to be paid to the correct translation of classifications, as well.

When asking questions, interviewers should probe as much as possible to elicit valid answers. In the case of "type of injury" and "part of body injured", the interviewer should avoid whenever feasible the codes for multiple injuries or multiple site.

Quality control

Survey managers with wide experience know the importance of exercising tight quality control over the survey operations, in order to have the best chance of securing data of high quality. Quality control must be maintained over all phases of the survey operation. Particular care is required during the first days of the field operation, to ensure that all interviewers understand and follow their instructions. Field supervisors play a critical role at this stage. Drawing on their previous experience, they will be able to support and encourage their interviewers, so that the interviewers quickly gain confidence in administering the questionnaire. As part of the quality control procedures, field supervisors must carefully review all completed questionnaires. Before returning questionnaires to headquarters, they should ensure that all eligible respondents were interviewed, and that the questionnaires have been filled out correctly.

Recommended minimum model

The model of the questionnaire described so far applies in the case where a survey is being carried out on a stand-alone basis and no other information is available from other sources. Where the occupational injury data are to be collected as an add-on to an existing survey, it will be possible to greatly reduce the number of additional questions to be asked.

If data are only needed to calculate the indicators described in chapter 6, and detailed information about each accident is not required, and if the extensive LFS already collects adequate information on all jobs done in the last 12 months, including hours worked, then an **absolute minimum** model questionnaire could involve the following questions taken from the questionnaire shown in the appendix to this chapter:

- **Questions 10 to 14:** to establish whether the person had had an occupational accident.

If information is only needed for the most serious accident, question 13, which asks how many accidents the person had in the last 12 months, could probably be dropped. Very few people will report more than one accident during the reference period in any case. Question 14 could also be dropped, if information is not needed about cases of restricted activity without lost days.

- **Questions 24 to 30:** to determine how many days the person lost as a result of the accident, and whether the accident resulted in permanent or temporary incapacity.

For simplicity, the questioning could be limited to just the most serious accident in the last 12 months, instead of considering up to two accidents for each person. Question 24 could be dropped, if one is interested only in cases of injury, and not in trying to estimate the total number of accidents.

- An additional question to provide a **link** between the details of the accident shown above and the job that the person had at the time of the accident.

All of these questions could easily be fitted onto a single A4 page, which could be used as an add-on module to an ongoing survey such as a LFS.

APPENDIX 8.1

Model questionnaire for household survey

Household survey on occupational injuries

Region/province | | |

Enumeration area | | | |

Household number | | |

Explain: This survey is being carried out by (*the Statistics Office*) in accordance with (*the official Statistics Act*). All the information collected in the survey will be treated as strictly confidential. The results of the survey will be presented in the form of tables and no information about individuals will be released to anyone.

Household composition

ID no.	Name	Sex M=1 F=2	Age last birthday	Relationship to head	Did this person do any work at all (that is, work for wages, salary, profit, or family gain, in cash or in kind) in the last 12 months (that is, since.....) ? Yes =1, No=2	Eligibility for survey (*based on Q4 and Q6*) Y=1, N=2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

Relationship to head: Head = 1; Spouse = 2; Son = 3; Daughter = 4; Other relative = 5; Non-relative = 6

Date of interview: dd | mm | yyyy

Name of interviewer: _____

IDs of eligible persons (from page 1, column 7)					
Name (nickname)					
Is the information below provided Yes	1	1	1	1	1
by this person ? No	2	2	2	2	2
8. How many different jobs or economic activities have you done in the last 12 months? *(include main and secondary jobs)*					
9. For each of the jobs or economic activities that you did over the 12 months, please indicate:					
JOB/ACTIVITY A (most recent job)					
a) Occupational group *(see codes)*					
b) Economic activity *(see codes)*					
c) Status in employment *(see codes)*					
d) Number of people working in the establishment/unit *(approx.)*					
e) Number of weeks with some work					
f) Usual hours worked per week					
JOB/ACTIVITY B (next most recent job)					
a) Occupational group *(see codes)*					
b) Economic activity *(see codes)*					
c) Status in employment *(see codes)*					
d) Number of people working in the establishment/unit *(approx.)*					
e) Number of weeks with some work					
f) Usual hours worked per week					
JOB/ACTIVITY C					
a) Occupational group *(see codes)*					
b) Economic activity *(see codes)*					
c) Status in employment *(see codes)*					
d) Number of people working in the establishment/unit *(approx.)*					
e) Number of weeks with some work					
f) Usual hours worked per week					

CODES

Occupational group codes (ISCO-88)

ASK Type of work done in this job/activity
Main tasks and duties of the job/activity

01. Legislators, senior officials, managers
02. Professionals
03. Technicians and associate professionals
04. Clerks
05. Service, and shop and market sales workers
06. Skilled agricultural and fishery workers
07. Craft and related trade workers
08. Plant and machine operators and assemblers
09. Elementary occupations
10. Armed forces
11. Not known

Economic activity code (ISIC Rev. 3)

ASK Type of goods/services produced at this location
Main function of the establishment

01. Agriculture, hunting and forestry
02. Fishing
03. Mining and quarrying
04. Manufacturing
05. Electricity, gas and water supply
06. Construction
07. Wholesale and retail trade, repairs
08. Restaurants and hotels
09. Transport, storage and communication
10. Finance
11. Real estate and business services
12. Public administration
13. Education
14. Health and social work
15. Community and personal services
16. Private households with employed persons
17. International organizations
18. Not known

Status in employment codes (ICSE-1993)

ASK Employment status in that job

1. Employee
2. Employer
3. Own-account worker
4. Member of producers' cooperative
5. Contributing family worker
6. Worker not classifiable

Copy person ID from page 2 →										
10. Have you ever been hurt in an occupational accident (that is, an unexpected event that happened at work or in connection with your work and that caused you personal injury or illness) ? *Yes 1 No 2 → Next person*	1 2		1 2		1 2		1 2		1 2	
11. Did any of these accidents occur in the last 12 months, that is, since .....? *Yes 1 No 2 → Next person*	1 2		1 2		1 2		1 2		1 2	
12. And did any of the injuries you received in the last 12 months result in you being absent from work, or unable to work, for at least one day, apart from the day of the accident ? *Yes 1 No 2 → Question no. 14*	1 2		1 2		1 2		1 2		1 2	
13. How many of these injuries (with lost time) did you have in the last 12 months? → *Question no.15*										
14. But did any of these occupational injuries in the last 12 months seriously restrict your work activities as a result of the injury even though you were not absent from work or unable to work ? *Yes 1 No 2 All → Next person*	1 2		1 2		1 2		1 2		1 2	
I would like to ask you about (this accident or the most serious/second most serious one) **15.** In which of the jobs you mentioned earlier were you working at the time of the accident?	**Most** A B C	**Second** A B C	**Most** A B C	**Second** A B C	**Most** A B C	**Second** A B C	**Most** A B C	**Second** A B C	**Most** A B C	**Second** A B C
16. Where were you when the accident took place? Were you ... .In your usual work area in the establishment/unit	1	1	1	1	1	1	1	1	1	1
....Somewhere else in the estab./unit	2	2	2	2	2	2	2	2	2	2
....In your usual work area away from the establishment/no fixed work area (e.g. for lorry driver, taxi driver, travelling salesman, construction worker)	3	3	3	3	3	3	3	3	3	3
....On work-related travel	4	4	4	4	4	4	4	4	4	4
....Or somewhere else (*specify*)	5	5	5	5	5	5	5	5	5	5
....Not known	6	6	6	6	6	6	6	6	6	6
17. When did the accident happen ? Month										
Year										
accident? *(one code only)*										
1. Head	1	1	1	1	1	1	1	1	1	1
2. Neck	2	2	2	2	2	2	2	2	2	2
3. Back	3	3	3	3	3	3	3	3	3	3
4. Trunk or internal organs	4	4	4	4	4	4	4	4	4	4
5. Upper extremities	5	5	5	5	5	5	5	5	5	5
6. Lower extremities	6	6	6	6	6	6	6	6	6	6
7. Whole body or multiple sites	7	7	7	7	7	7	7	7	7	7
8. Not known	8	8	8	8	8	8	8	8	8	8

Copy person IDs from page 2 →										
	Most	**Second**	**Most**	**Second**	**Most**	**Second**	**Most**	**Second**	**Most**	**Second**
19. What **type of injury** did you receive to your *(part of body mentioned)* ? *(one code only)*										
1. Superficial injury	1	1	1	1	1	1	1	1	1	1
2. Fracture	2	2	2	2	2	2	2	2	2	2
3. Dislocation, sprain, strain	3	3	3	3	3	3	3	3	3	3
4. Amputation	4	4	4	4	4	4	4	4	4	4
5. Concussion, internal injury	5	5	5	5	5	5	5	5	5	5
6. Burn, corrosion, scald, frostbite	6	6	6	6	6	6	6	6	6	6
7. Acute poisoning or infection	7	7	7	7	7	7	7	7	7	7
8. Other injury (*specify*)	8	8	8	8	8	8	8	8	8	8
9. Not known	9	9	9	9	9	9	9	9	9	9
20. **How** did the injury occur? *(one code only)*										
01. Contact with electric voltage	01	01	01	01	01	01	01	01	01	01
02. Contact with temperature extreme	02	02	02	02	02	02	02	02	02	02
03. Contact with hazardous substance	03	03	03	03	03	03	03	03	03	03
04. Drowning, buried	04	04	04	04	04	04	04	04	04	04
05. Fell or crashed into something	05	05	05	05	05	05	05	05	05	05
06. Struck by something	06	06	06	06	06	06	06	06	06	06
07. Collided with something	07	07	07	07	07	07	07	07	07	07
08. Came into contact with sharp/pointed/rough/coarse element	08	08	08	08	08	08	08	08	08	08
09. Trapped, crushed	09	09	09	09	09	09	09	09	09	09
10. Suffered acute overloading of body	10	10	10	10	10	10	10	10	10	10
11. Received bite, kick	11	11	11	11	11	11	11	11	11	11
12. Other reason (*specify*)	12	12	12	12	12	12	12	12	12	12
13. Not known	13	13	13	13	13	13	13	13	13	13
21. Which item or agent, if any, **caused** the injury? *(one code only)*										
01. Buildings, structures	01	01	01	01	01	01	01	01	01	01
02. Prime movers (engines, etc.)	02	02	02	02	02	02	02	02	02	02
03. Distribution systems	03	03	03	03	03	03	03	03	03	03
04. Hand tools	04	04	04	04	04	04	04	04	04	04
05. Machines, equipment	05	05	05	05	05	05	05	05	05	05
06. Conveying/transport/packaging equipment, or vehicles	06	06	06	06	06	06	06	06	06	06
07. Materials, objects	07	07	07	07	07	07	07	07	07	07
08. Chemical substances	08	08	08	08	08	08	08	08	08	08
09. Humans, animals, plants, etc.	09	09	09	09	09	09	09	09	09	09
10. Other (*specify*)	10	10	10	10	10	10	10	10	10	10
11. None	11	11	11	11	11	11	11	11	11	11
12. Not known	12	12	12	12	12	12	12	12	12	12
22. Was your injury **notified** to ... Yes	1	1	1	1	1	1	1	1	1	1
(agency responsible for No	2	2	2	2	2	2	2	2	2	2
health and safety) ? Don't know	3	3	3	3	3	3	3	3	3	3
23. Did you, or do you expect to, receive any financial compensation for your injury from *(accident compensation/social security scheme)*? Yes	1	1	1	1	1	1	1	1	1	1
No	2	2	2	2	2	2	2	2	2	2
Don't know	3	3	3	3	3	3	3	3	3	3

Copy person IDs from page 2 →										
	Most	**Second**	**Most**	**Second**	**Most**	**Second**	**Most**	**Second**	**Most**	**Second**
24. How many others were injured in the same accident ? (None: 0)										
25. How many calendar days (were you / have you been) away from work or unable to work because of the injury ?										
26. Have you returned to work yet ? *Yes 1 No 2 → Question no. 29*	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
27. Did you return to the same job that you were doing at the time of the accident ? *Yes 1 → Question no. 31 No 2*	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
28. Why did you not return to the same job? Was it because you are no longer able to perform the duties of the job you had before the accident, or was it for some other reason ? *Cannot perform old job 1 → Q. no. 31* *Other reason (specify) 2 → Q. no. 31*	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
29. Do you expect to be physically able to carry out the duties of your old job or economic activity again (whether or not you return to the same job or economic activity) ? *Yes 1 No 2 → Question no. 31*	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2	1 2
30. How many more days will it be before you are physically able to return to work (whether or not you do actually return) ?										

***QUESTIONS TO ONE ADULT IN HOUSEHOLD** (usually head of household)*

31. Has any member of this household died in the last five years, that is, since .....?	Yes: No:	1 2 →	*END INTERVIEW*
32. How many deaths have there been in the last five years?			
33. Did (any of them / this person) die as a result of an accident at work ?	Yes: No:	1 2 →	*Q35*

34. For each person who died as a result of an accident at work, please give the following information:	**Case 1**		**Case 2**	
	Month	Year	Month	Year
Month and year of accident				
Month and year of death				
Sex (Male 1, Female 2)	1 2		1 2	
Age at time of death *(in completed years)*				
Occupational group at time of accident *(use ISCO coding frame)*				
Economic activity at time of accident *(use ISIC coding frame)*				

END INTERVIEW

Establishment surveys 9

This chapter describes the characteristics of establishment surveys for the collection of data on occupational injuries, giving advice on the special issues involved in measuring this topic. A model questionnaire is provided for stand-alone surveys and for short modules of questions that can be attached to existing establishment surveys, as well as examples of questions that could be inserted in establishment survey questionnaires.

Planning the establishment survey

Coverage

The survey may either be carried out across the whole country, and covering all sectors of economic activity (industry), or it may be limited to certain parts of the country or certain economic activities. Establishment surveys are a particularly useful option when the objective is to examine the occupational injury rate in particularly hazardous industries, since those industries can easily be identified from the sampling frame.

One disadvantage of most establishment surveys conducted by national statistical offices is that certain establishments are likely to be omitted from the sampling frame completely. For instance, it is usually the case that government departments are excluded, and a special survey of public service employees would need to be mounted, in order to collect occupational injury data for them. Certain sectors of the economy, such as the informal sector, are likely to be excluded from the survey frame, and the frame may well not cover those engaged in agricultural activities.

For many countries, the coverage of the establishment survey for collecting data on occupational injuries in terms of branches of economic activity (industry) and sizes of establishments will be determined by the coverage and completeness of the business register or register of establishments that serves as the sample frame. All major areas of the country should be included, to ensure the representativeness of the survey. It may, however, be necessary for administra-

tive or technical reasons to limit the coverage to districts of special importance or to urban areas, possibly because of the importance of the industries located there.

As stated earlier, establishments are only in a position to provide information about their employees, thus the survey coverage has to be restricted to employees. Care needs to be taken that information is collected about all employees of each establishment included in the survey sample, including casual workers, part-time workers, temporary or seasonal workers, as well as employees who work outside the premises of the establishment.

Sampling

One important consideration is whether one should use the business enterprise or the business establishment as the unit for data collection. The normal preference is to use the establishment, since it is the basic unit within the enterprise which carries out a single type of economic activity at a single physical location. The enterprise, on the other hand, may well carry out a range of different economic activities at different locations, and this would make collection of data difficult. More importantly, it would mean that the data could not be classified adequately according to economic activity (industry) or even geographic region.

In many countries the national statistics office has a suitable sampling frame of business establishments or enterprises, which is used for their regular business surveys or surveys of employment and earnings. However, many offices have difficulty keeping their business registers up-to-date. Often the frame contains a lot of "dead wood" – establishments that have gone out of business – and often there is a delay in getting new establishments onto the register. Despite its problems, the business register can provide an extremely useful sampling frame, especially as it shows the economic activity (industry) in which each business is engaged. It also probably provides some measure of size for each establishment. This information is extremely useful, since it will enable the researcher to focus on occupational injuries in particular industries, if so desired.

The measure of size is also very useful from a sampling point of view. It is common practice to select automatically all business establishments above a certain size (say 100 employees in a small country or 1,000 employees in a large country) and then to progressively use sampling for smaller establishments. Probably no more than 5 or 10 per cent of the smallest establishments in the register will be covered in the survey. Adjustments need to be made at the processing stage to compensate for these variable sampling rates.

Inevitably there will be a cut-off point in terms of size of establishment. Establishments below a certain size (usually five or ten employees) are likely to

be excluded entirely from the sampling frame, and so will have no chance of being selected for the survey. It may be that the point of cut-off for smaller establishments varies from industry to industry.

The sample design should take into account the possibility of non-response due to a variety of reasons (gone out of business, unwilling to supply information, etc.) One possible way of doing this is to have an additional list of sample establishments (substitute establishments) which could be used to replace non-responding establishments. However, although this is sometimes done, the practice is not usually recommended. A better approach, which leads to less bias, is to slightly inflate the sample in advance (i.e. over sample) so as to make allowance for the expected non-response.

Questionnaire design

In designing the questionnaire for an establishment survey, attention should be paid to how the questionnaire will be completed. In the case of the questionnaire for the household survey, the actual completion of the questionnaire is done by an interviewer, working for the agency that is carrying out the survey. In the case of an establishment survey, it is much more likely that the questionnaire will be completed directly by an official of the establishment. One possibility is that the survey will be carried out by mail survey, with the establishment receiving the questionnaire in the post. An alternative approach will be for an interviewer to drop off the questionnaire at the establishment. This latter approach is more expensive, but it does have the merit of ensuring that the right person receives and looks at the questionnaire, and the interviewer can provide explanations, if needed, and explain the objectives of the survey and the uses of the data. Whichever approach is adopted, it is essential that the questionnaire contains adequate instructions to enable the person filling in the form to complete their task. With either a mail-out or interviewer approach, the completed forms could be collected by an interviewer, which would give the respondent a chance to clarify any points that are unclear, or the respondent could be asked to mail back the completed questionnaire. In this latter case, a stamped self-addressed envelope could be provided, so as to encourage a positive response.

The model questionnaire proposed for use in an establishment survey is shown in the appendix at the end of this chapter (p. 103). It contains all the information that would be required in a stand-alone survey, if full information on each injury is collected. In a later section a recommended minimum model questionnaire is presented, which could be used in the situation where detailed information on number of workers and hours worked has already been collected in another survey.

The top half of the first page is for recording identification information. The identification number of the selected establishment, taken from the business register, is recorded at the top on the right. The establishment is asked to record full details about itself: its name, location, mailing address, telephone number, fax number, email and web site (if any). It is also asked to give information about the type of goods or services produced, and the main function of the establishment. This information is usually already available in the business register from which the sample was drawn, and it may even be incorporated within the ID number of the establishment, but collecting additional information on the spot will allow the editing staff at the headquarters of the statistics office to check that the business has been given the correct industry code in the business register. Sometimes an establishment changes its main activity over time, and this is a chance to make the necessary corrections to the business register, and to give the establishment its correct industry code for the purposes of the analysis. The industry code will be inserted in the office after the completion of fieldwork.

The final item in the top section is the name and position of the person completing the questionnaire. This information is particularly useful if one needs to return to the establishment at a later stage to obtain some missing information, or if one wishes to verify some entry by means of a telephone call.

The bottom part of the first page (section A) is used to collect the essential information about the total number of workers in the establishment and the hours worked, which form the denominators for three of the indicators: number of workers for the incidence rate, and hours worked for the frequency and severity rates.

It may be recalled from chapter 5 that, in addition to the four essential data items (number of workers, hours worked, cases of occupational injury and days lost) there were six other useful variables which could prove useful for analysis. These six variables were: sex, age, occupation, branch of economic activity (industry), status in employment and size of establishment. If indicators are to be calculated for some subgroup of the workers in the establishments covered by the sampling frame (e.g. by sex or for a certain age group), it is necessary to ensure that the information is collected for the variable, not just for the person who had the injury but for all workers within the establishment.

From the model questionnaire, information can be obtained on three of the six variables: sex (directly from the data in section A); branch of economic activity (industry) from the information contained in the ID number for this establishment, confirmed by the information on economic activity (industry) collected at the top of this form, and this code will apply to all workers in the establishment; and size of establishment (the average number of persons who worked in the establishment last year, as indicated in section A). Indicators for subgroups involving three of the variables (age, occupation and status in employment)

could not be calculated because information on the distribution of these characteristics for all workers is not available from the selected establishments.

Respondents are asked to record the information about total employment in respect of the last calendar year, rather than in respect of the last 12 months. This is done for two reasons: it is probable that many larger establishments find that this is the easiest way to provide the information, and the use of specific time periods will ensure comparability of the data across all establishments, even though the establishments in the sample might be visited at different times. The occupational injury data can then be collected for the same calendar year.

Section B of the questionnaire is used to collect detailed information on each case of occupational injury (including fatalities) that occurred in the establishment in the last calendar year. The actual information collected is very similar to that already discussed in relation to the household survey modules, and the detailed coding frames used are those discussed in chapter 5. Space has been allowed for recording up to ten cases of injury in the establishment. The ID numbers have been pre-printed on the form, but if the establishment had more than ten injuries during the year, additional forms should be used, but the ID numbers will need to be revised. The following information is collected in respect of each case of injury.

First, there are some basic classification questions: the time of the accident in terms of month and year, to make sure the accident falls within the time scope of the survey; the sex and age of the injured person (nos 2 and 3); and the occupation and status in employment (nos 4 and 5). Then follow some questions about the accident itself: the place where the accident occurred (no. 6), the part of the body injured (no. 7), the type of injury received (no. 8), how the injury occurred (no. 9), and the agent or item causing the injury (no. 10).

Then there are some questions about the consequences of the accident: whether the injury was notified to an occupational safety or health agency (no. 11), whether accident or social security compensation was paid (no. 12) and whether the accident was fatal (no. 13). For non-fatal cases, information is sought about how long the injured person was absent from work (no. 14), whether he or she has returned to work (no. 15), and if not whether the establishment expects the person to return to work (no. 16), and if so, how much longer he or she is likely to be absent from work (no. 17).

Finally, a question is asked about the number of other people injured in the same accident (no. 18). This information enables one to estimate the total number of accidents, in contrast to the total number of injuries arising from those accidents.

For both parts A and B of the questionnaire, the informant is asked to provide details of the source of the data provided. It will be useful to know whether the information has been taken from accident forms, or from an accident ledger or some other written source, or whether the information has simply been collected by word of mouth through recall or estimated by the person completing the form.

Right at the end of the questionnaire, there is a box in which the informant is asked to show the minimum number of days of injury required for the injury to be recorded in their records. In some countries, injuries may only be recorded if the person has been away for, say, at least three working days, and such a limitation would clearly have a bearing on the completeness of the injury data collected.

Implementing the establishment survey

Training

Several of the points that were made about training needs for household surveys apply also to establishment surveys, but a few other points are of special interest. If the survey is to be carried out by personal visits to establishments, interviewers need to be trained in how to introduce the survey to their respondents. Managers of establishments are busy people, and may resent devoting time to this survey, unless they can see some benefits, either for themselves or for establishments generally. Obviously it is not possible to promise any particular outcome from the survey that might benefit the establishment, but it should be possible to encourage the participation of the establishment, by emphasizing the importance of having up-to-date information about the extent of the problem. In certain branches of economic activity (industry), occupational injuries are an important cause of time lost from work, and anything that can be done to reduce this unnecessary loss is to be encouraged.

The assistance of relevant employers' organizations and associations, chambers of commerce, etc. should be sought, as these may play an important role in obtaining the cooperation of managers, and in gaining their confidence in the importance of the survey and usefulness of the results.

Special efforts should be made to publicize the surveys. Brochures can be prepared for distribution to interested parties, and radio and television advertisements can be used. Key officials can be interviewed on television, to emphasize the importance of the topic. The use of radio is particularly useful in rural areas of less developed countries, where there may be no televisions. Other novel

approaches can be used, for instance, the use of a toy or mascot placed in supermarkets, so as to attract interest and raise awareness. The training course itself can be used as an opportunity for awareness-raising in the community, and for sensitizing the public about the issue of occupational injuries.

Fieldwork

While it may be possible to get a reasonable response to establishment surveys in certain countries, securing a useful response rate is much more problematic in others. In general, it is found that establishment surveys are more difficult to carry out successfully in developing countries than are household surveys. It may be the case that establishments do not keep proper records of occupational injuries, so information for the survey has to be collected by means of recall.

Quality control

A major problem is keeping the establishment register from which the sample is drawn up-to-date. If there are major flaws in the register, no survey, however well implemented, can be accurate. Even if the register is adequate, a great deal of effort is required, with frequent visits to establishments, to ensure the cooperation of business establishments. The survey should not be allowed to drag on for a long time. Careful supervision of field staff is required to ensure that establishments are located quickly, and then visited. If the questionnaire is left at the establishment, only a short time should be allowed for its completion and return, by post or by collection.

The ILO project revealed a number of difficulties in collecting occupational injury and other data from establishments, for which particular attention is needed in training of enumerators, in fieldwork and in quality control. These include:

- Personal illnesses and injuries that were not work-related were also reported; this was only detected during verification with the establishments concerned;
- The number of accidents were reported instead of the number of cases of injury;
- Cases of injury resulting from accidents that occurred outside the reference period were also reported;
- The age of injured employees was sometimes not reported, so that callback was necessary;
- There was sometimes a lack of consistency between the responses to "How did the injury occur?" and to the question on the agent/item causing the injury;

- When there were several cases of injury resulting from a single occupational accident, the answer to "How many other employees were injured in the same accident?" was given as 0, instead of the correct number.

Recommended minimum model

Rather than carrying out a complex stand-alone survey to collect occupational injury data from establishments, it may well be appropriate to add a few questions as a "rider" to an establishment survey. If this approach is adopted, the following questions would appear to be the minimum that can be asked (the question numbers refer to the numbers used in the full model of the establishment questionnaire shown in the appendix to this chapter). It is here assumed that the main survey has already collected detailed information about the establishment, including employment and hours worked over the course of a full year, so that this information does not need to be collected again.

The minimum model would then include the following questions:

- Please provide information about each case of occupational injury (including fatalities) incurred by persons employed by this establishment in the last calendar year, either on the premises or elsewhere. (Note: To count as an occupational injury, the injured person should have been absent from work for at least one day, excluding the day of the accident.)
- **Nos 2 and 3** Sex and age of person
- **No. 4** Occupational group (optional)
- **No. 13** Was the accident fatal?
- **No. 14** How long was the injured employee absent from work?
- **No. 15** Has the person returned to work?
- **No. 16** Do you expect the person to return to work?
- **No. 17** How much longer do you expect the injured person to be absent from work?
- **No. 18** How many other people were injured in the same accident?

The information should be collected with respect to each case of occupational injury in the establishment, and not aggregated until the analysis stage. In that way it is possible to carry out the required cross-tabulations. Once the data has been aggregated, information about individuals is lost.

APPENDIX 9.1

Model questionnaire for establishment survey

Establishment survey on occupational injuries

☐☐ ☐☐ ☐☐

The (Statistical Office) is carrying out a survey to collect information on occupational injuries. The survey is being carried out under (the Statistics Act) and all information you provide will be treated in strict confidence. The results will be published in summary form, and it will not be possible to identify information for particular establishments.

Name of establishment _____ Tel. no. _____

Physical location _____ Fax no. _____

_____

Mailing address (if different) _____ Email _____

_____

Type of goods/services produced, and main function of this establishment _____ Web site _____

Name and position of person completing this questionnaire _____

A Average number of persons working in this establishment and total hours worked by these persons during each quarter

Persons working in this establishment: Include all people working here, whatever their employment status. Also include employees on sick or maternity leave, those away on paid vacation or holiday, and employees working away from the establishment but paid by and under the control of the establishment.

Total hours worked: This refers to the total hours worked by all persons working here. It includes waiting time and overtime, but excludes time paid for but not spent in work, such as sick leave and paid vacation leave. *If the data required are not available, you should compute the total by using the normal hours worked by each person during the quarter multiplied by the average number of persons working here.*

	Average number of persons working here				Total hours worked by all persons during each quarter			
	Last year Q1	*Last year* Q2	*Last year* Q3	*Last year* Q4	*Last year* Q1	*Last year* Q2	*Last year* Q3	*Last year* Q4
Men								
Women								
Total								
Source of data (records, estimates, etc.)								

B Cases of occupational injury

Please provide information about each case of occupational injury (including fatalities) incurred by persons working in this establishment in the last calendar year, that is between 1 January and 31 December (year). Enter the appropriate code in each column. Cases of occupational injury are those cases where, as a result of their injuries, the injured employees did not work for **at least one day**, excluding the day of the accident.

TOTAL NUMBER OF CASES OF OCCUPATIONAL INJURY: ☐

	Case of injury	1	2	3	4	5	6	7	8	9	10
1	Month and year of accident — Month (Jan=01)										
	Year (e.g. 07)										
2	Sex — Male: 1 Female: 2										
3	Age *(in completed years)*										
4	Occupational group *(insert one code in each column)* 01 Legislators, senior officials and managers 02 Professionals 03 Technicians and associate professionals 04 Clerks 05 Service workers, shop and market sales workers 06 Skilled agricultural and fishery workers 07 Craft and related trades workers 08 Plant and machine operators and assemblers 09 Elementary occupations										
5	Status in employment *(insert one code)* 1 Employee 4. Member of producers' cooperative 2 Employer 5. Contributing family worker 3 Own-account worker 6. Worker not classifiable										

	Case of injury ID	1	2	3	4	5	6	7	8	9	10
6	Location of accident *(insert one code in each column)* 1 At usual work area in the establishment 2 Somewhere else in the establishment 3 At usual work area away from the establishment or at no fixed work area 4 On work-related travel 5 Somewhere else (*specify*)										
7	Part of body injured *(insert one code)* 1 Head 2 Neck 3 Back 4 Trunk or internal organs 5 Upper extremities 6 Lower extremities 7 Whole body or multiple sites equally injured 8 Others (*specify*)										
8	Type of injury *(insert one code)* 1 Superficial injury 2 Fracture 3 Dislocation, sprain, strain 4 Amputation 5 Concussion, internal injury 6 Burn, corrosion, scald, frostbite 7 Acute poisoning or infection 8. Other injury (*specify*)										
9	How did the injury occur ? *(insert one code)* 01 Contact with electric voltage 02 Contact with extreme temperature 03 Contact with hazardous substance 04 Drowning, buried 05 Fell or crashed into something 06 Struck by something 07 Collided with something 08 Contact with sharp/pointed/rough element 09 Trapped, crushed 10 Suffered acute overloading of body 11 Received kick, bite 12 Other reason (*specify*)										
10	Agent/item causing injury *(insert one code)* 01 Buildings, structures 02 Prime movers (engines, etc.) 03 Distribution systems 04 Hand tools 05 Machines, equipment 06 Conveying/transport/packaging equipment or vehicles 07 Materials, objects 08 Chemical substances 09 Humans, animals, plants, etc. 10 Others (*specify*) 11 None										
11	Was the injury notified to ... *(occupational safety and health agency)*?	1 Yes 2 No									
12	Was (will) compensation (be) paid by (*social security/accident compensation)?*	1 Yes 2 No 3 Don't know									
13	Was accident fatal ? *If fatal* ⟶ *Question no. 18*	1 Fatal 2 Non-fatal									
14	How long was the injured employee absent from work (or absent to date if still absent) ? *(calendar days)*										
15	Has the person returned to work ? *If Yes (returned)* ⟶ *Question no. 18*	1 Yes 2 No									
16	Do you expect the person to return to work ? *If No* ⟶ *Question no. 18*	1 Yes 2 No									
17	How much longer do you expect the injured person to be absent from work (*calendar days)?*										
18	How many other people were injured in the same accident? (None: 0)										

Source(s) of data in Part B (*code all that apply):*
Accident register 1 Asking others 2 Own memory 3 Other methods 4

Minimum period of absence (in days) for injury to be recorded (None: 0): ..... days

THANK YOU FOR YOUR COOPERATION

Data processing and analysis 10

Data editing

Once the questionnaires are received from the field, some form of manual editing should be carried out, to ensure the completeness and consistency of entries. This manual editing will involve the initial receipt and control of questionnaires, their general screening, the editing and coding of questionnaires as required, and a general review of completed questionnaires before they are passed on for electronic processing.

With the development in recent years of interactive data entry software, most errors can be detected at the data entry stage. The importance of manual editing has therefore diminished. Manual editing is most useful for checking the completeness of responses, and for checking identification numbers (of households and individuals, and of establishments) to ensure that the correct numbers have been assigned. Errors in identification numbers are more difficult to detect and correct automatically on the computer, and identification number errors are likely to cause serious errors later on if not corrected in time.

For computer editing to work successfully, detailed editing specifications must be established. Modern computer software makes this a relatively simple task. There are various checks that can be carried out. These include, for instance, the following: range checks, to ensure that all data for a particular field fall within the permitted range; skip checks, to make sure that the skip instructions in the questionnaire have been followed correctly; and consistency checks, to ensure consistency in the responses to different questions (since the response to one question may well have a bearing on the range of permissible responses to another question). Manual editing will still be necessary to correct errors detected by the computer software, unless automatic data correction is done.

Where the data set contains missing values, it may be possible during the edit process to identify these cases, and to use some system of imputation so that all missing values are replaced.

Table specifications

Chapter 5 discussed the four key variables used for analysing occupational injury data. These were: cases of injury, days lost, number of workers and number of hours worked.

Six background variables that are especially useful for analysis were also mentioned. These were: age, sex, occupation, economic activity (industry), status in employment and size of establishment/unit where the person worked.

Chapter 6 introduced four indicators that can be used for measuring the level of occupational injuries. These various comparative measures are obtained from ratios of various pairs of the key variables, adjusted for convenience by some factor such a thousand or a million. For instance, incidence rates involve a comparison of the total number of cases of injury and the total number of workers. The term "workers" is used here for convenience; in practice, it is actually jobs held by workers which are the focus of interest. Frequency rates compare injuries and total hours worked. Mean days lost compare total days lost and the number of injuries. And severity rates are used to compare total days lost and number of hours worked.

As set out in the 16th ICLS resolution, it is recommended that frequency and severity rates be presented per one million person-hours worked. For incidence rates, it is recommended that non-fatal injuries be presented per one thousand workers, but that fatality rates should be presented per 100,000 workers, because of the relatively small number of fatalities.

When designing a survey of occupational injuries, or even when adding on a few questions to an existing survey, consideration should be given to the tabulations to be produced. Appendix 10.1, at the end of this chapter, lists the most important tables that should be produced to provide users with an analysis of total injuries, while Appendix 10.2 provides a listing of the tables of rates that can be calculated.

A few points should be noted. For cases of injury, it is necessary to distinguish fatal from non-fatal injuries, since the incidence rates and frequency rates are given separately for each group (see discussion in chapter 6). Amongst non-fatal injuries, it is helpful to distinguish between those injuries causing temporary and permanent incapacity. These distinctions are needed because the comparative measures for severity rates and days lost apply only to cases of injury with temporary incapacity for work. If one wanted to calculate similar rates for cases of permanent incapacity, some assumption would be needed about the amount of time lost by such cases. Such assumptions are inevitably arbitrary and the resulting comparative measures would be too artificial to be meaningful. It is therefore recommended that such calculations are not done for cases of permanent incapacity.

In the case of the household survey data, it needs to be remembered that a wide definition of injury has been used in the questionnaire. Those providing information about occupational injuries in answer to question 15 and subsequent questions consist of the following people:

a) Question 12 = Yes – injured, and absent from work at least one day

b) Question 14 = Yes – injured with restricted activity, but not absent from work

c) Question 14 = No – reportedly injured, but no restricted activity and no absence from work

In the strict treatment of occupational injury data, using the definition adopted by the 16th ICLS, only the first group would be counted as cases of occupational injury. However, particularly in many developing countries, it is useful to widen the definition of occupational injury to include the second group, but data for the two groups should be presented separately. The third group would not normally count as cases of occupational injury, and should be filtered out at the analysis stage, but it may still be useful to provide some summary figures for this group, to highlight the level of risk that workers face.

In the case of establishment surveys, the questionnaire restricts the definition of occupational injury only to the first group shown above, that is those who are injured and absent from work for at least one day. This narrow definition is used, because it would be very difficult for an establishment to report injuries in the second or third categories. This is another good reason why the reporting of household survey data should be done separately for the first two groups, in that it might allow for some comparisons to be made between the household and establishment survey data.

Where injury rates are calculated, great care is required at the analysis stage to ensure that the correct terminology is used, and that items are measured in the correct units. For instance, there is a need to distinguish clearly between accidents (which may involve several workers) and cases of injury (which relate to individual workers). The term severity should be used only in its technical sense, in measuring the relationship between days lost and total hours worked, and not be used as a way of distinguishing between permanent and temporary incapacity. As far as the calculation of rates is concerned, it is recommended that the 16th ICLS resolution be followed. Thus, incidence rates should be calculated per 1,000 workers, while frequency rates and severity rates are calculated per 1,000,000 hours of work. It may, however, be appropriate to present incidence rates per 100,000 workers, or even more, for groups where these rates are low, otherwise this information may disappear. This is particularly important for tables showing data by sex, since women tend to experience lower rates of injury than men.

Since the interest is normally in occupational injury incurred over a full year, total hours of work for the denominator should be calculated on the basis of a full year, not in respect of a shorter time period.

The comparative measures can be presented either for the total working population as a whole, or for some subgroup within it (such as for employees, by industry and sex). The background variables are therefore only involved when estimates are needed for some subgroup of the population.

In order to get comparative measures, three basic tables are needed for each key variable:

- Age by sex (with ages grouped as follows: <18, 18–24, 25–49, 50+);
- Occupation by sex (single digit for occupation);
- Industry by sex (single letter for industry).

These tables cover four of the six background variables. Information on the fifth variable (status in employment) can be used to generate new sets of the three tables, separately for employees and for all other workers. Similarly, data on the sixth variable (size of establishment) can be used to generate tables covering only people working in establishments of a certain size. These latter tables may be useful for comparing the results from the household survey with similar results produced in the establishment survey. The full list of tables required is shown at the end of this chapter in appendix 1.

The way these tables are generated in practice will now be described. This begins with the tables for the first two key variables – number of workers and number of hours worked – since these sets of tables are required for all workers, not just those with injuries.

The average number of workers in each age group, occupation, industry, etc. cannot be estimated across the whole year, but the number of full-year equivalent jobs can be estimated. Full-year equivalent jobs mean the number of jobs where all workers are counted as working 52 weeks a year, though it says nothing about how many hours they work each week. For instance, if two workers each work 26 weeks a year in a particular industry, then they contribute between them one full-year equivalent job, whether or not they work concurrently. In contrast, a person who does two part-time jobs concurrently throughout the year will contribute two full-year equivalent jobs to the total. To get the number of full-year equivalent jobs, the data are analysed separately for each job shown, but in each case the data are weighted by the proportion of the year (number of weeks divided by 52) that the person is reported as having worked in that job. The separate tables for the first, second, third and fourth jobs are then summed to arrive at the total number of full-year equivalent jobs.

An exactly similar procedure is used to obtain the corresponding tables on hours of work. First, separate tables are produced (e.g. for age by sex) for the first, second, third and fourth jobs. This time the data are weighted by the total hours worked in the particular job (i.e. the number of weeks multiplied by the number of hours usually worked per week in that job).[1] The corresponding cells in each of the four tables are then summed to get the total annual hours worked in all jobs.

For the cases of occupational injury, similar tables are produced to those described above, but this time they will cover only those who report having had a non-fatal occupational injury in the last 12 months. Separate tables will be produced for the first and second reported cases of injury, grossed up to the national level as before, and the corresponding cells from the two tables then combined. It is assumed that the number of people with more than two cases of injury is negligible, but the information given in response to question 13 on the household questionnaire can be used to check this.

Since it is necessary to distinguish between cases of injury resulting in permanent and temporary incapacity, these tables on cases of injury need to be generated twice over, first for cases of permanent incapacity and then for cases of temporary incapacity.

Similar tables on cases of fatal injury should be produced, using the information obtained in response to questions 33 and 34 in the household survey questionnaire, and question 13 in the establishment survey. However, since the overall sample sizes are relatively small, the surveys are unlikely to uncover many fatalities and detailed tables are therefore likely to yield little of value. In preparing these tables, it should be remembered that the data relate to a five-year period. Average annual figures are obtained by dividing all cells by five. It would also be interesting to analyse the data by year of death, to see how the statement about the time of death is affected by recall problems.

One important group on whom no information is collected in the occupational injury survey is the long-term inactive/unemployed, who have difficulty in working now because of an earlier occupational accident. Some information on this group may be available from a larger survey (such as a LFS) if the occupational injury survey is attached as a module to it. In future surveys it might be helpful to try to identify two groups of people affected by an earlier occupational accident: those who did not work at all during the last 12 months and those whose current work arrangements are adversely affected, perhaps involving a change to a less arduous job as a result of an earlier accident.

Special care needs to be taken in applying the grossing up factors when dealing with fatalities as reported in household surveys, since the data relate not to the person being interviewed, but to previous household members. There is no

[1] In this case there are actually two weights to apply, since there will also be the weight associated with the sampling process. To apply the two weights at once, it will be necessary first to create a new variable, which is the multiple of the two weights.

problem if the grossing-up factors are applied at the primary sampling unit (PSU) level or are based on household characteristics. In that case the same grossing-up factor will be used for all household members, including the deceased person. But if the grossing-up is applied at the individual level, on (say) the basis of the national sex-age distribution of the population, then the grossing-up factor should be based on the age and sex of the deceased person, not of the person being interviewed.

In addition to the information on permanent and temporary injuries, and occupational fatalities, the survey data can also be used to get some idea of the relationship between the number of cases of injury and the number of accidents giving rise to those injuries. Some accidents involve just one person, others may involve several people. Question 24 asks how many other people were injured in the same accident. A new variable (say ACC) can then be created which is one added to the number shown in response to Question 24 in the household survey questionnaire. This will therefore represent the total number of people injured in the accident, including the person giving the information. It is then possible to do appropriate cross-tabulations, such as economic activity (industry) by ACC, to get the distribution of all accidents by the economic sector in which they occurred and the number of people involved in the accident. Unfortunately the table will not fully represent the distribution of accidents, since it is based only on information from people who received non-fatal injuries. It will therefore automatically exclude accidents involving a single fatality, since such persons would not have been included in the sample. It may also under-represent all accidents where at least one person suffered a fatality, since these persons would have no chance of been sampled. This will be particularly serious in instances (for example in mining) where one accident can result in several fatalities. But in general, since fatalities represent only a small proportion of total injuries, the table should provide a fairly good representation of the distribution of accidents.

In the establishment survey, Question 18 also asks for the number of other people injured in the same accident. In preparing this table, each record should be weighted by the reciprocal of ACC to account for the overlap among persons injured in the same establishment.

For the total days lost, similar tables are produced, but this time the case-level data need to be weighted by the number of days lost. Again, separate tables need to be produced for first and second cases of injury, and the data from corresponding cells then summed to give total days lost. These tables are produced only for injury cases that satisfy the "temporary incapacity" condition.

If the quality of the data collected in the household survey is to be checked, it may be worth carrying out an analysis of the data in two parts: those data collected directly from respondents, and those collected by means of a proxy. Any differences in the rates obtained from these two groups might help to shed light on the quality of proxy information.

Weighting of survey data

Initially, in order to check the quality of the tabulations, one may wish to check the output in unweighted form, using the raw data without any weights being attached. This approach is particularly useful when one is trying to track down those questionnaires which are producing "out of range" responses to a particular question, or responses to different questions that are inconsistent. Both these types of errors may be the result of a data entry error, perhaps involving a shift in codes across questions by the data entry operator, due to a missed entry or a double entry.

Once a clean (or at least acceptable) dataset is available, the actual table runs should be done using weighted data. These weights should reflect both the effects of the sample design and the level of response on the survey. The sampling weight will incorporate the inverses of the sampling fractions at each stage of sample selection. The non-response adjustment may be applied separately within each PSU, to bring the achieved sample up to its original intended level. Alternatively, if there is substantial non-response, it may be desirable to apply the corrections at a higher sampling level, so as to avoid the risk of possible biases that might arise from giving a large weight to an observation which does not in fact properly represent the characteristics of a small area. An alternative approach is to adjust the sample using updated external information (such as the sex-age distribution of the population from the population census or large national survey). In this way a sample which is known to match the known distribution is obtained.

APPENDIX 10.1

Suggested tabulations from a survey of occupational injuries

Estimates should be obtained for the whole country, by grossing up the sample results, using appropriate weights to take account of the sample design and the survey response. Estimates for jobs, hours actually worked, cases of injury, and days lost can be given separately for: a) all workers, b) employees and c) other workers.

Jobs

Total number of jobs held by workers in the last 12 months (i.e. total of all jobs held by each worker), by:

- age and sex
- occupation and sex
- economic activity (industry) and sex
- size of establishment and sex

Hours actually worked

Total hours worked in the last 12 months (total for all jobs, estimated for each job as the product of weeks actually worked and usual hours of work), by:

- age and sex
- occupation and sex
- economic activity (industry) and sex
- size of establishment and sex

Cases of injury

Number of cases of occupational injury during the last 12 months (separately and together for cases with temporary incapacity for work, cases with permanent incapacity for work, cases with restricted activity, and fatalities [calculated as the annual average over five years]), by:

- age and sex
- occupation and sex
- economic activity (industry) and sex
- size of establishment and sex
- location of accident and sex
- month of accident and sex

Number of non-fatal cases (together and separately for: cases with temporary incapacity, cases with permanent incapacity, and cases with restricted activity) by:

- type of injury and sex
- part of body injured and sex
- type of accident and sex
- material agency of injury and sex

Number of non-fatal cases notified to the responsible agency (such as the labour inspectorate of the ministry of labour), for cases with lost worktime and cases of restricted activity, by:

- economic activity (industry)
- size of establishment

Number of non-fatal cases for which compensation has been or is expected to be received, for cases with lost worktime and cases of restricted activity, by:

- economic activity (industry)
- size of establishment

Days lost

Total number of days lost for cases of temporary incapacity only during the last 12 months, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex
- size of establishment and sex
- type of injury and sex
- part of body injured and sex
- type of accident and sex
- material agency of injury and sex

Number of accidents

(See comment in text on method of calculation.)
Total number of occupational accidents during the last 12 months, by:

- economic activity (industry) and number of cases of injury
- size of establishment and number of cases of injury

Fatalities

Average number of fatalities due to occupational accidents, per year over the past five years, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex

APPENDIX 10.2

Tabulation of rates from the results of a survey of occupational injuries

To generate these tables, appropriate weighting factors should be applied, to take account of the sample design and the survey response.

Non-fatal injuries

Rates should be calculated separately for: a) all workers, b) employees and c) other workers.

Incidence rates

Rates of cases of non-fatal occupational injury per 100,000 workers employed, total, and for cases with lost worktime (temporary incapacity and permanent incapacity together and separately) and cases of restricted activity, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex

Frequency rates

Rates of non-fatal cases of occupational injury (all non-fatal cases, cases with lost worktime and cases with reduced activity) per 100,000 hours worked, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex

Severity rates

Rates of days lost by cases of temporary incapacity per 1,000,000 hours worked, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex

Average days lost

Average number of days lost per case of temporary incapacity, by:

- age and sex
- occupation and sex
- economic activity (industry) and sex

Fatalities

Incidence rates

Rates of fatal cases of occupational injury per 100,000 workers employed (using average fatalities per year), by:

- sex
- occupation
- economic activity (industry)

Frequency rates

Rates of fatal cases of occupational injury per 1,000,000 hours worked (using average fatalities per year), by:

- sex
- occupation
- economic activity (industry)

Presentation and dissemination of results 11

How to present occupational injury data

Occupational injury statistics have never been, and probably never will be, the "flavour of the month". The task of the data analyst is therefore to present the results of these surveys in as appealing a way as possible, so that some notice is taken of the results. Rates of injury by themselves are probably not very exciting to most people, though they are very useful for comparing the situation in countries of different size. It is recommended that both rates of injury and estimates of actual numbers of injuries and days lost are provided in the survey report, and highlighted equally, since the latter are likely to be more easily understood by the public.

There are likely to be several different potential users of the results: for instance, workers themselves, employers groups and the relevant government ministries. It may be necessary to package the results in slightly different ways, in order to appeal to the needs of each group. For example, small reports including interesting charts and graphics could be issued for selected industries or groups of workers, highlighting the occupations most at risk, and the types of accidents and injuries occurring most frequently. Particular attention should be paid to producing outputs that can be used by the media.

Confidentiality rules covering the disclosure of individual information must be respected when disseminating the survey results. For example, it should not be possible to identify a particular establishment or an individual person from the results, even by deduction from different cells.

Sharing ownership of survey results

Survey results should be published jointly by the statistics office and the ministry responsible for occupational safety. In that way, the key ministry will have a greater sense of ownership of the findings of the research. Results of the surveys should be presented to the public through publications, press releases, and by other means. One useful way of presenting the results is to place the key statistics on an appropriate web site.

If a technical advisory committee or group was established at the initial stage of the survey to plan operations, that committee can play a crucial role at the dissemination stage, since it will be representative of many different interests. Members of the committee will be able to offer advice on the best way to present the results of the survey, so that the results will have a maximum impact on the group of people that the person on the committee represents. That person should also play a key part in disseminating the results to the relevant interest group, by means of interviews and presentations.

Afterword

There are several topics and data items not shown in the model questionnaires that might be worth considering for surveys of occupational injuries.

In classifying workers, a distinction has been made according to the person's status in employment, but a possible variable that might be useful is whether the person is working full time or part time. It is possible, for instance, that part-time workers might be more prone to occupational injuries because they have less familiarity with operations in their workplace than do workers who perform the same tasks on a full-time basis.

One question that might be particularly relevant in the context of occupational injuries is to ask how long the person has been working in the job when the accident occurred. In rather the same way as for the full-time/part-time dichotomy, workers who have only just started working in a new job may be more prone to accidents, because they are unfamiliar with operations in the establishment.

The 16th ICLS also recommended that, as part of the extended data set, information should be collected on other factors that might have a bearing on the level of occupational injuries. For instance, it might be worth asking a question in the survey about the time of day when each accident occurred, since in some circumstances this might be an important contributing factor. Related to this is another factor that might have a bearing on the frequency of accidents: the length of time that the person has been doing this particular job without any significant break (say more than an hour).

Depending on the structure of the country's economy, it may be considered useful to collect information in the survey about the institutional sector in which the injured worker was engaged at the time of the occupational accident. In this case, the categories used would depend on the country's situation, but could include public sector and private sector.

In both the model establishment and household survey questionnaires, a question has been included asking about the location where the accident occurred. The types of codes offered as responses to this question are rather general in nature, but it might be considered useful to include a more detailed question about the type of site where the accident occurred: for example, whether it occurred on the street, in a workshop, on a construction site or in an office, and so on.

In the household survey questionnaire, the term "head of household" has been used, with advice to interviewers to record the relationship of each person to this head of household. However, in some societies the concept of head of household may be considered inappropriate. In such cases it may be more appropriate to ask the household to designate one person as the "reference person", and then to record the relationship of each person to this reference person.

The codes used for the "status in employment" question are those recommended in the International Classification of Status in Employment (ICSE-93), but countries may prefer to adapt the codes to their own needs, in line with the advice contained in ICSE-93.

In household surveys it is often necessary to collect information by means of a proxy, rather than directly from the person concerned. It would be well worth attempting to conduct a small research exercise, aimed at measuring what effect the use of proxies has on the quality of response.

More detailed data on the sequence of the accident, as set out in chapters 3 and 5, could be collected through household surveys, particularly in "stand-alone" surveys. These include information on the place of occurrence, work process, specific activity, material agency associated with specific activity, deviation resulting in the accident and material agency associated with deviation. At present, however, there are no internationally approved classification schemes relating to these variables, although work has been carried out by Eurostat for the purposes of statistics on occupational injuries in the countries of the European Union.[1]

[1] See annex 4.

Annexes

Resolution concerning statistics of occupational injuries (resulting from occupational accidents), adopted by the Sixteenth International Conference of Labour Statisticians (October 1998)

The Sixteenth International Conference of Labour Statisticians,

Recalling the resolution concerning statistics of occupational injuries adopted by the Thirteenth International Conference of Labour Statisticians (1982),

Recalling the Code of practice on the recording and notification of occupational accidents and diseases, approved by the Governing Body of the ILO at its 261st Session (November 1994),

Observing that the existing international standards on statistics of occupational injuries do not provide adequate guidance on the measurement and classification of occupational injuries,

Recognizing that statistics of occupational injuries should form part of a broad programme of statistics of occupational safety and health,

Recognizing that statistics of occupational injuries are essential for effective programmes for the prevention of occupational accidents, and for their monitoring,

Recognizing further that international guidelines on the measurement and classification of occupational injuries will promote the development of these statistics along sound lines and improve their international comparability;

Adopts this fifteenth day of October 1998 the following resolution:

General objectives and uses

1. Each country should aim to develop a comprehensive programme of statistics on occupational safety and health, including occupational diseases and occupational injuries. The objective of this programme would be to provide an adequate statistical base for the various users, taking into account the specific national needs and circumstances. One of the major components of the programme should comprise statistics on occupational injuries, which should be based on a range of sources of information, and which may be used in conjunction with other appropriate economic and social indicators.

2. This resolution aims to set out standards of good practice for the collection and presentation of statistics of occupational injuries as guidance for countries wishing to revise their existing statistical systems in this field, or establish new ones. Its provisions should not undermine any existing national systems, nor should they lead to duplication of effort.

3. The principal objective of the statistics is to provide comprehensive and timely information on occupational injuries for prevention purposes. The statistics may be used for a number of purposes, such as:

(a) to identify the occupations and economic activities where occupational injuries occur, along with their extent, severity and the way in which they occur, as a basis for planning preventive measures;

(b) to set priorities for preventive efforts;

(c) to detect changes in the pattern and occurrence of occupational injuries, so as to monitor improvements in safety and reveal any new areas of risk;

(d) to inform employers, employers' organizations, workers and workers' organizations of the risks associated with their work and workplaces, so that they can take an active part in their own safety;

(e) to evaluate the effectiveness of preventive measures;

(f) to estimate the consequences of occupational injuries, particularly in terms of days lost or costs;

(g) to provide a basis for policy-making aimed at encouraging employers, employers' organizations, workers and workers' organizations to introduce accident prevention measures;

(h) to assist in developing training material and programmes for accident prevention;

(i) to provide a basis for identifying possible areas for future research.

4. The major users of the statistics, including the representative organizations of employers and workers, should be consulted when the concepts, definitions and methodology for the collection, compilation and dissemination of the statistics are designed or revised, with a view to taking into account their needs and obtaining their cooperation.

Terms and definitions

5. For the purposes of statistics of occupational injuries, the following terms and definitions are used:

(a) occupational accident: an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work which results in one or more workers incurring a personal injury, disease or death; as occupational accidents are to be considered travel, transport or road traffic accidents in which workers are injured and which arise out of or in the course of work, i.e. while engaged in an economic activity, or at work, or carrying on the business of the employer;

(b) commuting accident: an accident occurring on the habitual route, in either direction, between the place of work or work-related training and:

(i) the worker's principal or secondary residence;

(ii) the place where the worker usually takes his or her meals; or

(iii) the place where he or she usually receives his or her remuneration;

which results in death or personal injury;

(c) occupational injury: any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity;

(d) case of occupational injury: the case of one worker incurring an occupational injury as a result of one occupational accident;

(e) incapacity for work: inability of the victim, due to an occupational injury, to perform the normal duties of work in the job or post occupied at the time of the occupational accident.

Coverage

6. The various sources of statistics should, where practical, cover all occupational injuries, as defined in paragraph 5, including non-fatal injuries causing an absence from work of at least one day, excluding the day of the accident, and fatal injuries. Where it is practical and considered relevant to include injuries resulting from commuting accidents, the information relating to them should be compiled and disseminated separately.

7. Where practical, the statistics should cover all workers regardless of their status in employment (for example, employee, employer and own-account worker). The coverage should include child workers,[1] informal sector workers and homeworkers, where they exist.

8. The statistics should in principle cover the whole country, all branches of economic activity and all sectors of the economy. A case of occupational injury occurring while a worker is outside the country of normal residence should be included in th statistics of the country within whose jurisdiction the accident took place.

Types of data

9. Countries should aim to collect the following types of information regarding cases of occupational injury:

(a) information about the enterprise, establishment or local unit:

(i) location;

(ii) economic activity;

(iii) size (number of workers);

(b) information about the person injured:

(i) sex;

(ii) age;

(iii) occupation;

(iv) status in employment;

(c) information about the injury:

(i) whether fatal or non-fatal;

(ii) type of injury;

(iii) part of body injured;

(d) information about the accident and its circumstances:

(i) type of location of the accident: such as the usual workplace, another place within the establishment, outside the premises of the establishment;

(ii) date and time of the accident;

(iii) mode of injury: how the person was injured by a physical contact with an item or object which caused the injury or was psychologically affected by an event; if there are several injuries, the mode of the most serious injury should be recorded;

[1] This inclusion should not be interpreted as condoning child labour.

(iv) material agency of injury: the item, agent, object or product associated with the injury, i.e. the physical tool, object, element, etc. with which the victim came into contact and was injured by; if there are several injuries, the material agency associated with the most serious injury should be recorded.

10. The programme of statistics can include studies to assess the value of further information as, for example, given below. Countries which thus find this or other information useful could continue to develop their programme of statistics further, especially for more serious cases of occupational injuries and fatalities.

(a) information about the injury:

(i) incapacity for work expressed in calendar days of absence from work;

(b) information about the accident and its circumstances:

(i) shift, start time of work of the injured person and hours worked in the activity when the accident occurred;

(ii) the total number of workers injured in the accident;

(iii) place of occurrence: the type of place where the accident occurred, such as a production or construction area, trade or service area, farm, street or highway;

(iv) work process in which the injured person was engaged when the accident occurred: the main type or kind of work being carried out by the victim during the period up to the accident (this is a subset of the tasks covered by the occupation of the victim), such as setting up machines, cleaning of working area, teaching;

(v) specific activity of the injured person at the time of the accident: the activity actually being carried out by the victim when the accident occurred; the duration of the activity may range from very short to long; it may or may not be associated with an item or object, such as feeding the machine, operating transport equipment, carrying loads;

(vi) material agency associated with the specific activity of the injured person: the tool, object, element, product, etc., used by the victim in the specific activity when the accident happened (this may not necessarily be implicated in the accident), such as floors, doors, hand tools, mobile cranes;

(vii) deviation which resulted in the accident: what occurred in an abnormal way, deviating from the normal way of working or the normal process, i.e. what went wrong, the event leading to the accident, such as breakage, loss of control of machine, fall of person, aggression; if there are several interlinked or successive events, the last one should be recorded;

(viii) material agency associated with the deviation: the tool, object, element, product, etc. linked with what occurred in an abnormal way, such as floors, doors, hand tools, mobile cranes.

11. Where injuries due to commuting accidents are covered, information corresponding to that provided for in paragraph 9 should be collected, as well as the following:

(a) place of accident;

(b) the injured person's mode of transport;

(c) the injured person's transport role;

(d) the mode of transport of the counterpart (if any).

Measurement

Occupational injury

12. The unit of observation should be the case of occupational injury, i.e. the case of one worker incurring an occupational injury as a result of one occupational accident. If a person is injured in more than one occupational accident during the reference period, each case of injury to that person should be counted separately. Recurrent absences due to an injury resulting from a single occupational accident should be treated as the continuation of the same case of occupational injury, not as new cases. Where more than one person is injured in a single accident, each case of occupational injury should be counted separately.

Fatal occupational injury

13. For measurement purposes, a fatal occupational injury is an occupational injury leading to death within one year of the day of the occupational accident.

Time lost due to occupational injuries

14. Time lost should be measured separately for each case of occupational injury leading to temporary incapacity for work of a maximum of one year. In order to assess the severity of the injury, time lost should be measured in terms of the number of calendar days during which the injured person is temporaril incapacitated, based on the information available at the time the statistics are compiled. If it is measured in workdays, attempts should be made to assess the total number of calendar days lost.

15. The time lost should be measured inclusively from the day after the day of the accident, to the day prior to the day of return to work. In the case of recurrent absences due to a single case of occupational injury, each period of absence should be measured as above, and the resulting number of days lost for each period summed to arrive at the total for the case of injury. Temporary absences from work of less than one day for medical treatment should not be included in time lost.

16. The time lost as a result of permanent incapacity for work or fatal occupational injuries may also be estimated. In these cases, the data should be compiled and disseminated separately from data relating to temporary incapacity for work.

Reference period and periodicity

17. For a given reference period, the statistics should relate to the number of cases of occupational injury occurring during the period and the total time lost as a result of those cases of injury. Cases of fatal injury should be included in the statistics for the reference period during which the occupational accident occurred.

18. The statistics should be compiled at least once a year for a reference period of not more than a year. Where seasonal trends may be considered to be important, the statistics may be compiled more frequently, using shorter reference periods, such as a month or a quarter.

Comparative measures

19. In order to permit meaningful comparisons of the statistics, for example between different periods, economic activities, regions and countries, account needs

to be taken of the differences in employment size, changes in the number of workers in the reference group, as well as in the hours worked by those in the reference group. A number of rates which take into account these differences may be calculated, including the following measures, which are among those most useful for comparing information at both the national and international levels. The term "workers in the reference group" refers to those workers in the particular group under consideration and covered by the source of the statistics of occupational injuries (for example those of a specific sex or in a specific economic activity, occupation, region, age group, or any combination of these, or those covered by a particular insurance scheme). For each of the measures below, the numerator and the denominator should have the same coverage. For example, if self-employed persons are covered in the statistics of occupational injuries they should also be covered in the denominator.

(a) The frequency rate of new cases of occupational injury:

$$\frac{\textbf{Number of new cases of occupational injury during the reference period x 1,000,000}}{\textbf{Total number of hours worked by workers in the reference group during the reference period}}$$

This may be calculated separately for fatal and non-fatal occupational injuries. Ideally, the denominator should be the number of hours actually worked by workers in the reference group. If this is not possible, it may be calculated on the basis of normal hours of work, taking into account entitlements to periods of paid absence from work, such as paid vacations, paid sick leave and public holidays.

(b) The incidence rate of new cases of occupational injury:

$$\frac{\textbf{Number of new cases of occupational injury during the reference period x 1,000}}{\textbf{Total number of workers in the reference group during the reference period}}$$

This may be calculated separately for fatal and non-fatal injuries. The number of workers in the reference group should be the average for the reference period. In calculating the average, account should be taken of the hours normally worked by those persons. The number of those working part time should be converted to full-time equivalents.

(c) The severity rate of new cases of occupational injury:

$$\frac{\textbf{Number of days lost as a result of new cases of occupational injury during the reference period x 1,000,000}}{\textbf{Total amount of time worked by workers in the reference group during the reference period}}$$

This should be calculated only for temporary incapacity for work. The amount of time worked by workers in the reference group should preferably be measured in hours worked.

(d) Days lost per new case of occupational injury:

Median or mean of the number of days lost for each new case of occupational injury during the reference period.

All the measures may be calculated according to economic activity, occupation, age group, etc., or any combination of these.

Dissemination

20. The statistics of occupational injuries that are compiled should be disseminated regularly, at least once a year; preliminary figures should be released no later than one year after the end of each reference period. The disseminated data should include time series, as well as the data for the most recent reference period. Any revisions to figures released in the past should be clearly indicated in newly disseminated data.

21. Detailed descriptions of the sources, concepts, definitions and methodology used in collecting and compiling the statistics on occupational injuries should be:
    (a) produced and updated to reflect significant changes;
    (b) disseminated by the competent body;
    (c) communicated to the ILO.

22. In order to promote the comparability of the statistics among countries whose national statistical practices do not conform closely to the international standards, the disseminated data should be accompanied by an explanation of any divergences from those standards.

23. Dissemination may take the form of printed publications, electronic data sets, etc. Where possible, the relevant competent authority should make data available on the Internet, so as to facilitate analysis by users throughout the world. The statistics should be disseminated in such a way that the disclosure of any information relating to an individual statistical unit, such as a person, household, an establishment or an enterprise is not possible, unless prior permission has been obtained from the individual units concerned.

24. Each year, countries should communicate to the ILO the statistics on occupational injuries (not including individual cases) requested for dissemination by the ILO in its Yearbook of Labour Statistics and other forms.

Sources of data

25. In compiling statistics of occupational injuries, various sources of information should be used in order to provide as full a picture as possible of the situation at a given point in time and to give an estimate of any under-reporting which may occur. For example, consideration could be given to periodically supplementing the information available from systems for the notification of compensation of occupational injuries by adding brief modules of questions to existing survey questionnaires, such as those used for establishment surveys for employment and wages, and for labour force surveys. In addition, the feasibility of developing new sources should be examined.

26. Where data from different sources are used together, attempts should be made to ensure that the concepts, definitions, coverage and classifications used by the different sources are consistent. To this end, it would be useful to establish a coordinating committee at the national level, comprising representatives of government, other producers of statistics on occupational injuries, and employers' and workers' organizations. In addition, efforts should be made to harmonize the statistics compiled from different sources and by different bodies.

Classification

27. The data should be classified at least according to major branch of economic activity and as far as possible according to other significant characteristics of persons injured, of enterprises or establishments, of occupational injuries and of occupational accidents for which information is collected in accordance with paragraph 9. Countries should attempt to use classifications that are either comparable with or can be related to the most recent versions of the relevant international classifications, where these exist. Annexes A to F provide the most recent versions of the international classifications below, up to the second level, where available. It may however be desirable, for accident prevention purposes, for countries to classify their data at a greater level of detail.

    International Standard Industrial Classification of All Economic Activities (ISIC), Revision 3 (1990).[2]

    Classification according to employment size of establishments, as in the

    International Recommendations for Industrial Statistics, Rev. 1 (1983).

    International Standard Classification of Occupations, ISCO-88.

    International Classification of Status in Employment, ICSE-93.

    Type of injury, from the International Statistical Classification of Diseases and Related Health Problems, ICD-10 (1992).

    Part of body injured, from the International Statistical Classification of Diseases and Related Health Problems, ICD-10 (1992).

    The ILO should develop and disseminate classifications to replace or supplement the existing schemes adopted by the Tenth ICLS in 1962 for the variables listed below:

    - type of location of the accident;
    - mode of injury;
    - material agency of injury.

28. The ILO should develop and disseminate classifications to replace or supplement the existing schemes adopted by the Tenth ICLS in 1962, for variables such as those given below. Furthermore, the ILO should encourage and help countries to develop their own classifications to give further information which they can use for their purposes.

    For occupational injuries:

    - place of occurrence;
    - work process;
    - specific activity;
    - deviation;
    - material agency associated with the specific activity or the deviation.

    For injuries due to commuting accidents:

    - place of accident;
    - injured person's mode of transport;
    - injured person's transport role;
    - mode of transport of counterpart.

[2] For full details, see United Nations, Statistical Papers, Series M, No. 4, Rev. 3 (New York, UN doc. ST/ESA/STAT/SER.M/4/Rev. 3, 1990).

Further action

29. The ILO should prepare a manual to provide technical guidance on the contents of this resolution. This manual should also cover the collection of information on occupational injuries in the informal sector and among child workers, the collection of information through household surveys and establishment surveys, the estimation of under-reporting and of costs of occupational injuries, the classifications to be developed as recommended in paragraphs 27 and 28, and how they should be applied, as well as the establishment of a mapping between ICD-10 and the classifications in Annexes E and F. It should also cooperate, as far as possible, with countries in the development of statistics of occupational injuries by providing technical assistance and training.

30. Other areas for future work by the ILO include:
    (a) developing standards for statistics of occupational diseases; and
    (b) making worldwide estimates of the number of fatal occupational injuries.

Annex A

Classification of economic activities International Standard Industrial Classification of All Economic Activities, Revision[3]

(tabulation categories and divisions)

Code	Designation
A	**Agriculture, hunting and forestry**
01	Agriculture, hunting and related service activities
02	Forestry, logging and related activities
B	**Fishing**
05	Fishing, operation of fish hatcheries and fish farms; service activities incidental to fishing
C	**Mining and quarrying**
10	Mining of coal and lignite; extraction of peat
11	Extraction of crude petroleum and natural gas; service activities incidental to oil and gas extraction, excluding surveying
12	Mining of uranium and thorium ores
13	Mining of metal ores
14	Other mining and quarrying
D	**Manufacturing**
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
21	Manufacture of paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products and nuclear fuel
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastics products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products, except machinery and equipment
29	Manufacture of machinery and equipment not elsewhere classified
30	Manufacture of office, accounting and computing machinery
31	Manufacture of electrical machinery and apparatus not elsewhere classified
32	Manufacture of radio, television and communications equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing, not elsewhere classified
37	Recycling
E	**Electricity, gas and water supply**
40	Electricity, gas, steam and hot-water supply
41	Collection, purification and distribution of water

[3] See http://unstats.un.org/unsd/cr/registry/isic-3.

F **Construction**
45 Construction

G **Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods**
50 Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel
51 Wholesale trade and commission trade, except of motor vehicles and motorcycles
52 Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods

H **Hotels and restaurants**
55 Hotels and restaurants

I **Transport, storage and communications**
60 Land transport; transport via pipelines
61 Water transport
62 Air transport
63 Supporting and auxiliary transport activities; activities of travel agencies
64 Post and telecommunications

J **Financial intermediation**
65 Financial intermediation, except insurance and pension funding
66 Insurance and pension funding, except compulsory social security
67 Activities auxiliary to financial intermediation

K **Real estate, renting and business activities**
70 Real estate activities
71 Renting of machinery and equipment without operator and of personal and household goods
72 Computer and related activities
73 Research and development
74 Other business activities

L **Public administration and defence; compulsory social security**
75 Public administration and defence; compulsory social security

M **Education**
80 Education

N **Health and social work**
85 Health and social work

O **Other community, social and personal service activities**
90 Sewage and refuse disposal, sanitation and similar activities
91 Activities of membership organizations, not elsewhere classified
92 Recreational, cultural and sporting activities
93 Other service activities

P **Private households with employed persons**
95 Private households with employed persons

Q **Extra-territorial organizations and bodies**
99 Extra-territorial organizations and bodies

Annex B

Classification according to size of enterprise, establishment or local unit

The following size classes, expressed in terms of the average number of persons engaged in the enterprise, establishment or local unit are based on those recommended for international comparisons in the 1983 World Programme of Industrial Statistics.[4] For national purposes, ranges should be established according to each country's circumstances and needs.

Code	Designation
A	1 to 4 persons engaged
B	5 to 9 persons engaged
C	10 to 19 persons engaged
D	20 to 49 persons engaged
E	50 to 99 persons engaged
F	100 to 149 persons engaged
G	150 to 199 persons engaged
H	200 to 249 persons engaged
I	250 to 499 persons engaged
J	500 to 999 persons engaged
K	1,000 or more persons engaged
Z	Size unknown

[4] For full details, see United Nations: *International Recommendations for Industrial Statistics,* Statistical Papers, Series M, No. 48, Rev. 1 (New York, UN doc. ST/ESA/STAT/SER.M/48/Rev. 1, 1983).

Annex C

Classification of occupations
International Standard Classification of Occupations, ISCO-88[5]
(major groups and sub-major groups)

Code	Designation
1	**Legislators, senior officials and managers**
11	Legislators and senior officials
12	Corporate managers
13	General managers
2	**Professionals**
21	Physical, mathematical and engineering science professionals
22	Life science and health professionals
23	Teaching professionals
24	Other professionals
3	**Technicians and associate professionals**
31	Physical and engineering science associate professionals
32	Life science and health associate professionals
33	Teaching associate professionals
34	Other associate professionals
4	**Clerks**
41	Office clerks
42	Customer services clerks
5	**Service workers and shop and market sales workers**
51	Personal and protective services workers
52	Models, salespersons and demonstrators
6	**Skilled agricultural and fishery workers**
61	Market-oriented skilled agricultural and fishery workers
62	Subsistence agricultural and fishery workers
7	**Craft and related trades workers**
71	Extraction and building trades workers
72	Metal, machinery and related trades workers
73	Precision, handicraft, printing and related trades workers
74	Other craft and related trades workers
8	**Plant and machine operators and assemblers**
81	Stationary plant and related operators
82	Machinery operators and assemblers
83	Drivers and mobile plant operators
9	**Elementary occupations**
91	Sales and services elementary occupations
92	Agricultural, fishery and related labourers
93	Labourers in mining, construction, manufacturing and transport
0	**Armed forces**
01	Armed forces

[5] For full details, see ILO International Standard Classification of Occupations: ISCO-88 (Geneva, 1990).

Annex D

Classification according to status in employment
International Classification of Status in Employment, ICSE-931

The following text is an extract from the resolution concerning the International Classification of Status in Employment (ICSE) adopted by the Fifteenth International Conference of Labour Statisticians (Geneva, 1993):

II. The ICSE-93 groups 2

4. The ICSE-93 consists of the following groups, which are defined in section III:

1. employees; among whom countries may need and be able to distinguish "employees with stable contracts" (including "regular employees");

2. employers;

3. own-account workers;

4. members of producers' cooperatives;

5. contributing family workers;

6. workers not classifiable by status.

III. Group definitions

5. The groups in the ICSE-93 are defined with reference to the distinction between "paid employment" jobs on the one side and "self employment" jobs on the other. Groups are defined with reference to one or more aspects of the economic risk and/or the type of authority which the explicit or implicit employment contract gives the incumbents or to which it subjects them.

6. Paid employment jobs are those jobs where the incumbents hold explicit (written or oral) or implicit employment contracts which give them a basic remuneration which is not directly dependent upon the revenue of the unit for which they work (this unit can be a corporation, a non-profit institution, a government unit or a household). Some or all of the tools, capital equipment, information systems and/or premises used by the incumbents may be owned by others, and the incumbents may work under direct supervision of, or according to strict guidelines set by the owner(s) or persons in the owner's employment. (Persons in "paid employment jobs" are typically remunerated by wages and salaries, but may be paid by commission from sales, by piece-rates, bonuses or in-kind payments such as food, housing or training.)

7. Self-employment jobs are those jobs where the remuneration is directly dependent upon the profits (or the potential for profits) derived from the goods and services produced (where own consumption is considered to be part of profits). The incumbents make the operational decisions affecting the enterprise, or delegate such decisions while retaining responsibility for the welfare of the enterprise. (In this context, "enterprise" includes one-person operations.)

8. 1. Employees are all those workers who hold the type of job defined as "paid employment jobs" (cf. paragraph 6). Employees with stable contracts are those "employees" who have had, and continue to have, an explicit (written or oral) or implicit contract of employment, or a succession of such contracts, with the same employer on a continuous basis. "On a continuous basis" implies a period of employment which is longer than a specified minimum determined according to national circumstances. (If interruptions are allowed in this minimum period, their maximum duration should also be determined according to national circumstances.)

Regular employees are those "employees with stable contracts" for whom the employing organization is responsible for payment of relevant taxes and social security contributions and/or where the contractual relationship is subject to national labour legislation.

9. 2. Employers are those workers who, working on their own account or with one or a few partners, hold the type of job defined as a "self-employment job" (cf. paragraph 7) and, in this capacity, on a continuous basis (including the reference period) have engaged one or more persons to work for them in their business as "employee(s)" (cf. paragraph 8). The meaning of "engage on continuous basis" is to be determined by national circumstances, in a way which is consistent with the definition of "employees with stable contracts" (cf. paragraph 8). (The partners may or may not be members of the same family or household.)

10. 3. Own-account workers are those workers who, working on their own account or with one or more partners, hold the type of job defined as a "self-employment job" (cf. paragraph 7), and have not engaged on a continuous basis any "employees" (cf. paragraph 8) to work for them during the reference period. It should be noted that, during the reference period, the members of this group may have engaged "employees", provided that this is on a non-continuous basis. (The partners may or may not be members of the same family or household.)

11. 4. Members of producers' cooperatives are workers who hold "self-employment" jobs (cf. paragraph 7) in a cooperative producing goods and services, in which each member takes part on an equal footing with other members in determining the organization of production, sales and/or other work of the establishment, the investments and the distribution of the proceeds of the establishment amongst their members. (It should be noted that "employees" (cf. paragraph 8) of producers' cooperatives are not to be classified to this group.)

12. 5. Contributing family workers are those workers who hold "self-employment" jobs (cf. paragraph 7) in a market-oriented establishment operated by a related person living in the same household, who cannot be regarded as partners, because their degree of commitment to the operation of the establishment, in terms of working time or other factors to be determined by national circumstances, is not at a level comparable to that of the head of the establishment. (Where it is customary for young persons, in particular, to work without pay in an economic enterprise operated by a related person who does not live in the same household, the requirement of "living in the same household" may be eliminated.)

13. 6. Workers not classifiable by status include those for whom insufficient relevant information is available, and/or who cannot be included in any of the preceding categories.

Annex E

Classification according to type of injury

The following classification is based on the International Statistical Classification of Diseases and Related Health Problems, ICD-10.[6] The most serious injury or disease sustained or suffered by the victim should be classified. Where several injuries have been incurred, the most serious one should be classified. The coding given below does not correspond to that given in ICD-10, due to differences in structure.

Code	Designation
1	**Superficial injuries and open wounds**
1.01	Superficial injuries (including abrasions, blisters (non-thermal), contusions, puncture wounds (without major open wounds), insect bites (non-venomous)
1.02	Open wounds (including cuts, lacerations, puncture wounds (with penetrating foreign body), animal bites)
2	**Fractures**
2.01	Closed fractures
2.02	Open fractures
2.03	Other fractures (dislocated, displaced)
3	**Dislocations, sprains and strains** (Including avulsions, lacerations, sprains, strains, traumatic haemarthroses, ruptures, subluxations and tears of joints and ligaments)
3.01	Dislocations and subluxations
3.02	Sprains and strains
4	**Traumatic amputations** (Including traumatic enucleation of the eye)
5	**Concussion and internal injuries** (Including blast injuries, bruises, concussion, crushing, lacerations, traumatic haematoma, punctures, ruptures and tears of internal organs)
6	**Burns, corrosions, scalds and frostbite**
6.01	Burns (thermal) (including from electrical heating appliances, electricity, flames, friction, hot air and hot gases, hot objects, lightning, radiation)
6.02	Chemical burns (corrosions)
6.03	Scalds
6.04	Frostbite
7	**Acute poisonings and infections**
7.01	Acute poisonings (acute effects of the injection, ingestion, absorption or inhalation of toxic, corrosive or caustic substances; including toxic effects of contact with venomous animals)
7.02	Infections (including intestinal infectious diseases, specified zoonoses, protozoal diseases, viral diseases, mycoses)
8	**Other specified types of injury**
8.01	Effects of radiation
8.02	Effects of heat and light
8.03	Hypothermia
8.04	Effects of air pressure and water pressure
8.05	Asphyxiation
8.06	Effects of maltreatment (including physical abuse, psychological abuse)
8.07	Effects of lightning (shock from lightning, struck by lightning not otherwise specified)

[6] For full details, see WHO International Statistical Classification of Diseases and Related Health Problems, ICD 10 (Geneva, 1992).

8.08 Drowning and non-fatal submersion
8.09 Effects of noise and vibration (including acute hearing loss)
8.10 Effects of electric current (electrocution, shock from electric current)
8.19 Other specified injuries

10 Type of injury, unspecified

Annex F

Classification according to the part of body injured

The following classification is based on the International Statistical Classification of Diseases and Related Health Problems, ICD-10.[7] The groups relating to multiple locations should be used only to classify cases where the victim suffers from several injuries to different parts of the body and no injury is obviously more severe than the others. In order to designate the side of the body injured, a further digit may be added to the code for the part of body injured, where relevant, as follows:

1: right side
2: left side
3: both sides

The coding given below does not correspond to that given in the ICD-10, due to differences in structure.

Code Designation

1 Head
1.1 Scalp, skull, brain and cranial nerves and vessels
1.2 Ear(s)
1.3 Eye(s)
1.4 Tooth, teeth
1.5 Other specified parts of facial area
1.7 Head, multiple sites affected
1.8 Head, other specified parts not elsewhere classified
1.9 Head, unspecified

2 Neck, including spine and vertebrae in the neck
2.1 Spine and vertebrae
2.8 Neck, other specified parts not elsewhere classified
2.9 Neck, unspecified

3 Back, including spine and vertebrae in the back
3.1 Spine and vertebrae
3.8 Back, other specified parts not elsewhere classified
3.9 Back, unspecified

4 Trunk and internal organs
4.1 Rib cage (ribs including sternum and shoulder blades)
4.2 Other parts of thorax, including internal organs
4.3 Pelvic and abdominal area, including internal organs
4.4 External genitalia
4.7 Trunk, multiple sites affected
4.8 Trunk, other specified parts not elsewhere classified
4.9 Trunk and internal organs, unspecified

[7] Op. cit.

5	**Upper extremities**
5.1	Shoulder and shoulder joints
5.2	Arm, including elbow
5.3	Wrist
5.4	Hand
5.5	Thumb
5.6	Other finger(s)
5.7	Upper extremities, multiple sites affected
5.8	Upper extremities, other specified parts not elsewhere classified
5.9	Upper extremities, unspecified
6	**Lower extremities**
6.1	Hip and hip joint
6.2	Leg, including knee
6.3	Ankle
6.4	Foot
6.5	Toe(s)
6.7	Lower extremities, multiple sites affected
6.8	Lower extremities, other specified parts not elsewhere classified
6.9	Lower extremities, unspecified
7	**Whole body and multiple sites**
7.1	Systemic effect (for example, from poisoning or infection)
7.8	Multiple sites of the body affected
9	**Other parts of body injured**
10	**Part of body injured, unspecified**

ILO Conventions and Recommendations on occupational safety and health

Guiding policies for action

- Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) and Recommendation, 2006 (No. 197).
- List of Occupational Diseases Recommendation, 2002 (No. 194)
- Occupational Safety and Health Convention, 1981 (No. 155) and Recommendation, 1981 (No. 164).
- Protocol of 2002 to the Occupational Safety and Health Convention, 1981.
- Occupational Health Services Convention, 1985 (No. 161) and Recommendation, 1985 (No. 171).
- Working Environment Convention, 1977 (No. 148) and Recommendation, 1977 (No. 156).

Protection in given branches of economic activity

- Safety and Health in Agriculture Convention, 2001 (No. 184) and Recommendation (No. 192)
- The Safety and Health in Construction Convention, 1988 (No. 167) and Recommendation (No. 175).
- The Safety and Health in Mines Convention, 1995 (No. 176) and Recommendation (No. 183).
- Hygiene (Commerce and Offices) Convention, 1964 (No. 120).
- Safety Provisions (Building) Convention, 1937 (No. 62) and Recommendation, 1937 (No. 53).
- Marking of Weight (packages Transported by Vessels) Convention, 1929 (No. 27).
- Protection against Accidents (Dockers) Convention, 1929 (No. 28) and Convention (Revised), 1932 (No. 32).
- Occupational Safety and Health (Dock Work) Convention, 1979 (152) and Recommendation, 1979 (No. 160).
- Plantations Convention, 1958 (No. 110).

Protection against specific risks

- Chemicals Convention, 1990 (No. 170) and Recommendation (No. 177).
- Prevention of Major Industrial Accidents Convention, 1993 (No. 174) and Recommendation 1993 (No. 181).
- Asbestos Convention, 1986 (No. 162) and Recommendation (No. 172).
- Anthrax Prevention Recommendation, 1919 (No. 3).
- White Lead (Painting) Convention, 1921 (No. 13).
- Radiation Protection Convention, 1960 (No. 115) and Recommendation, 1960 (No. 114).
- Benzene Convention, 1971 (No. 136) and Recommendation, 1971 (No. 144).
- Occupational Cancer Convention, 1974 (No. 139) and Recommendation, 1974 (No. 147).
- Guarding of Machinery Convention, 1963 (No. 119) and Recommendation, 1963 (No. 118).

Labour inspection

- Labour Inspection (Health Services) Recommendation, 1919 (No. 5).
- Labour Inspection Recommendation, 1923, (No. 20).
- Labour Inspection (Seamen) Recommendation, 1926 (No. 28).
- Labour Inspection Convention, 1947, (No. 81) and Recommendation, 1947 (No. 81).
- Protocol of 1995 to the Labour Inspection Convention, 1947, (No. 81).
- Labour Inspection (Mining and Transport) Recommendation, 1947 (No. 82).
- Labour Inspection (Agriculture) Convention, 1969 (No. 129) and Recommendation, 1969, (No. 133).
- Labour Inspection (Seafarers) Convention, 1996 (No. 178) and Recommendation, 1996 (No. 185).

Measures of protection

- Maximum Weight Convention, 1967 (No. 127) and Recommendation, 1967 (No. 128).
- Maternity Protection Convention, 1919 (No. 3).

  Maternity Protection Convention (Revised), 1952 (No. 103).

  Maternity Protection Convention, 2000 (No. 183) and Recommendation, 2000 (No. 191).

  Night Work (Women) Convention (Revised), 1948 (No. 89).

  Night Work (Women) Protocol, 1990.

  Underground Work (Women) Convention, 1935 (No. 45).
- Minimum Age Convention 1973 (No. 138).

  Night Work of Young Persons (Non-Industrial Occupations) Convention, 1946 (No. 79).

  Night Work of Young Persons (Industry) Convention (Revised), 1948 (No. 90).

  Medical Examination of Young Persons (Industry) Convention, 1946 (No. 77).

  Medical Examination of Young Persons (Non-Industrial Occupations) Convention, 1946 (No. 78).

  Medical Examination of Young Persons (Underground Work) Convention, 1965 (No. 124).
- Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143).

Statistics

- Labour Statistics Convention, 1985 (No. 160) and Recommendation, 1985 (No. 170).

Labour Statistics Convention, 1985 (No. 160) and Recommendation, 1985 (No. 170) (extracts)

Labour Statistics Convention, 1985 (No. 160)

The General Conference of the International Labour Organization,

Having been convened at Geneva by the Governing Body of the International Labour Office, and having met in its Seventy-first Session on 7 June 1985, and

Having decided upon the adoption of certain proposals with regard to the revision of the Convention concerning Statistics of Wages and Hours of Work, 1938 (No. 63), which is the fifth item on the agenda of the session, and

Considering that these proposals should take the form of an international Convention,

adopts this twenty-fifth day of June of the year one thousand nine hundred and eighty-five the following Convention, which may be cited as the Labour Statistics Convention, 1985:

I. GENERAL PROVISIONS

Article 1

Each Member which ratifies this Convention undertakes that it will regularly collect, compile and publish basic labour statistics, which shall be progressively expanded in accordance with its resources to cover the following subjects:

(a) economically active population, employment, where relevant unemployment, and where possible visible underemployment;

(b) structure and distribution of the economically active population, for detailed analysis and to serve as benchmark data;

(c) average earnings and hours of work (hours actually worked or hours paid for) and, where appropriate, time rates of wages and normal hours of work;

(d) wage structure and distribution;

(e) labour cost;

(f) consumer price indices;

(g) household expenditure or, where appropriate, family expenditure and, where possible, household income or, where appropriate, family income;

(h) occupational injuries and, as far as possible, occupational diseases; and

(i) industrial disputes.

Article 2

In designing or revising the concepts, definitions and methodology used in the collection, compilation and publication of the statistics required under this Convention, Members shall take into consideration the latest standards and guidelines established under the auspices of the International Labour Organisation.

Article 3
In designing or revising the concepts, definitions and methodology used in the collection, compilation and publication of the statistics required under this Convention, the representative organisations of employers and workers, where they exist, shall be consulted with a view to taking into account their needs and to ensuring their co-operation.

Article 4
Nothing in this Convention shall impose an obligation to publish or reveal data which could result in the disclosure in any way of information relating to an individual statistical unit, such as a person, a household, an establishment or an enterprise.

Article 5
Each Member which ratifies this Convention undertakes to communicate to the International Labour Office, as soon as practicable, the published statistics compiled in pursuance of the Convention and information concerning their publication, in particular -

(a) the reference information appropriate to the means of dissemination used (titles and reference numbers in the case of printed publications and the equivalent descriptions in the case of data disseminated in other forms); and

(b) the most recent dates or periods for which the different types of statistics are available, and the dates of their publication or release.

Article 6
Detailed descriptions of the sources, concepts, definitions and methodology used in collecting and compiling statistics in pursuance of this Convention shall be -

(a) produced and updated to reflect significant changes;

(b) communicated to the International Labour Office as soon as practicable; and

(c) published by the competent national body.

II. BASIC LABOUR STATISTICS
...

Article 14
1. Statistics of occupational injuries shall be compiled in such a way as to be representative of the country as a whole, covering, where possible, all branches of economic activity.

2. As far as possible, statistics of occupational diseases shall be compiled covering all branches of economic activity, and in such a way as to be representative of the country as a whole.
...

III. ACCEPTANCE OF OBLIGATIONS

Article 16
1. Each Member which ratifies this Convention shall, in pursuance of the general obligations referred to in Part I, accept the obligations of the Convention in respect of one or more of the Articles of Part II.

2. Each Member shall specify in its ratification the Article or Articles of Part II in respect of which it accepts the obligations of this Convention.

3. Each Member which has ratified this Convention may subsequently notify the Director-General of the International Labour Office that it accepts the obligations of the Convention in respect of one or more of the Articles of Part II which were not already specified in its ratification. These notifications shall have the force of ratification as from the date of their communication.

4. Each Member which has ratified this Convention shall state, in its reports on the application of the Convention submitted under article 22 of the Constitution of the International Labour Organisation, the position of its law and practice on the subjects covered by the Articles of Part II in respect of which it has not accepted the obligations of the Convention and the extent to which effect is given or is proposed to be given to the Convention in respect of such subjects.

Article 17
1. A Member may limit initially the scope of the statistics referred to in the Article or Articles of Part II in respect of which it has accepted the obligations of this Convention to specified categories of workers, sectors of the economy, branches of economic activity or geographical areas.

2. Each Member which limits the scope of the statistics in pursuance of paragraph 1 of this Article shall indicate in its first report on the application of the Convention submitted under article 22 of the Constitution of the International Labour Organisation, the Article or Articles of

Part II to which the limitation applies, stating the nature of and reasons for such limitation, and shall state in subsequent reports the extent to which it has been possible or it is proposed to extend the scope to other categories of workers, sectors of the economy, branches of economic activity or geographical areas.

3. After consulting the representative organisations of employers and workers concerned, a Member may, by a declaration communicated to the Director-General of the International Labour Office in the month following each anniversary of the coming into force of the Convention, introduce subsequent limitations on the technical scope of the statistics covered by the Article or Articles of Part II in respect of which it has accepted the obligations of the Convention. Such declarations shall take effect one year after the date on which they are registered. Each Member which introduces such limitations shall provide in its reports on the application of the Convention submitted under article 22 of the Constitution of the International Labour Organisation the particulars referred to in paragraph 2 of this Article.

...

Labour Statistics Recommendation, 1985 (No. 170)

The General Conference of the International Labour Organization,

Having been convened at Geneva by the Governing Body of the International Labour Office, and having met in its Seventy-first Session on 7 June 1985, and

Recognizing the need for reliable labour statistics both in developed and in developing countries, particularly for the purposes of planning and monitoring social and economic progress, as well as for industrial relations,

Having decided upon the adoption of certain proposals with regard to the revision of the Convention concerning Statistics of Wages and Hours of Work, 1938 (No. 63), which is the fifth item on the agenda of the session, and

Having determined that these proposals shall take the form of a Recommendation supplementing the Labour Statistics Convention, 1985, adopts this twenty-fifth day of June of the year one thousand nine hundred and eighty-five, the following Recommendation, which may be cited as the Labour Statistics Recommendation, 1985:

I. BASIC LABOUR STATISTICS

...

Statistics of Occupational Injuries and Occupational Diseases

12.
(1) Statistics of occupational injuries should be compiled at least once a year.

(2) These statistics should be classified at least according to branch of economic activity and, as far as possible, according to significant characteristics of employees (such as sex, age group and occupation or occupational group or level of qualifications) and of establishments.

13.
(1) As far as possible, statistics of occupational diseases should be compiled at least once a year.

(2) These statistics should be classified at least according to branch of economic activity and, as far as possible, according to significant characteristics of employees (such as sex, age group and occupation or occupational group or level of qualifications) and of establishments.

...

II. STATISTICAL INFRASTRUCTURE

16. For the purposes of collecting and compiling the labour statistics in pursuance of Part I of this Recommendation, Members should progressively develop the appropriate national statistical infrastructure. The major elements of such an infrastructure should include -

(a) a comprehensive and up-to-date register of establishments or enterprises for the purposes of surveys or censuses; such a register should be sufficiently detailed to permit the selection of samples of establishments or enterprises;

(b) a coordinated system for the implementation of surveys or censuses of establishments or enterprises;

(c) a capability for the implementation of a continuous and coordinated series of national surveys of households or individuals; and

(d) access for statistical purposes, with appropriate safeguards for their confidential use, to administrative records (such as those of employment services, social security bodies, labour inspection services).

17. Members should establish appropriate national standard classifications, and should encourage and co-ordinate the observance as far as possible of these classifications by all bodies concerned.

18. Members should take the necessary steps to harmonize the statistics compiled in pursuance of this Recommendation from different sources and by different bodies.

19.
(1) In designing or revising the concepts, definitions and methodology used in the collection, compilation and publication of the statistics provided for in this Recommendation, Members should take into consideration the international recommendations on labour statistics established under the auspices of the International Labour Organization, and relevant recommendations of other competent international organizations.

(2) Members should review and, if appropriate, revise or update the concepts, definitions and classifications used in compiling labour statistics in pursuance of this Recommendation when the relevant international standards and guide-lines are revised, or when new ones are established.

20. In designing or revising the concepts, definitions and methodology used in the collection, compilation and publication of the statistics provided for in the Labour Statistics Convention, 1985, and in this Recommendation, Members might seek assistance from the International Labour Office.

ANNEX 4

Additional classifications

The following classification schemes have been developed by Eurostat (the Statistical Office of the European Communities) for use in the project European Statistics on Accidents at Work (ESAW). More information on these classifications is available on the following web site: http://forum.europa.eu.int/Members/irc/dsis/hasaw/library?l=/statisstics_methodology/esaw_methodology/ke4202569_en_pdf/_EN_1.0_&a=d

Variable: **Working Environment**
Classification: **ESAW classification system**
Format: **Numeric**
No. of characters **2 positions on 3 digits**

Code	Label
000	**No information**
010	**Industrial site – not specified**
011	Production area, factory, workshop
012	Maintenance area, repair workshop
013	Area used principally for storage, loading, unloading
019	Other group 010 type Working Environments not listed above
020	**Construction site, construction, opencast quarry, opencast mine – not specified**
021	Construction site – building being constructed
022	Construction site – building being demolished, repaired, maintained
023	Opencast quarry, opencast mine, excavation, trench (including opencast mines and working quarries)
024	Construction site – underground
025	Construction site – on/over water
026	Construction site – in a high-pressure environment
029	Other group 020 type Working Environments not listed above
030	**Farming, breeding, fish farming, forest zone – not specified**
031	Breeding area
032	Farming area – ground crop
033	Farming area – tree or bush crop
034	Forestry zone
035	Fish farming zone, fishing, aquaculture (not on a vessel)
036	Garden, park, botanical garden, zoological garden
039	Other group 030 type Working Environments not listed above

040 Tertiary activity area, office, amusement area, miscellaneous – not specified
041 Office, meeting room, library etc.
042 Teaching establishment, school, secondary school, college, university, crèche, day nursery
043 Small or large sales area (including street commerce)
044 Restaurant, recreational area, temporary accommodation (including museums, auditoriums, stadiums, fairs etc.)
049 Other group 040 type Working Environments not listed above

050 Health establishment – not specified
051 Health establishment, private hospital, hospital, nursing home
059 Other group 050 type Working Environments not listed above

060 Public area – not specified
061 Area permanently open to public thoroughfare – (highways, byways, parking areas, station or airport waiting rooms etc.)
062 Means of transport – by land or rail – private or public (all kinds: train, bus, car etc.)
063 Zone attached to public places but with access restricted to authorized personnel: railway line, airport apron, motorway hard shoulder
069 Other group 060 type Working Environments not listed above

070 In the home – not specified
071 Private home
072 Communal parts of a building, annexes, private family garden
079 Other group 070 type Working Environments not listed above

080 Sports area – not specified
081 Indoor sports area – sports hall, gymnasium, indoor swimming pool
082 Outdoor sports area – sports ground, outdoor swimming pool, skiing piste
089 Other group 080 type Working Environments not listed above

090 In the air, elevated, excluding construction sites – not specified
091 Elevated – on a fixed level (roof, terrace, etc.)
092 Elevated – mast, pylon, suspended platform
093 In the air – aboard aircraft
099 Other group 090 type Working Environments not listed above, excluding construction sites

100 Underground, excluding construction sites – not specified
101 Underground – tunnel (road, train, tube)
102 Underground – mine
103 Underground – drains/sewers
109 Other group 100 type Working Environments not listed above, excluding construction sites

110 On/over water, excluding construction sites – not specified
111 Sea or ocean – aboard all types of vessels, platforms, ships, boats, barges
112 Lake, river, harbour – aboard all types of vessels, platforms, ships, boats, barges
119 Other group 110 type Working Environments not listed above, excluding construction sites

120 In high pressure environments, excluding construction sites – not specified
121 In a high pressure environment – underwater (e.g. diving)
122 In a high pressure environment – chamber
129 Other group 120 type Working Environments not listed above, excluding construction site

999 Other Working Environments not listed in the classification

Variable: **Working Process**
Classification: **ESAW classification system**
Format: **Numeric**
No. of characters **2**

The "Working Process" variable describes the basic type of work (the broad, general task) being performed by the victim at the time of the accident. The Working Process, i.e. the main task being performed at the time and location of the accident, need not necessarily be linked with the victim's Specific Physical Activity at the moment the accident occurs. The Working Process presupposes a certain duration.

Code Label

00 No information

10 Production, manufacturing, processing, storing – all types – not specified
11 Production, manufacturing, processing – all types
12 Storing – all types
19 Other group 10 type Working Processes not listed above

20 Excavation, Construction, Repair, Demolition – not specified
21 Excavation
22 New construction – building
23 New construction – civil engineering, infrastructures, roads, bridges, dams, ports
24 Re-modelling, repairing, extending, building maintenance – all types of constructions
25 Demolition – all types of construction
29 Other group 20 type Working Processes not listed above

30 Agricultural type work, forestry, horticulture, fish farming, work with live animals – not specified
31 Agricultural type work – working the land
32 Agricultural type work – with vegetables, horticultural
33 Agricultural type work – with live animals
34 Forestry type work
35 Fish farming, fishing
39 Other group 30 type Working Processes not listed above

40 Service provided to enterprise and/or to the general public; intellectual activity – not specified
41 Service, care, assistance, to the general public
42 Intellectual work – teaching, training, data processing, office work, organizing, managing
43 Commercial activity – buying, selling and associated services
49 Other group 40 type Working Processes not listed above

50 Other work related to tasks coded under 10, 20, 30 and 40 – not specified
51 Setting up, preparation, installation, mounting, disassembling, dismantling
52 Maintenance, repair, tuning, adjustment
53 Cleaning working areas, machines – industrial or manual
54 Waste management, disposal, waste treatment of all kinds
55 Monitoring, inspection of manufacturing procedures, working areas, means of transport, equipment – with or without monitoring equipment
59 Other group 50 type Working Processes not listed above

60 Movement, sport, artistic activity – not specified
61 Movement, including aboard means of transport
62 Sport, artistic activity
69 Other group 60 type Working Processes not listed above

99 Other Working Processes not listed in the above classification

Variable: **Specific Physical Activity**
Classification: **ESAW classification system**
Format: **Numeric**
No. of characters **2**

Code Label

00 **No information**

10 **Operating machine – not specified**
11 Starting the machine, stopping the machine
12 Feeding the machine, unloading the machine
13 Monitoring the machine, operating or driving the machine,
19 Other group 10 type Specific Physical Activities not listed above

20 **Working with hand-held tools – not specified**
21 Working with hand-held tools – manual
22 Working with hand-held tools – motorized
29 Other group 20 type Specific Physical Activities not listed above

30 **Driving/being on board a means of transport or handling equipment – not specified**
31 Driving a means of transport or handling equipment – mobile and motorized
32 Driving a means of transport or handling equipment – mobile and non-motorized
33 Being a passenger on board a means of transport
39 Other group 30 type Specific Physical Activities not listed above

40 **Handling of objects – not specified**
41 Manually taking hold of, grasping, seizing, holding, placing – on a horizontal level
42 Tying, binding, tearing off, undoing, squeezing, unscrewing, screwing, turning
43 Fastening, hanging up, raising, putting up – on a vertical level
44 Throwing, flinging away
45 Opening, closing (box, package, parcel)
46 Pouring, pouring into, filling up, watering, spraying, emptying, baling out
47 Opening (a drawer), pushing (a warehouse/office /cupboard door)
49 Other group 40 type Specific Physical Activities not listed above

50 **Carrying by hand – not specified**
51 Carrying vertically – lifting, raising, lowering an object
52 Carrying horizontally – pulling, pushing, rolling an object
53 Transporting a load – carried by a person
59 Other group 50 type Specific Physical Activities not listed above

60 **Movement – not specified**
61 Walking, running, going up, going down, etc.
62 Getting in or out
63 Jumping, hopping, etc.
64 Crawling, climbing, etc.
65 Getting up, sitting down
66 Swimming, diving
67 Movements on the spot
69 Other group 60 type Specific Physical Activities not listed above

70 **Presence – not specified**

99 **Other Specific Physical Activities not listed in this classification**

Variable: **Deviation**
Classification: **ESAW classification system**
Format: **Numeric**
No. of characters **2**

Code Label

00 **No information**

10 **Deviation due to electrical problems, explosion, fire – not specified**
11 Electrical problem due to equipment failure – leading to indirect contact
12 Electrical problem – leading to direct contact
13 Explosion
14 Fire, flare up
19 Other group 10 type Deviations not listed above

20 **Deviation by overflow, overturn, leak, flow, vaporization, emission – not specified**
21 Solid state – overflowing, overturning
22 Liquid state – leaking, oozing, flowing, splashing, spraying
23 Gaseous state – vaporization, aerosol formation, gas formation
24 Pulverulent material – smoke generation, dust/particles in suspension/emission of
29 Other group 20 type Deviations not listed above

30 **Breakage, bursting, splitting, slipping, fall, collapse of Material Agent – not specified**
31 Breakage of material – at joint, at seams
32 Breakage, bursting – causing splinters (wood, glass, metal, stone, plastic, others)
33 Slip, fall, collapse of Material Agent – from above (falling on the victim)
34 Slip, fall, collapse of Material Agent – from below (dragging the victim down)
35 Slip, fall, collapse of Material Agent – on the same level
39 Other group 30 type Deviations not listed above

40 **Loss of control (total or partial) of machine, means of transport or handling equipment, handheld tool, object, animal – not specified**
41 Loss of control (total or partial) – of machine (including unwanted start-up) or of the material being worked by the machine
42 Loss of control (total or partial) – of means of transport or handling equipment, (motorized or not)
43 Loss of control (total or partial) – of hand-held tool (motorized or not) or of the material being worked by the tool
44 Loss of control (total or partial) – of object (being carried, moved, handled, etc.)
45 Loss of control (total or partial) – of animal
49 Other group 40 type Deviations not listed above

50 **Slipping, stumbling and falling, fall of persons – not specified**
51 Fall of person – to a lower level
52 Slipping – stumbling and falling – fall of person – on the same level
59 Other group 50 type Deviations not listed above

60 **Body movement without any physical stress (generally leading to an external injury) – not specified**
61 Walking on a sharp object
62 Kneeling on, sitting on, leaning against
63 Being caught or carried away, by something or by momentum
64 Uncoordinated movements, spurious or untimely actions
69 Other group 60 type Deviations not listed above

70 **Body movement under or with physical stress (generally leading to an internal injury) – not specified**
71 Lifting, carrying, standing up
72 Pushing, pulling

73 Putting down, bending down
74 Twisting, turning
75 Treading badly, twisting leg or ankle, slipping without falling
79 Other group 70 type Deviations not listed above

80 Shock, fright, violence, aggression, threat, presence – not specified
81 Shock, fright
82 Violence, aggression, threat – between company employees subjected to the employer's authority
83 Violence, aggression, threat – from people external to the company towards victims performing their duties (bank hold-up, bus drivers, etc.)
84 Aggression, jostle – by animal
85 Presence of the victim or of a third person in itself creating a danger for oneself and possibly others
89 Other group 80 type Deviations not listed above

99 Other Deviations not listed above in this classification

Variable: **Material Agent**
Classification: **ESAW classification system**
Format: **Numeric**
No. of characters **2 positions with 2 digits = 4 digits**

Classification structure (1-position codes)

Code Label

00.00 No material agent or no information

01.00 Buildings, structures, surfaces – at ground level (indoor or outdoor, fixed or mobile, temporary or not) – not specified

02.00 Buildings, structures, surfaces – above ground level (indoor or outdoor) – not specified

03.00 Buildings, structures, surfaces – below ground level (indoor or outdoor) – not specified

04.00 Systems for the supply and distribution of materials, pipe networks – not specified

05.00 Motors, systems for energy transmission and storage – not specified

06.00 Hand tools, not powered – not specified

07.00 Hand-held or hand-guided tools, mechanical – not specified

08.00 Hand tools – without specification of power source – not specified

09.00 Machines and equipment – portable or mobile – not specified

10.00 Machines and equipment – fixed – not specified

11.00 Conveying, transport and storage systems – not specified

12.00 Land vehicles – not specified

13.00 Other transport vehicles- not specified

14.00 Materials, objects, products, machine components, debris, dust – not specified

15.00 Chemical, explosive, radioactive, biological substances – not specified

16.00 Safety devices and equipment – not specified

17.00 Office equipment, personal equipment, sports equipment, weapons, domestic appliances – not specified

18.00 Living organisms and human-beings – not specified

19.00 Bulk waste – not specified

20.00 Physical phenomena and natural elements – not specified

99.00 Other material agents not listed in this classification

Training materials for household surveys and establishment surveys

Statistics of Occupational Injuries

STATISTICS OF OCCUPATIONAL INJURIES

Why do we want information about occupational injuries?

- **to prevent them happening:**
  - **to identify occupations and economic activities where occupational accidents occur**
  - **to set priorities for preventive efforts**
  - **to detect changes in patterns and occurrences**
  - **to inform employers and workers of risks associated with their work and workplaces**
  - **to evaluate effectiveness of preventive measures**

What is an occupational injury?

- **Any personal injury, disease or death resulting from an occupational accident**

[distinct from an occupational disease: a disease contracted as a result of exposure over a period of time to risk factors arising from work activity]

What is an occupational accident?

- **An unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work, which results in one or more workers incurring a personal injury, disease or death**

[includes travel, transport and road traffic accidents in which workers are injured and which arise out of or in the course of work]

How does an accident happen?

- Something goes wrong - a "deviant" event occurs - often with an associated item, object or material
  - **"type of accident"**

e.g. explosion
fall
lost control of machine

How was the person injured?

- The action led to an injury - often caused by an associated item, object or material
  - **MODE OF INJURY AND AGENT OF INJURY**

e.g. struck by moving object - car
fall (from height) - floor
crushed - machine
contact with sharp object - knife

What were the consequences of the accident?

- The person received an injury to a part of his/her body
  - **TYPE OF INJURY AND PART OF BODY INJURED**

e.g. fracture - leg
burn - hand
amputation - finger
concussion - head

International Labour Office 07

What were the consequences of the injury?

- received first aid, but continued working normally → no incapacity to work or restricted activity
- received treatment and continued working, but his/her work activity was restricted → restricted activity, but not incapacitated
- was temporarily unable to work → temporary incapacity to work / lost work days
- was permanently unable to work again → permanent incapacity to work
- died → fatality

International Labour Office 08

What were the consequences of the injury?

Cases not covered in project

- received first aid, but continued working normally → no incapacity to work or restricted activity

International Labour Office 09

What were the consequences of the injury?

Cases covered in the project

- received treatment and continued working, but his/her work activity was restricted → restricted activity, but not incapacitated
- was temporarily unable to work → temporary incapacity to work / lost work days
- was permanently unable to work again → permanent incapacity to work
- died → fatality

International Labour Office 10

What is "restricted activity"?

- A worker was injured in an occupational accident. He/she received some kind of treatment for the injury and was then able to continue working, without losing any days of work. However, his/her work activity was restricted because of the injury, so that he/she:
  - had to take on another job on a temporary basis, or
  - could only work part of the time in his/her usual job, or
  - worked full-time in his/her usual job, but could not carry out in the normal way all the tasks or functions assigned to the job

International Labour Office 11

What is "temporary incapacity to work"?

- A worker was injured in an occupational accident. He/she received some kind of treatment for the injury. He/she was not able to work for at least one day following the day of the accident. However, he/she was able to return to work when the injury had healed sufficiently, to the same job or a job with similar tasks.
- The worker may still be absent from work at the time of the survey. If he/she expects to be able to return to work once the injury has healed, this is also a case of temporary incapacity.

International Labour Office 12

What is "permanent incapacity to work"?

- A worker was injured in an occupational accident. He/she received some kind of treatment for the injury. He/she was not able to work for at least one day following the day of the accident. In addition, the consequences of the injury meant that he/she was not able to return to the same or a similar job that he/she was doing at the time of the accident.
- If the worker is still absent from work at the time of the survey, and does not expect to be able to perform again all the tasks of his/her old job, this is also a case of permanent incapacity.

What is a fatal occupational injury?

- A worker was injured in an occupational accident, and died as a result of the injury.
- Death may have been immediate or very soon after the accident.
- However, the person may have received treatment (may even have returned to work for some time), but later died as a consequence of the injury. This is also a fatal case of occupational injury. In such cases, the death should occur within 12 months of the occupational accident.

Basic information to be collected

For each case of occupational injury

- information about enterprise, establishment or local unit:
  - economic activity, size
- information about person injured:
  - sex, age, occupation, status in employment
- information about injury:
  - fatal/non-fatal, temporary/permanent incapacity/restricted activity, days lost, type of injury, part of body injured
- information about accident and circumstances:
  - type of location, date, mode of injury, material agency of injury

What do we want to do with the information?

Comparative measures will be calculated *for each economic activity and occupation, separately for men and women - for fatal and non/fatal cases, for cases of permanent/temporary incapacity and cases of restricted activity*

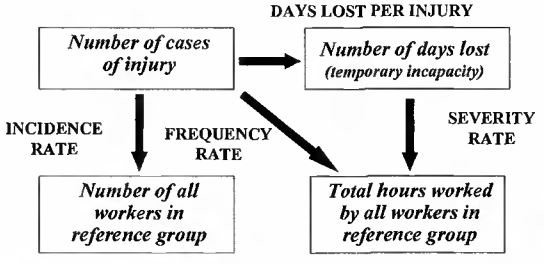
- Frequency rate:
  - cases of injury during reference period in relation to total hours worked by workers in reference group during reference period
- Incidence rate:
  - cases of injury during reference period in relation to total number of workers in reference group during reference period

What do we want to do with the information?

Calculate for cases of temporary incapacity only:

- Severity rate:
  - days lost as a result of cases of injury during reference period in relation to total amount of time worked (preferably hours worked) by workers in reference group during reference period
- Days lost per injury:
  - median or mean number of days lost for cases of injury during reference period

What do we need to be able to calculate these measures?



Classifications: Case Studies

STATISTICS OF OCCUPATIONAL INJURIES

CLASSIFICATIONS: *CASE STUDIES*

Classifications

Coding as usual for:

- ECONOMIC ACTIVITY
- OCCUPATIONAL GROUP
- STATUS IN EMPLOYMENT

Classifications for:

- NUMBER OF PEOPLE WORKING IN THE ESTABLISHMENT (*household module only*)
- TYPE OF LOCATION OF ACCIDENT
- PART OF BODY INJURED
- TYPE OF INJURY
- MODE OF INJURY
- AGENT OF INJURY

NUMBER OF PEOPLE WORKING IN THE ESTABLISHMENT

Include all people working at the time of the accident, including the employer, contributing family workers, casual workers, etc.

A person working alone on his/her own account is a one-person establishment.

Codes:

1. **1 to 4 people**
2. **5 to 9 people**
3. **10 to 49 people**
4. **50 people or more**
5. **Not known**

TYPE OF LOCATION OF ACCIDENT

The physical location where the accident happened.

Codes:

1. **In your usual work area in the establishment/ unit** *(n.b. whole farm or holding is usual work area for agricultural workers)*
2. **Somewhere else in the establishment/unit**
3. **In your usual work area away from the establishment or no fixed work area** *(use this code for street vendors, shoe-shiners, taxi drivers, etc.)*

TYPE OF LOCATION OF ACCIDENT

4. **On work-related travel** *(NOT commuting accidents) (e.g. travelling to or from a meeting in another establishment, travelling to or from another city for business purposes). This code should not be used for travelling salespersons, etc.*
5. **Somewhere else** *(use this code only if you cannot use codes 1 to 4; provide a brief description of the nature of the location where the accident took place)*
6. **Not known** *(only use this code if a proxy respondent does not know the type of location of the accident)*

PART OF BODY INJURED

The part of the body injured as a result of the accident.

Use one code only.

If several parts of the body were injured, identify and code the site that received the most serious injury (i.e. that had the most impact on the worker's capacity to work).

If two or more parts of the body were equally affected, use code 7 (multiple sites) (e.g. bones broken in both a hand and a foot, burns to legs and back).

PART OF BODY INJURED

Codes:

1. **Head** *(skull, brain, ears, eyes, teeth and other parts of the head)*
2. **Neck** *(spine and vertebrae in the neck)*
3. **Back** *(spine and vertebrae in the back)*
4. **Trunk or internal organs** *(rib cage, shoulder blades, internal organs, pelvis, abdomen, genitals and the trunk itself)*

PART OF BODY INJURED

5. **Upper extremities** *(shoulders, shoulder joints, arms, elbows, wrists, hands, thumbs and other fingers)*
6. **Lower extremities** *(hips, hip joints, legs, knees, ankles, feet and toes)*
7. **Whole body or multiple sites** *(either the whole body was injured, or several different parts of the body were injured with equal severity)*
8. **Not known** *(only use this code if a proxy respondent does not know which part of the body was injured)*

TYPE OF INJURY

The type of injury received, corresponding to the part of body injured as a result of the accident.

Use one code only.

If several injuries were incurred, identify and code the most serious one (i.e. that had the most impact on the worker's capacity to work). This will correspond to the part of body injured.

N.B. It is the injury incurred at the time of the accident that should be recorded, not any subsequent conditions

TYPE OF INJURY

Codes:

1. **Superficial injuries and open wounds** *(abrasions, blisters [not from heat], bruises, puncture wounds, insect bites [not poisonous], animal bites, cuts and lacerations)*
2. **Fractures**
3. **Dislocations, sprains, strains**
4. **Amputations**
5. **Concussion, internal injuries** *(concussion, blast injuries, crushing, and lacerations, punctures and ruptures of internal organs)*

TYPE OF INJURY

6. **Burns, corrosions, scalds, frostbite** *(burns from electricity and electrical appliances, flames, friction, hot air, hot gases, hot objects, lightning, radiation, chemical burns, scalds and frostbite)*
7. **Acute poisoning or infections** *(acute effects of the injection [including poisonous insect, fish or snake bite] swallowing or absorption or breathing in of poisonous, corrosive or caustic substances, intestinal infectious diseases and viral diseases)*

TYPE OF INJURY

8. **Other injuries** *(injuries that do not fit clearly into codes 1 to 7; e.g. effects of radiation or heat or light, hypothermia, effects of air pressure and water pressure, asphyxiation, effects of drowning and non-fatal submersion, effects of noise and vibration; give a brief description of the injury - this is very important)*
9. **Not known** *(only use this code if a proxy respondent does not know the type of injury incurred)*

MODE OF INJURY - HOW INJURY WAS INCURRED

What happened to cause the injury.

Use one code only, to describe the action that led to the most serious injury.

Codes 01 to 04 - action causing injury involved non-mechanical elements

Codes 05 to 09 - action involved mechanical elements

Code 10 - action involved overloading the body physically or mentally

MODE OF INJURY - HOW INJURY WAS INCURRED

Code 11 - animals or other human beings caused the injury

Code 12 - accidents where the action cannot be assigned to codes 01 to 11.

Explanation of codes:

01. **Contact with electric voltage** *(the person come into contact with electricity, and received an electric shock or burn; e.g. by touching an exposed wire)*

MODE OF INJURY

02. **Contact with extreme temperature** *(the person experienced extreme heat or extreme cold [e.g. causing frostbite]; not necessarily through physical contact with an object or touching something [e.g. extreme heat near a furnace, extreme cold in a freezing compartment])*
03. **Contact with hazardous substance** *(the person come into contact with some kind of chemical or biological substance [gas, liquid, solid, powder], that may have been inhaled through the nose or mouth [e.g. fumes, gas, dust], or ingested by eating or drinking, or was exposed to [e.g. sploshed] and suffered through eye or skin contact with it)*

MODE OF INJURY

04. **Drowning, buried** *(the person was prevented from taking in oxygen by immersion in a liquid, or buried under or enveloped by a substance [solid or gas])*
05. **Fell or crashed into something** *(the person was moving either horizontally [on the same level] or vertically [up or down] and object causing the injury (onto which the person fell or crashed) was stationary)*
06. **Struck by something** *(the person was stationary and the object was moving; e.g. flying through the air, falling from a height, running or rolling along the ground, suspended and swinging like a pendulum, or on a spring)*

MODE OF INJURY

07. **Collided with something** *(both the person and the object were moving, in the same or opposite directions)*
08. **Came into contact with sharp/pointed/rough/coarse element** *(neither the person nor the object were in motion; the person was injured because a knife or tool slipped, etc.)*
09. **Trapped, crushed** *(the person was caught in or squeezed by something movable, or squashed under something or crushed between objects; it was the force [weight, size, pressure, speed] of the object that caused the injury)*

MODE OF INJURY

10. **Suffered acute overloading of body** *(the person suffered severe overloading of muscles, joints, and organs or tissue due to excessive turning movements, external physical agents (noise, radiation, friction) or trauma [shock])*
11. **Received kick, bite** *(the person was bitten, hit or kicked by a human being or animal, or stung by a poisonous insect or fish)*

MODE OF INJURY

12. **Other reason** *(only use this code if the action causing the injury cannot be assigned to any of codes 01 to 11; explain briefly the action that caused the injury)*
13. **Not known** *(only use this code if a proxy respondent does not know how the injury was incurred)*

AGENT OF INJURY

The object or agent that caused the injury.

Use one code only, for the agent that caused the most serious injury.

N.B. Some injuries may not have been caused by an agent (e.g. strains, ruptured ligaments, etc.) - use code 11

Code 01 - used mainly for accidents where the person fell or bumped into something

Codes 02 to 06 - accidents where injuries were caused by devices or where the device malfunctioned

AGENT OF INJURY

Codes 07 to 09 - accidents where the person came into contact with, or was crushed or buried by materials, chemicals, objects, animals, etc.

Code 10 - accidents where the agent cannot be clearly coded under 01 to 09

Code 11 - accidents where no agent was involved

AGENT OF INJURY

Explanation of codes:

01. **Buildings, structures** *(all types of buildings, scaffolding, other structures, including ladders, harnesses, drilling platforms, excavation trenches, walls, partitions, underground galleries, floors, roads, the ground, bridges)*
02. **Prime movers (engines, etc.)** *(all types of engines, motors, electrical transformers, generators, power transmission systems)*
03. **Distribution systems** *(all means of distributing matter - stationary or movable pipes for distributing gas, liquids, solid matter; drains and sewers)*

AGENT OF INJURY

04. **Hand tools** *(electric or manually powered tools that are held or guided by hand; e.g. tools for sawing, cutting, riveting, welding, drilling, painting, cooking, sewing)*
05. **Machines and equipment** *(all types of machines and equipment, including machine tools; they may be portable, mobile or stationary; e.g. for extraction, working the soil, pressing, planing, treating, assembling, gluing)*
06. **Conveying, transporting, packaging equipment or vehicles** *(all means of conveying, transporting, packaging and stockpiling; e.g. conveyer belts, lifts, cranes, forklift trucks, storage tanks, land, sea and air vehicles of all types, pallets, skips, boxes)*

AGENT OF INJURY

07. Materials, objects *(all materials or objects or separate parts of machines; e.g. a car tyre, screw, bolt, load suspended on a hoisting device, agricultural products)*

08. Chemical substances *(may be solid, powder, liquid or gas; may be caustic, corrosive, harmful, toxic, flammable, explosive, radioactive, biological)*

09. Humans, animals, plants, etc. *(humans, other animals, insects, snakes, micro-organisms, trees, plants)*

AGENT OF INJURY

10. Other *(use this code for any other agent that cannot be assigned to codes 01 to 09, e.g. natural disaster (flood, earthquake, tidal wave, volcano) or some other natural element (e.g. rain, mud, hail storm; give a brief description of the agency or element causing the injury)*

11. None *(use this code if the injury was not caused by an agent but by a bad movement, such as twisting or straining.*

12. Not known *(only use this code if a proxy respondent does not know which agent caused the injury)*

CASE 1

At a construction site, while carrying a tool up a staircase, a bricklayer treads on a nail sticking out of a piece of wood that was left lying around. The nail pierces his foot.

LOCATION OF ACCIDENT Case 1

3 at person's usual work area away from the establishment

PART OF BODY INJURED

6 lower extremity (foot)

TYPE OF INJURY

1 superficial injury

HOW THE INJURY WAS INCURRED

08 came into contact with (trod on) sharp object

AGENT/ITEM CAUSING INJURY

07 materials/objects (nail)

CASE 2

In a factory, the nurse from the first aid room is walking across the factory floor when the rope holding a suspended load breaks. The load falls on the nurse's head, resulting in concussion.

LOCATION OF ACCIDENT Case 2

2 somewhere else in the establishment

PART OF BODY INJURED

1 head

TYPE OF INJURY

5 concussion

HOW THE INJURY WAS INCURRED

06 struck by something (swinging load)

AGENT/ITEM CAUSING INJURY

07 materials/objects (load)

CASE 3

In the cutting section of a sawmill, an unskilled labourer is feeding a motorized saw. A piece of wood is thrown back at him by the saw blade as it begins the sawing. The wood hits him in the face, knocking out an eye.

LOCATION OF ACCIDENT Case 3

1 usual work area in the establishment

PART OF BODY INJURED

1 head (eye)

TYPE OF INJURY

4 amputation (loss of eye)

HOW THE INJURY WAS INCURRED

06 struck by something

AGENT/ITEM CAUSING INJURY

07 materials/objects (piece of wood)

CASE 4

In an office block, a maintenance worker climbs onto a roof to check something. He trips over a broken tile and falls from the roof onto a balcony situated below. He suffers a number of injuries, the most serious being a broken arm and a broken leg.

LOCATION OF ACCIDENT Case 4

3 no fixed work area

PART OF BODY INJURED

7 multiple sites (arm and leg)

TYPE OF INJURY

2 fracture

HOW THE INJURY WAS INCURRED

05 fell onto something

AGENT/ITEM CAUSING INJURY

01 buildings, structures (balcony)

CASE 5

A lift maintenance worker is sent to a private block of flats. He climbs on top of the lift and sits on it to carry out maintenance work. He starts the lift by mistake, and his legs are crushed by it.

LOCATION OF ACCIDENT Case 5

3 no fixed work area

PART OF BODY INJURED

6 lower extremities (legs)

TYPE OF INJURY

5 concussion, internal injury (crushing)

HOW THE INJURY WAS INCURRED

09 trapped, crushed

AGENT/ITEM CAUSING INJURY

06 conveying, transport, etc. equipment or vehicles (lift)

CASE 6

A lorry driver is delivering a load of bricks. He stops the lorry at the side of the road on a steep hill to adjust the load, and, while he is unfastening the tailgate, the breaks fail. The lorry rolls back, knocks him over. As he falls, he breaks his arm. He also hits his head on a stone, cutting his scalp.

LOCATION OF ACCIDENT Case 6

3 no fixed work area

PART OF BODY INJURED

5 upper extremities (arm - more serious injury than cut scalp)

TYPE OF INJURY

2 fracture (more serious than cut)

HOW THE INJURY WAS INCURRED

05 fell onto something

AGENT/ITEM CAUSING INJURY

01 buildings, structures (road)

CASE 7

A woman works as cashier in shop. Two armed men carry out a hold-up. They make her open the safe, at gun-point, and steal the contents. While making their getaway, the woman struggles with them and tries to stop them. One of them shoots her, and she is hit in the stomach.

LOCATION OF ACCIDENT Case 7

1 usual work area in the establishment

PART OF BODY INJURED

4 trunk or internal organs (abdomen and internal organs)

TYPE OF INJURY

5 internal injury (puncture of internal organs by bullet)

HOW THE INJURY WAS INCURRED

06 struck by something (bullet)

AGENT/ITEM CAUSING INJURY

07 material, object (bullet)

CASE 8

A nurse in a hospital is disposing of a syringe in the waste-box. She mishandles it, and sticks the syringe needle into her thumb.

LOCATION OF ACCIDENT Case 8

1 usual work area in the establishment

PART OF BODY INJURED

4 upper extremities (thumb)

TYPE OF INJURY

1 superficial injury (puncture wound)

HOW THE INJURY WAS INCURRED

08 came into contact with sharp element (syringe needle)

AGENT/ITEM CAUSING INJURY

07 material, object (syringe needle)

CASE 8

N.B. The nurse may later contract an illness due to some kind of virus or bacteria in the syringe. However, it is the injury caused by the syringe needle that should be recorded.

CASE 9

In a warehouse, during an inspection by an officer from the fire department, a fire extinguisher pressurizes accidentally, so that the top shoots off. The handle of the fire extinguisher hits the officer in the face, breaking his nose.

Case 9

LOCATION OF ACCIDENT
3 usual work area away from the establishment
PART OF BODY INJURED
1 head (nose)
TYPE OF INJURY
2 fracture
HOW THE INJURY WAS INCURRED
06 struck by something (flying handle)
AGENT/ITEM CAUSING INJURY
07 material, object (handle of fire extinguisher)

CASE 10

A woman raises chickens in the yard next to her home. She sells the eggs at the local market. While going into the yard to feed the chickens, she trips over one of them and falls onto an old rusted bucket, which gashes her leg.

Case 10

LOCATION OF ACCIDENT
1 usual work area in the establishment
PART OF BODY INJURED
6 lower extremities (leg)
TYPE OF INJURY
1 superficial injuries (cut)
HOW THE INJURY WAS INCURRED
05 fell or crashed into something (fell)
AGENT/ITEM CAUSING INJURY
07 materials, objects (bucket)

CASE 11

In an office, a clerk bends down and picks up a heavy box of files. In doing so, she strains her back.

LOCATION OF ACCIDENT Case 11

1 usual work area in the establishment

PART OF BODY INJURED

3 back

TYPE OF INJURY

3 dislocation, sprain, strain (strain)

HOW THE INJURY WAS INCURRED

10 suffered acute overloading of body (lifting load)

AGENT/ITEM CAUSING INJURY

11 none

CASE 12

A street vendor is preparing some food to cook and then sell. He starts up a small paraffin stove to cook the food. The stove explodes, shooting burning paraffin over his chest. He suffers severe burns to his chest and hands, trying to put out the flames.

LOCATION OF ACCIDENT Case 12

3 no fixed work area

PART OF BODY INJURED

7 multiple sites (hands and chest)

TYPE OF INJURY

6 burns, corrosion, scald, frostbite (burns)

HOW THE INJURY WAS INCURRED

03 contact with extreme temperature (burning paraffin)

AGENT/ITEM CAUSING INJURY

08 chemical substances (flammable liquid)

CASE 13

An enumerator is visiting a house in a rural area to conduct an interview for the National Integrated Survey of Households. He is invited into the house by the head of the family. As he enters, a dog belonging to the household runs up to him and bites him on the leg.

LOCATION OF ACCIDENT Case 13

3 no fixed work area

PART OF BODY INJURED

6 lower extremities (leg)

TYPE OF INJURY

1 superficial injury (bite)

HOW THE INJURY WAS INCURRED

11 received kick, bite

AGENT/ITEM CAUSING INJURY

09 humans, animal, plants, etc. (dog)

CASE 14

A bus driver is driving his bus on his normal route when a pig rushes into the road in front of him. He swerves the bus to avoid the pig, and the bus skids off the road into a ditch. The driver is thrown through the windscreen of the bus, receiving cuts to his face and neck, and lands on a small wall, breaking several ribs.

Case 14

LOCATION OF ACCIDENT

3 no fixed work area

PART OF BODY INJURED

4 trunk or internal organs (ribs)

TYPE OF INJURY

2 fracture (more serious than cuts)

HOW THE INJURY WAS INCURRED

05 fell or crashed into something

AGENT/ITEM CAUSING INJURY

01 buildings, structures (wall)

CASE 15

A self-employed businessman travels from Lagos to Abuja to negotiate an important deal. After his meetings, on the way to the airport in Abuja the taxi he is riding in collides with a lorry. The official is thrown forwards against the back of the driver's seat, puts out his hands to save himself, and dislocates his right shoulder.

Case 15

LOCATION OF ACCIDENT

4 on work-related travel

PART OF BODY INJURED

5 upper extremities (shoulder joint)

TYPE OF INJURY

3 dislocation, sprain, strain (dislocation)

HOW THE INJURY WAS INCURRED

05 fell or crashed into something

AGENT/ITEM CAUSING INJURY

06 conveying, transport, etc. equipment, vehicles (car interior)

CASE 16

A woman is working at home, washing her husband's clothes. She spills some water on the floor, and slips on it. She hits her arm against a wall, and breaks the elbow.

Case 16

THIS IS NOT A CASE OF OCCUPATIONAL INJURY AS THE WOMAN WAS NOT ENGAGED IN AN ECONOMIC ACTIVITY AT THE TIME OF THE ACCIDENT, BUT WAS CARRYING OUT HOUSEHOLD CHORES.

CASE 17

A girl aged 12 years and her young brother are gathering firewood for their family home. The girl reaches out to pick up a fallen branch when a venomous snake darts forward from under the branch and bites her on the wrist.

LOCATION OF ACCIDENT

3 no fixed work area

PART OF BODY INJURED

5 upper extremities (wrist)

TYPE OF INJURY

7 acute poisoning or infection (venomous snake bite)

HOW THE INJURY WAS INCURRED

11 received kick, bite

AGENT/ITEM CAUSING INJURY

09 humans, animals, plants, etc. (snake)

ANNEX 6

Some guidance for recording and notification of occupational injuries

This annex includes extracts from ILO instruments and guidelines aimed at providing countries with advice on the way occupational injuries are recorded and notified to the appropriate national authorities, followed by the forms used to notify occupational injuries in Ontario, Canada and the United Kingdom as examples of national practices. Methodological information about national systems for notifying occupational injuries is contained in Sources and Methods: Labour Statistics, Volume 8 – Occupational injuries (ILO, Geneva, 1999) and published on the ILO's statistical web site (http://laborsta.ilo.org).

Protocol of 2002 to the Occupational Safety and Health Convention, 1981 (No. 155)

II. SYSTEMS FOR RECORDING AND NOTIFICATION

Article 2

The competent authority shall, by laws or regulations or any other method consistent with national conditions and practice, and in consultation with the most representative organizations of employers and workers, establish and periodically review requirements and procedures for:

(a) the recording of occupational accidents, occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases; and

(b) the notification of occupational accidents, occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases.

Article 3

The requirements and procedures for recording shall determine:

(a) the responsibility of employers:

(i) to record occupational accidents, occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases;

(ii) to provide appropriate information to workers and their representatives concerning the recording system;

(iii) to ensure appropriate maintenance of these records and their use for the establishment of preventive measures; and

(iv) to refrain from instituting retaliatory or disciplinary measures against a worker for reporting an occupational accident, occupational disease, dangerous occurrence, commuting accident or suspected case of occupational disease;

(b) the information to be recorded;

(c) the duration for maintaining these records; and

(d) measures to ensure the confidentiality of personal and medical data in the employer's possession, in accordance with national laws and regulations, conditions and practice.

Article 4

The requirements and procedures for the notification shall determine:

(a) the responsibility of employers:

(i) to notify the competent authorities or other designated bodies of occupational accidents, occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases; and

(ii) to provide appropriate information to workers and their representatives concerning the notified cases;

(b) where appropriate, arrangements for notification of occupational accidents and occupational diseases by insurance institutions, occupational health services, medical practitioners and other bodies directly concerned;

(c) the criteria according to which occupational accidents, occupational diseases and, as appropriate, dangerous occurrences, commuting accidents and suspected cases of occupational diseases are to be notified; and

(d) the time limits for notification.

Article 5

The notification shall include data on:

(a) the enterprise, establishment and employer;

(b) if applicable, the injured persons and the nature of the injuries or disease; and

(c) the workplace, the circumstances of the accident or the dangerous occurrence and, in the case of an occupational disease, the circumstances of the exposure to health hazards.

III. NATIONAL STATISTICS

Article 6

Each Member which ratifies this Protocol shall, based on the notifications and other available information, publish annually statistics that are compiled in such a way as to be representative of the country as a whole, concerning occupational accidents, occupational diseases and, as appropriate, dangerous occurrences and commuting accidents, as well as the analyses thereof.

Article 7

The statistics shall be established following classification schemes that are compatible with the latest relevant international schemes established under the auspices of the International Labour Organization or other competent international organizations.

List of Occupational Diseases Recommendation, 2002 (No. 194)

1. In the establishment, review and application of systems for the recording and notification of occupational accidents and diseases, the competent authority should take account of the 1996 Code of practice on the recording and notification of occupational accidents and diseases, and other codes of practice or guides relating to this subject that are approved in the future by the International Labour Organization.

6.3. Notification of occupational accidents

6.3.1. General

6.3.1.1. All occupational accidents should be notified, as required by national laws or regulations, to the competent authority, the labour inspectorate, the appropriate insurance institution or any other body:

(a) immediately after reporting of an occupational accident causing loss of life;

(b) within a prescribed time for other occupational accidents.

6.3.1.2. Notification should be made within such time as may be specified, and in prescribed specific forms, such as:

(a) an accident report for the labour inspectorate;

(b) a compensation report for the insurance institution;

(c) a report for the statistics-producing body; or

(d) a single form which contains all essential data for all bodies.

6.3.2. Minimum information

6.3.2.1. With a view to meeting the requirements of labour inspectorates, insurance institutions and the statistics-producing body, the forms prescribed in either a specific or single format should include at least the following information:

(a) enterprise, establishment and employer:

(i) name and address of the employer, and his or her telephone and fax numbers (if available);

(ii) name and address of the enterprise;

(iii) name and address of the establishment (if different);

(iv) economic activity of the establishment; and

(v) number of workers (size of the establishment);

(b) injured person:

(i) name, address, sex and age;

(ii) employment status;

(iii) occupation;

(c) injury:

(i) fatal accident;

(ii) non-fatal accident;

(iii) nature of the injury (e.g. fracture, etc.);

(iv) location of the injury (e.g. leg, etc.);

(d) accident and its sequence:

(i) geographical location of the place of the accident (usual workplace, another workplace within the establishment or outside the establishment);

(ii) date and time;

(iii) action leading to injury – type of accident (e.g. fall, etc.);

(iv) agency related to the accident (e.g. ladder, etc.).

6.3.2.2. For commuting accidents, the relevant necessary information to be notified should be specified.

6.3.3. More detailed information

6.3.3.1. National laws or regulations should provide for the specification of more detailed information, which should include the following:

(a) enterprise, establishment and employer:

(i) name and address of the employer, and his or her telephone and fax numbers (if available);

(ii) name and address of the enterprise;

(iii) name and address of the establishment (if different);

(iv) economic activity of the establishment; and

(v) number of workers (size of the establishment);

(b) injured person:

(i) name, address, sex and date of birth;

(ii) employment status;

(iii) occupation;

(iv) length of service for present employer;

(c) injury:

(i) fatal accident;

(ii) non-fatal accident;

(iii) nature of the injury (e.g. fracture, etc.);

(iv) location of the injury (e.g. leg, etc.);

(v) incapacity for work in calendar days;

(d) accident and its sequence:

(i) geographical location of the place of the accident (usual workplace, another workplace within the establishment or outside the establishment);

(ii) date and time;

(iii) shift, start time of work of the injured person and hours worked in the activity in which the accident occurred;

(iv) work environment (e.g. workshop area, office, road, etc.);

(v) work process (e.g. welding, maintenance, manual transport, etc.);

(vi) activity of the injured person at time of the accident (e.g. welding, maintaining press, operating machine, driving, walking, etc.);

(vii) item or items associated with activity of the injured person (e.g. machine, tool, power press, vehicle, etc.);

(viii) action leading to injury – type of accident (e.g. fall, etc.);

(ix) agency related to injury (e.g. ladder, etc.).

6.3.3.2. For commuting accidents, the relevant necessary information to be notified should be specified.

Workplace Safety and Insurance Board (WSIB), Canada: Employer's Report of Injury/Disease (Form 7)

WSIB ONTARIO CSPAAT

Mail To:
200 Front Street West
Toronto ON M5V 3J1

OR Fax To:
416-344-4684
OR 1-888-313-7373

Please PRINT in black ink

7 Employer's Report of Injury/Disease (Form 7)

Claim Number

A. Worker Information

Job Title/Occupation (at the time of accident/illness - do not use abbreviations)

Length of time in this position while working for you

Social Insurance Number

Please check **if** this worker is a: ☐ executive ☐ elected official ☐ owner ☐ spouse or relative of the employer

Last Name | First Name

Address (number, street, apt., suite, unit)

City/Town | Province | Postal Code

Is the worker covered by a Union/Collective Agreement? ☐ yes ☐ no

Worker Reference Number

Worker's preferred language ☐ English ☐ French ☐ Other

Date of Birth dd mm yy

Telephone ( )

Sex ☐ M ☐ F

Date of Hire dd mm yy

B. Employer Information

Fold here for #10 envelope

Trade and Legal Name (if different provide both)

Check one: ☐ Firm Number **OR** ☐ Account Number | Provide Number

Mailing Address

Rate Group Number

Classification Unit Code

City/Town | Province | Postal Code | Telephone ( )

Description of Business Activity

Does your firm have 20 or more workers? ☐ yes ☐ no

FAX Number ( )

Branch Address where worker is based (if different from mailing address - no abbreviations)

City/Town | Province | Postal Code | Alternate Telephone ( )

C. Accident/Illness Dates and Details

1. Date and hour of accident/Awareness of illness dd mm yy ☐ AM ☐ PM

Date and hour reported to employer dd mm yy ☐ AM ☐ PM

2. Who was the accident/illness reported to? (Name & Position)

Telephone ( ) Ext.

3. Was the accident/illness:
- ☐ Sudden Specific Event/Occurrence
- ☐ Gradually Occurring Over Time
- ☐ Occupational Disease
- ☐ Fatality

4. Type of accident/illness: **(Please check all that apply)**
- ☐ Struck/Caught
- ☐ Overexertion
- ☐ Repetition
- ☐ Fire/Explosion
- ☐ Fall
- ☐ Harmful Substances/Environmental
- ☐ Assault
- ☐ Other
- ☐ Slip/Trip
- ☐ Motor Vehicle Incident

5. Area of Injury (Body Part) - **(Please check all that apply)**
- ☐ Head
- ☐ Face
- ☐ Eye(s)
- ☐ Ear(s)
- ☐ Teeth
- ☐ Neck
- ☐ Chest
- ☐ Upper back
- ☐ Lower back
- ☐ Abdomen
- ☐ Pelvis
- ☐ Other

Left		Right
☐	Shoulder	☐
☐	Arm	☐
☐	Elbow	☐
☐	Forearm	☐

Left		Right
☐	Wrist	☐
☐	Hand	☐
☐	Finger(s)	☐

Left		Right
☐	Hip	☐
☐	Thigh	☐
☐	Knee	☐
☐	Lower Leg	☐

Left		Right
☐	Ankle	☐
☐	Foot	☐
☐	Toe(s)	☐

6. Describe what happened to cause the accident/illness and what the worker was doing at the time (lifting a 50 lb. box, slipped on wet floor, repetitive movements, etc. . .). Include what the injury is and any details of equipment, materials, environmental conditions (work area, temperature, noise, chemical, gas, fumes, other person) that may have contributed. **For a condition that occurred gradually over time, please attach a description of the physical activity required to do the work.**

WSIB ONTARIO CSPAAT

7 Employer's Report of Injury/Disease (Form 7)

Please PRINT in black ink

Claim Number

Worker Name | Social Insurance Number

C. Accident/Illness Dates and Details (Continued)

7. Did the accident/illness happen on the employer's premises (owned, leased or maintained)? ☐ yes ☐ no
Specify where (shop floor, warehouse, client/customer site, parking lot, etc..).

8. Did the accident/illness happen outside the Province of Ontario? ☐ yes ☐ no
If **yes,** where (city, province/state, country).

9. Are you aware of any witnesses or other employees involved in this accident/illness? ☐ yes ☐ no
If **yes,** provide name(s), position(s), and work phone number(s).
1. _____
2. _____

10. Was any individual, who does not work for your firm, partially or totally responsible for this accident/illness? ☐ yes ☐ no
If **yes,** please provide name and work phone number _____

11. Are you aware of any prior similar or related problem, injury or condition? ☐ yes ☐ no
If **yes,** please explain

12. If you have concerns about this claim, attach a written submission to this form. ☐ submission attached

D. Health Care

1. Did the worker receive health care for this injury? ☐ yes ☐ no
If **yes,** when : dd mm yy

2. When did the employer learn that the worker received health care? dd mm yy

3. Where was the worker treated for this injury? **(Please check all that apply)**
☐ On-site health care ☐ Ambulance ☐ Emergency department ☐ Admitted to hospital ☐ Health professional office ☐ Clinic
☐ Other: _____

Name, address and phone number of health professional or facility who treated this worker (if known) _____

E. Lost Time - No Lost Time

1. Please choose one of the following indicators. **After the day of accident/awareness of illness, this worker:**
☐ Returned to his/her **regular job** and **has not** lost any time and/or earnings. **(Complete sections G and J).**
☐ Returned to **modified work** and **has not** lost any time and/or earnings. **(Complete sections F, G, and J).**
☐ **Has** lost time and/or earnings. **(Complete ALL remaining sections).**

▶ Provide date worker first lost time dd mm yy
▶ Date worker returned to work (if known) dd mm yy ☐ regular work ☐ modified work

2. This Lost Time - No Lost Time - Modified Work information was confirmed by:
☐ Myself ☐ Other
Name _____ Telephone ( ) Ext.

F. Return To Work

1. Have you been provided with work limitations for this worker's injury? ☐ yes ☐ no

2. Has modified work been discussed with this worker? ☐ yes ☐ no

3. Has modified work been offered to this worker? ☐ yes ☐ no
If **yes,** was it ☐ Accepted ☐ Declined
☐ If Declined please attach a copy of the written offer given to the worker.

4. Who is responsible for arranging worker's return to work
☐ Myself ☐ Other
Name _____ Telephone ( ) Ext.

next page

WSIB ONTARIO CSPAAT

7 Employer's Report of Injury/Disease (Form 7)

Claim Number

Please PRINT in black ink

Worker Name | Social Insurance Number

G. Base Wage/Employment Information - (Do not include overtime here)

1. Is this worker **(Please check all that apply)**

- ☐ Permanent Full Time
- ☐ Permanent Part Time
- ☐ Temporary Full Time
- ☐ Temporary Part Time
- ☐ Casual/Irregular
- ☐ Seasonal
- ☐ Contract
- ☐ Student
- ☐ Unpaid/Trainee
- ☐ Other
- ☐ Registered Apprentice
- ☐ Optional Insurance
- ☐ Owner Operator or (Sub) Contractor

2. Regular rate of pay $ _____ per ☐ hour ☐ day ☐ week ☐ other _____

H. Additional Wage Information

1. Net Claim Code or Amount Federal _____ Provincial _____

2. Vacation pay - on each cheque? ☐ yes ☐ no Provide percentage _____ %

3. Date and hour last worked dd mm yy ☐ AM ☐ PM

4. Normal working hours on last day worked From ☐ AM ☐ PM To ☐ AM ☐ PM

5. Actual earnings for last day worked $ _____

6. Normal earnings for last day worked $ _____

7. Advances on wages: Is the worker being paid while he/she recovers? ☐ yes ☐ no If yes, indicate: ☐ Full/Regular ☐ Other _____

8. Other Earnings (Not Regular Wages): Provide the **total of additional earnings** for each week for the 4 weeks before the accident/illness.

* For Rotational Shift workers - If the shift cycle exceeds 4 weeks, please attach the earnings information for the last complete shift cycle prior to the date of accident/illness.

▼ Use these spaces for any other earnings (indicate Commission, Differentials, Premiums, Bonus, Tips, In Lieu %, etc..).

Period	From Date (dd/mm/yy)	To Date (dd/mm/yy)	Mandatory Overtime Pay	Voluntary Overtime Pay	Commission	Commission	Commission	Commission
Week 1			$	$	$	$	$	$
Week 2			$	$	$	$	$	$
Week 3			$	$	$	$	$	$
Week 4			$	$	$	$	$	$

I. Work Schedule (Complete either **A, B or C. Do not** include overtime shifts)

☐ **(A.) Regular Schedule** - Indicate normal work days and hours.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday

▶ **Example:** Monday to Friday, 40 hours

S	M	T	W	T	F	S
	8	8	8	8	8	

or,

☐ **(B.) Repeating Rotational Shift Worker** - Provide

NUMBER OF DAYS ON	NUMBER OF DAYS OFF	HOURS PER SHIFT(s)	NUMBER OF WEEKS IN CYCLE

▶ **Example:** 4 days on, 4 days off, 12 hours per shift, 8 weeks in cycle.

or,

☐ **(C.) Varied or Irregular Work Schedule** - Provide the total number of regular hours and shifts for each week for the 4 weeks prior to the accident/illness. (Do not include overtime hours or shifts here).

	Week 1	Week 2	Week 3	Week 4
From/To Dates (dd/mm/yy)	/	/	/	/
Total Hours Worked				
Total Shifts Worked				

J. It is an offence to deliberately make false statements to the Workplace Safety and Insurance Board. I declare that all of the information provided on pages 1, 2, and 3 is true.

Name of person completing this report (please print) | Official title

Signature | Telephone ( ) Ext. | Date dd mm yy

Please print form & sign before returning to the WSIB

THE WORKPLACE SAFETY AND INSURANCE ACT REQUIRES YOU GIVE A COPY OF THIS FORM TO YOUR WORKER

WSIB ONTARIO CSPAAT

7 Employer's Report of Injury/Disease (Form 7)

Please PRINT in black ink

Claim Number	
Worker Name	Social Insurance Number

K. Additional Information

THE WORKPLACE SAFETY AND INSURANCE ACT REQUIRES YOU GIVE A COPY OF THIS FORM TO YOUR WORKER

Health and Safety Executive (HSE), United Kingdom: Report of an injury or dangerous occurrence

HSE Health & Safety Executive

Health and Safety at Work etc Act 1974 ?

The Reporting of Injuries, Diseases end Dangerous Occurrences Regulations 1995

Click here for report guidanc

Report of an injury or dangerous occurrence

Filling in this form

This form must be filled in by an employer or other responsible person.

Part A

About you

1 What is your full name?

2 What is your job title?

3 What is your telephone number?

About your organisation

4 What is the name of your organisation?

5 What is its address and postcode?

6 What type of work does the organisation do?

Part B

About the incident

1 On what date did the incident happen?

2 At what time did the incident happen?
(Please use the 24-hour clock eg 0600)

3 Did the incident happen at the above address?

Yes ☐ Go to question 4

No ☐ Where did the incident happen?

- ☐ elsewhere in your organisation – give the name, address and postcode
- ☐ at someone else's premises – give the name, address and postcode
- ☐ in a public place – give details of where it happened

If you do not know the postcode, what is the name of the local authority?

4 In which department, or where on the premises, did the incident happen?

Part C

About the injured person

If you are reporting a dangerous occurrence, go to Part F. If more than one person was injured in the same incident, please attach the details asked for in Part C and Part D for each injured person.

1 What is their full name?

2 What is their home address and postcode?

3 What is their home phone number?

4 How old are they?

5 Are they

☐ male?

☐ female?

6 What is their job title?

7 Was the injured person (tick only one box)

☐ one of your employees?

☐ on a training scheme? Give details:

☐ on work experience?

☐ employed by someone else? Give details of the employer:

☐ self-employed and at work?

☐ a member of the public?

Part D

About the injury

1 What was the injury? (eg fracture, laceration)

2 What part of the body was injured?

Next Page

3 Was the injury (tick the one box that applies)

- ☐ a fatality?
- ☐ a major injury or condition? (see accompanying notes)
- ☐ an injury to an employee or self-employed person which prevented them doing their normal work for more than 3 days?
- ☐ an injury to a member of the public which meant they had to be taken from the scene of the accident to a hospital for treatment?

4 Did the injured person (tick all the boxes that apply)

- ☐ become unconscious?
- ☐ need resuscitation?
- ☐ remain in hospital for more than 24 hours?
- ☐ none of the above.

Part E

About the kind of accident

Please tick the one box that best describes what happened, then go to Part G.

- ☐ Contact with moving machinery or material being machined
- ☐ Hit by a moving, flying or falling object
- ☐ Hit by a moving vehicle
- ☐ Hit something fixed or stationary
- ☐ Injured while handling, lifting or carrying
- ☐ Slipped, tripped or fell on the same level
- ☐ Fell from a height

  How high was the fall?

  ☐ metres
- ☐ Trapped by something collapsing
- ☐ Drowned or asphyxiated
- ☐ Exposed to, or in contact with, a harmful substance
- ☐ Exposed to fire
- ☐ Exposed to an explosion
- ☐ Contact with electricity or an electrical discharge
- ☐ Injured by an animal
- ☐ Physically assaulted by a person
- ☐ Another kind of accident (describe it in Part G)

Part F

Dangerous occurrences

Enter the number of the dangerous occurrence you are reporting. (The numbers are given in the Regulations and in the notes which accompany this form)

Part G

Describing what happened

Give as much detail as you can. For instance

- the name of any substance involved
- the name and type of any machine involved
- the events that led to the incident
- the part played by any people.

If it was a personal injury, give details of what the person was doing. Describe any action that has since been taken to prevent a similar incident. Use a separate piece of paper if you need to.

Part H

Your signature

Signature

Date

If returning by post/fax, please ensure this form is signed, alternatively, if returning by E-Mail, please type your name in the signature box

Where to send the form

Incident Contact Centre, Caerphilly Business Centre, Caerphilly Business Park, Caerphilly, CF83 3GG.
or email to riddor@natbrit.com or fax to 0845 300 99 24

Continue

For official use

Client number | Location number | Event number | ☐ INV REP ☐ Y ☐ N

Please continue on this page if necessary

Fundamental Principles of Occupational Health and Safety

Second edition
Benjamin O. Alli

This practical guide to developing effective occupational health and safety (OHS) policies and programmes is based on the provisions defined in the "core" ILO standards and instruments concerning OHS. It focuses on the key topics essential to promoting and managing national and enterprise OHS systems.

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