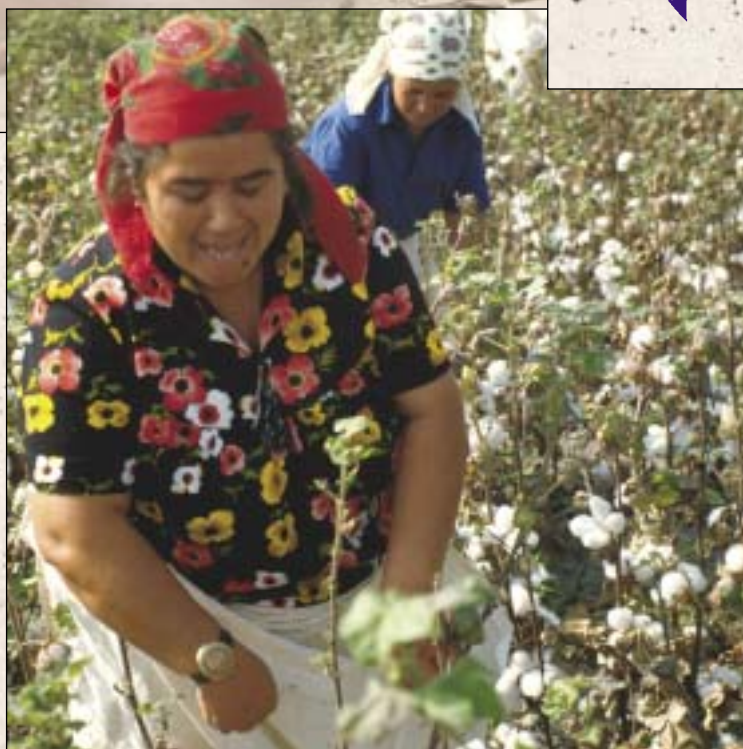




International  
Labour  
Organization



JANE PAUL

# Healthy beginnings: Guidance on safe maternity at work

**Healthy beginnings:  
Guidance on safe maternity at work**



JANE PAUL



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Guidance on safe maternity at work**

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# Table of contents

<b>Preface</b> .....	xi
<b>1. Maternity matters</b> .....	1
Why maternity matters .....	1
Making maternity a priority .....	1
Overview of the guide .....	2
Important note .....	2
<b>2. International standards on maternity protection</b> .....	5
About the International Labour Organization (ILO) .....	5
The Maternity Protection Convention, 2000 (No. 183) .....	6
The Maternity Protection Recommendation, 2000 (No. 191) .....	7
<b>3. How life begins</b> .....	9
Why maternity protection is needed .....	9
Conceiving a healthy child .....	10
<i>The role of hormones</i> .....	10
<i>Genetic mutations</i> .....	11
<i>Conception and implantation</i> .....	11
The stages of pregnancy .....	11
<i>Early pregnancy (the first three months)</i> .....	11
<i>Mid- to late pregnancy (months four to nine)</i> .....	12
Childbirth and delivery .....	14
Breastfeeding .....	14
<b>4. Reproductive hazards at work</b> .....	17
What are reproductive hazards? .....	17
What harm can they cause? .....	17
When can they cause harm? .....	19
Can they harm men too? .....	20
Biological agents .....	21
<i>Where are they found?</i> .....	21
<i>What harm can they cause?</i> .....	21
<i>How can people be infected?</i> .....	21
<i>Who is at risk?</i> .....	22
<i>When are they at risk?</i> .....	23
Chemical agents .....	24
<i>Where are they found?</i> .....	24
<i>How do they enter the body?</i> .....	24
<i>What harm can they cause?</i> .....	24
<i>Who is at risk and when?</i> .....	25



Physical agents .....	27
<i>Ionizing radiation</i> .....	27
<i>Non-ionizing radiation</i> .....	27
<i>Movements</i> .....	28
<i>Noise</i> .....	28
<i>Extremes of heat or cold</i> .....	29
<i>Hyperbarbic conditions</i> .....	29
<i>Who can be harmed by physical agents, and how?</i> .....	29
Physical and mental demands .....	31
<i>What are the sources?</i> .....	31
<i>Who can be harmed, and how?</i> .....	32
<i>Who is at risk, and when?</i> .....	32
Working conditions .....	33
<i>What can cause harm, and how?</i> .....	33
<i>Who is at risk, and when?</i> .....	34
Workplace safety and hygiene .....	35
<i>Sanitation, washing and changing facilities, and general hygiene</i> .....	35
<i>Drinking water, refreshment and eating areas</i> .....	35
<i>Emergency procedures and first aid</i> .....	36
<i>Security arrangements</i> .....	36
<i>Nursing facilities</i> .....	36
<b>5. Occupational risks in different sectors</b> .....	<b>39</b>
Hazards in agriculture, farming, floriculture and forestry .....	40
Hazards in call centres and contact centres .....	41
Hazards in the chemical and pharmaceutical industries .....	42
Hazards in cleaning, waste disposal and laundries .....	43
Hazards in clothing, footwear, textiles and toy industries .....	44
Hazards in construction and mining .....	45
Hazards in health care and other social and residential care .....	46
Hazards in hotels, catering and tourism .....	47
Hazards in manufacturing and assembly work .....	58
Hazards in retail and distribution trades, shops .....	49
<b>6. Taking action and preventing harm</b> .....	<b>51</b>
Principles for action by employers .....	51
<i>Benefits of general protection</i> .....	51
<i>Principles of prevention</i> .....	51
<i>Involving and consulting workers, especially women</i> .....	52
<i>Involving and consulting others</i> .....	52
Step One: Assessing the risks .....	55
<i>Identifying hazards</i> .....	55
<i>Identify people at risk: Who might be harmed, and how?</i> .....	58
<i>Take account of any individual circumstances</i> .....	59
<i>Evaluate the risks</i> .....	59

Step Two: Avoid the risks .....	60
<i>Making adjustments</i> .....	60
<i>Temporary job transfer</i> .....	61
<i>Success stories</i> .....	62
<b>7. Promoting healthy maternity</b> .....	<b>63</b>
Types of action .....	63
Action by employers .....	64
Action by trade unions .....	66
Action by health-care professionals .....	68
Action by governments .....	70
Action by women workers .....	71
What can non-governmental organizations (NGOs) do? .....	72
<b>References</b> .....	<b>73</b>
<b>Annexes</b>	
Annex 1: Checklists for identifying workplace risks .....	77
Annex 2: Examples of hazards and possible maternity protection measures .....	84
Annex 3: A confidential checklist for use by the individual worker .....	90
Annex 4: A sample risk assessment form .....	94
Annex 5: Examples of infection risks to expectant and nursing mothers in the workplace ...	96
Annex 6: Chemicals in the electronics industry that have toxic effects on reproduction .....	100
Annex 7: Examples of agents toxic to the male reproductive system .....	102
Annex 8: Pesticides linked to adverse reproductive effects .....	103
Annex 9: Useful resources and websites .....	105
<i>ILO resources</i> .....	105
<i>ILO/CIS resources</i> .....	106
<i>WHO, INCHEM and IPCS resources</i> .....	106
<i>Useful websites</i> .....	107



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# Preface

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In order for work to be decent, women workers need to be protected during maternity – protected from losing their jobs and protected from any risks to their health or that of their babies. This guide looks at maternity protection in the workplace, focusing on measures that can be taken to ensure a healthy beginning for both the mother and her child.

The starting point is the Maternity Protection Convention (No. 183), which was adopted by the International Labour Conference in 2000, in particular, the health protection measures that are foreseen in the Convention and its accompanying Recommendation (No. 191).

The material in this guide sets out basic principles and, in an effort to be relevant to a maximum number of settings, provides a wide range of information on reproductive hazards and how to prevent harm. Annexes provide a choice of practical tools which will be helpful in identifying workplace risks and finding solutions.

This is not a medical guide – it is designed for general use, mainly in workplaces in the formal economy. It is meant as a reference tool for employers, workers, trade union leaders, occupation health and safety advisors, labour inspectors, NGOs, women's organizations and anyone else with an interest in workplace health and maternity protection. We hope it will help them undertake practical action to improve maternity protection and health at work.

Improving maternal health and reducing child mortality are among the eight Millennium Development Goals of the United Nations. Reducing the work-related risks for pregnant and breastfeeding workers and their children can contribute to achieving these goals. This publication is thus a small contribution by the ILO to the worldwide effort to reach the millennium goals by 2015.

*François Eyraud*  
*Director*  
*Conditions of Work and Employment Programme*  
*Social Protection Sector*



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# 1. Maternity matters

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## Why maternity matters

Maternity protection safeguards the woman, her baby and her job. It also safeguards children's health and our future. Having children is natural. It should be a healthy, positive experience. But in many workplaces there are hazards that may affect reproductive health.

Not all workplaces are hazardous. But all workers (men and women) can be exposed to reproductive hazards at work unless steps are taken to protect them. These hazards can affect workers' fertility and their ability to conceive and bring healthy children into the world.

Making sure that the workplace is as free as possible of reproductive health hazards for both woman and men can benefit everyone.

- Women gain from a better quality of life, a better work environment, better job security, healthier pregnancies, safer childbirth, fewer complications, beneficial infant feeding, and improvements in their future health and life expectancy.
- Men gain from better reproductive health, healthier work environments, healthier children and fewer risks to their future health, their sexual functions and fertility.
- Children have a healthier, stronger and safer start in life, and better health in later life.
- Employers gain from a fitter and healthier workforce, now and in the future, and better productivity, improved staff morale, lower turnover of staff, and lower sickness, training and recruitment costs.
- Society at large gains from a healthier population, lower costs to the public purse from high maternal and infant mortality, a more productive workforce, and better quality of life through better health and longer life expectancy.

## Making maternity a priority

Maternity needs to be made a priority — in practice, as well as on paper. It is hoped that this document will facilitate such action.

Working women are central to progress, but they are not the only people who need to be involved nor do they necessarily have the power to make required changes. The message needs to reach other people who are affected or who make decisions affecting working lives, working conditions and health-care policy.

Policy-makers, health providers and authorities can be made more aware of the important effects that work hazards can have on health, both at work and in the community. Employers, trade unions, workers and communities can work together to find positive solutions and make lasting improvements in how we work and how we start our lives.

Raising awareness of health and safety issues can go hand-in-hand with changing attitudes to women's work and health and their role in society. Challenging discriminatory practices and promoting a more equal and positive workplace culture helps to support women at work and build better opportunities for everyone.

At work, in local communities, in the media and in public health information, in unions, professional bodies and research institutions, in non-governmental organizations (NGOs) and government agencies and through the education system, the message is clear: **maternity matters, and maternity protection matters at work.**

## Overview of the guide

This guide is based on the Maternity Protection Convention, 2000 (No. 183), and the Maternity Protection Recommendation (No. 191) that supports it. It sets out the practical steps involved in protecting the woman worker and her child where the worker is

- working during pregnancy,
- has recently given birth,
- returning to work after pregnancy, or
- breastfeeding, or seeking to breastfeed when she returns to work.

This guidance

- sets out ILO standards for workplace health protection during maternity for the worker and her child;
- shows how the changes involved during and after pregnancy can affect the woman at work;
- provides information about common reproductive hazards at work;
- explains the harm they can cause, and the risks involved;
- provides information on risks in certain key sectors;
- looks at what employers, trade unions and others can do to prevent these risks and avoid harmful effects;
- gives examples of good practice in the workplace.

The annexes provide some practical tools designed to help those wishing to improve workplace maternity protection and reproductive health. In particular, there are checklists to help with identifying hazards and workers at risk as well as lists to help identify the actions needed to avoid the risks. You can select and adapt these tools to suit your needs in your own workplace.

## Important note

These tools are for general guidance only, and do not cover every eventuality. They need to be adapted for use in different workplaces, as every workplace is different. The checklists are not a substitute for risk assessment, but they may help you and others to identify and resolve problems in the workplace. Trade union and worker involvement is an important part of the process and can benefit everyone.

In this guide, the terms “woman” and “child” are used in a general way to mean the woman and child at any relevant time during and after pregnancy and childbirth or when breastfeeding, except when it refers to a particular stage of development.

### POINTS TO REMEMBER: Using these tools

- ▶ Involve and consult others – including the woman – when using the tools and assessing risks. Take account of individual needs, medical advice and relevant advice from competent authorities.
- ▶ A checklist is a useful tool, but it is not a substitute for a full risk or health assessment.
- ▶ You still need to assess all the risks, inform the woman and take practical action to put maternity protection measures in place.

### **DID YOU KNOW?**

- The World Health Organization (WHO) estimates that every year around 8 million women have pregnancy-related complications and over half a million die as a result. Nearly 4 million babies die within the first week of life, and another 3 million are born dead, yet many of these deaths are preventable.
- Recent findings on maternal mortality by the WHO, the United Nations Children's Fund (UNICEF) and the United Nations Population Fund (UNFPA) show that a woman living in sub-Saharan Africa has a 1 in 16 chance of dying during pregnancy or childbirth. This compares with a 1 in 2,800 risk for a woman from a developed region.
- African women are 175 times more likely to die in childbirth than women in developed regions of the world.
- Of the estimated 529,000 maternal deaths in 2000, 95 per cent occurred in Africa and Asia, while only 4 per cent (22,000) occurred in Latin America and the Caribbean, and less than 1 per cent (2,500) in the more developed regions of the world.
- Worldwide, 13 developing countries accounted for 70 per cent of all maternal deaths.

Source: WHO, 2003a





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## 2. International standards on maternity protection

This section

- explains the role of the International Labour Organization (ILO) and ILO Conventions and Recommendations
- outlines key points concerning maternity rights and workplace health protection in the Maternity Protection Convention, 2000 (No. 183), and Recommendation, 2000 (No. 191), that accompanies it.

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In June 2000, the ILO formally adopted a new Maternity Protection Convention (No. 183), along with a detailed Recommendation on maternity protection (No. 191). These aim to:

- protect the health and safety of the mother and the child;
- further promote equality of all women in the workforce.

### About the International Labour Organization (ILO)

The ILO is a specialist agency of the United Nations. It brings together representatives of employers, workers and ILO member States (governments) from around the world to develop policies, minimum standards and good practice in the workplace.

ILO members discuss and agree Conventions and Recommendations. These instruments are formally adopted at the International Labour Conference, a tripartite meeting which convenes annually. Conventions set minimum international standards for the workplace. Recommendations provide guidance on policy, legislation and practice.

Conventions cover many aspects of the world of work, including maternity protection. They create binding obligations to implement their provisions through ratification by ILO member States.

In his address to the International Labour Conference in June 2000, Mr. Juan Somavia, Director-General of the ILO, made the following declaration on maternity protection:

I want to go to the core of this debate – the human being concerned, the woman who would like to be able to bear a child safely and to nurture her child for some time after its birth without fear of losing her job, her income or her career.

It is not an unreasonable demand. This is part of the whole contemporary debate on work and family life and the stability of the family.

The response cannot just be a business or a market decision. It is too important. It is a societal decision.

## The Maternity Protection Convention, 2000 (No. 183)

Maternity protection has long been a priority for the ILO, the first Maternity Protection Convention dating back to 1919. Convention No. 183 was adopted in 2000 and replaces previous ILO Conventions on maternity protection. As in all previous Conventions, maternity protection is seen as being the shared responsibility of government and society.

Convention No. 183 sets minimum standards for workplace maternity protection, including:

- 14 weeks' maternity leave ;
- cash benefits during leave of at least two-thirds of earnings;
- health-care benefits ;
- protection from dismissal during pregnancy, maternity leave and a period on return to work;
- rights to workplace health protection for the woman and the child, including breastfeeding.

On workplace health protection, which is the focus of this guide, the Convention states that the woman:

- should not be obliged to carry out work that is a significant risk to her health and safety or that of the child (Article 3);
- shall be provided with additional leave for pregnancy-related illness or complications of pregnancy (Article 5);
- shall be provided with paid breaks or reductions in working time to breastfeed her child (Article 10)

These standards apply to all employed women workers, including women in atypical forms of employment. They supplement other Conventions and Recommendations on occupational safety and health, social security and workers' rights.

### DID YOU KNOW?

- Women are nearly half of the world's workforce.
- Women supply the main financial support for 30 per cent of the world's homes.
- By 2010, 70 per cent of women will be employed during their childbearing years.

Source: ILO, 1999

## The Maternity Protection Recommendation, 2000 (No. 191)

The Maternity Protection Recommendation gives more detailed guidance on health protection and supplements Convention No. 183. It recommends that employers should:

- assess risks to the woman and her child at work, taking account of her health needs;
- inform her of any risks to her own or her child's health;
- avoid exposing her or the child to significant health risks, working through these steps:
  - eliminating risks
  - adapting her working conditions
  - transferring her to other work without loss of pay, *or (if this is not feasible)*
  - giving her paid leave until it is safe for her to return
- avoid compulsory night work if it is incompatible with her pregnancy or breastfeeding;
- allow her to take time off to seek medical care during pregnancy;
- allow one or more nursing breaks or a daily reduction of working hours to breastfeed her child, without loss of pay;
- establish facilities in hygienic conditions at or near the workplace so that the woman can continue breastfeeding when she returns to work after maternity leave, where practicable.

### POINTS TO REMEMBER: The new Convention

- ▶ The new Convention establishes rights for **all** employed women, including those in atypical forms of dependent work.
- ▶ Employers should assess and avoid risks to both mother and child.
- ▶ The woman should be informed of any significant risk to her or her child.
- ▶ The woman's employment should be protected during pregnancy, maternity leave and a period following her return to work.
- ▶ The woman shall have the right to one or more daily breaks or a reduction in daily hours to breastfeed.



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## 4. How life begins

This section

- provides some general information about reproductive health
  - outlines what happens during and after pregnancy
  - explains how these changes can affect women at work
  - explains how work can interfere with the normal process
- 

### Why maternity protection is needed

Pregnancy is not an illness. Many women work through most of their pregnancy and return to work after childbirth.

Generally speaking, working during pregnancy is not in itself a risk, except immediately before and after childbirth. But some aspects of pregnancy can affect a woman at work, there can be complications during or after the pregnancy, and there may be things at work that put the woman or the child at risk. Some workplace hazards can also harm men's reproductive health, affecting their fertility and their ability to father healthy children.

Many women are able to continue working without problems until late in their pregnancies. Even so, workplace health protection is essential:

- the work may be hazardous;
- the woman may be more susceptible to some workplace hazards at this time, and may be harmed in different ways;
- there are particular risks to health at each stage of the pregnancy and of the child's development;
- the health needs of expectant mothers change
  - as the pregnancy progresses
  - before and after delivery
  - when breastfeeding

Human reproduction depends on our *reproductive system*. This system includes the sexual organs, glands and the hormones they produce. Understanding how the system works is helpful for understanding how and when harm can be done. The remainder of this chapter provides some basic information on conception, pregnancy, childbirth and breastfeeding – what is happening and how harm can occur.

### Some general needs for a healthy pregnancy

- Healthy parents with healthy sperm and eggs
- A healthy diet with adequate nutrition and refreshment
- Fresh air, natural light and clean drinking water
- A safe and healthy environment
- Adequate shelter
- Ready access to facilities for hygiene and sanitation
- Opportunities for appropriate movement and exercise
- Plenty of sleep, with extra rest especially just before and just after the birth
- Physical, emotional and financial security (including freedom from fear or violence)
- Access to appropriate health care and maternity support

## Conceiving a healthy child

Healthy beginnings start before conception. A child is conceived when sperm from a man's testes fertilizes an egg from the woman's ovaries.

Infertility, sterility or sexual problems can affect both men and women, preventing conception. Many things can cause these problems, including being exposed to certain harmful agents at work. Good general health can improve men's and women's fertility.

To father healthy children, men need healthy sexual organs and hormone production, healthy sperm and regular sperm production, and adequate sex drive and sexual performance.

Sperm are routinely produced and stored in the man's testicles and deposited in the woman's vagina during sexual intercourse. They swim up through the woman's womb and fallopian tubes seeking an egg to fertilize. But this system can be damaged.

- If few or no sperm are produced, the man may be infertile or sterile.
- Slow-moving or irregular-shaped sperm may not make the journey to the fallopian tubes.
- Some infections and hazardous substances can be transferred to the woman or the child by sperm, exposing them to possible harm.
- Damaged sperm can cause miscarriage or heritable diseases [NIOSH, 1997].

## The role of hormones

For reproduction, special hormones are released into the bloodstream by the brain and the pituitary gland and by the gonads (*testes* in men and *ovaries* in women). Hormones are chemicals produced in the body. They play a vital part in reproduction and affect growth and development. They can trigger changes in the body, as they do during and after pregnancy.

Hormones control many things, including sexual behaviour, pregnancy and breastmilk production. Women's ovaries produce sex hormones that regulate the monthly menstrual cycle and contribute to general health. Men's testes produce the male sex hormone that controls sperm production (amongst other things). The woman has all her eggs by the time she is born, but men produce sperm throughout their lives.

Some things can affect the *endocrine system* that regulates hormone production. They are known as *endocrine disruptors*.

## Genetic mutations

Every human cell (including male sperm and female eggs) carries *genes* in chromosomes made up of chemicals called DNA. DNA contains the “blueprint” for cell development. What we inherit from our parents (for example, the colour of our eyes) depends on these genes.

Genes can be changed by exposure to certain harmful agents – changes in genetic material are called *mutations*. These changes can be passed on to future generations, even if the damage occurs before conception. They cannot be reversed.

Things that can cause this damage are called *mutagens*. Some mutagens can damage genetic material in sperm or eggs before conception. Some mutations can result in birth defects, miscarriage or stillbirth. Some damage may not be seen until it shows in the next generation.

## Conception and implantation

During her menstrual cycle, the woman’s ovaries release one of the many hundreds of eggs she is born with. The lining of her womb thickens in preparation for a possible pregnancy. The egg travels down the *fallopian tubes* that connect her ovaries and her womb.

If the egg is fertilized there by a man’s sperm, these two cells join together inside the woman’s body and trigger a chain of events that begin a new life. The woman stops having her monthly period (*menstruation*) and her body is alerted to her pregnancy by hormone changes. (If the woman does not conceive, the womb discards this lining about two weeks later and she menstruates.)

Once fertilized, the egg divides rapidly and implants itself in the lining of the woman’s womb. Here it becomes an *embryo* and starts developing into a *foetus* (an unborn child). In these very early formative stages of pregnancy, it divides into layers of the cells that will form particular parts of the child’s body.

*Implantation* triggers many changes in the woman, releasing pregnancy hormones.

## The stages of pregnancy

A normal pregnancy lasts nine months with several key stages of development. These stages affect women differently. Every pregnancy is unique, but they have many things in common.

The same woman can experience different effects in different pregnancies.

Pregnancy brings about profound changes in a woman’s body. Her body functions differently, and her body shape changes. There are further very rapid changes at the end of the pregnancy.

Knowing how these changes affect women can help us understand how reproductive health can be affected by hazards at work and how risks can be avoided.

## Early pregnancy (the first three months)

### *The foetus*

During this time in a healthy pregnancy, the life support system in the womb is formed.

- The *placenta* forms and attaches to the wall of the womb, connecting the embryo to the mother’s blood supply via an *umbilical cord* coming out of one side of the placenta. This brings essential nutrients and oxygen from the mother. The placenta acts as a filter to help protect the child from harmful agents in the mother’s bloodstream.
- The placenta produces special pregnancy hormones that tell the mother’s body to adapt to support the pregnancy.
- A “sack” of membranes containing *amniotic fluid* forms inside the womb to cushion the unborn child throughout the pregnancy (it needs to be free from infection to protect the child).



Some substances can affect the amount of oxygen carried in the bloodstream, affecting the health of the woman and the child. If oxygen is restricted, the embryo may not develop properly. If a harmful substance crosses the “placental barrier”, it may harm the child or threaten the pregnancy. If the placenta becomes detached, the child will die.

The embryo starts to develop.

- The heart and other major organs start to form. At around five weeks, the heart starts beating.
- The muscles, brain, central nervous system, head, skin and other parts of the body start to develop.
- By week 12 in a healthy pregnancy, the basic body structure is complete (after eight weeks the embryo is called a *foetus*).

### *The woman*

The woman’s rapid hormonal and physiological changes continue.

- She may experience discomfort (pregnancy hormones can slow down the digestive tract causing constipation, and can sometimes trigger nausea or “morning sickness” or backache, nasal congestion, tiredness and headaches).
- She may be more sensitive to smells and unable to tolerate certain foods or smells.
- She can feel more tired than usual and she may be more likely to experience mood swings, anxiety or stress.
- Her blood volume increases and her heart has to work harder to supply blood to the placenta.
- Her joints start to loosen so the pelvis can expand during birth, making them more injury-prone.
- She needs to drink water – and pass water – more often.

A healthy diet, plenty of sleep, gentle exercise, plenty of drinking water and early health checks are important in this critical stage.

Some pregnancies end in *spontaneous abortion* (miscarriage) before the embryo has developed or before the foetus is viable (strong enough to survive outside the womb). During miscarriage the embryo or foetus and other “products of pregnancy” are expelled from the womb. These problems can be caused by exposure to certain harmful agents, but many causes are unknown. As a general rule, the risk of miscarriage is greatest in the early months of pregnancy.

If the woman miscarries or haemorrhages, she may bleed heavily and experience sudden changes due to the ending of the pregnancy. Medical care and extra rest may be required to make sure she recovers without further complications. If the foetus dies in the womb but is not expelled, medical intervention may be needed.

## Mid- to late pregnancy (months four to nine)

### *The foetus*

During this time, in a healthy pregnancy the foetus continues to develop and grows rapidly.

- It develops reflexes and senses.
- It starts to move and hear sounds.
- It develops regular sleeping and waking patterns.
- It continues developing and growing in preparation for life outside the womb.

By seven months, the foetus is normally positioned head down in the womb in preparation for birth at nine months.

### *The woman*

The woman experiences other changes.

- Her early symptoms often disappear (some women get a surge of energy), but further changes affect her circulation and her breathing.
- By 32 weeks her blood volume will have increased by 40 to 50 per cent. There is extra pressure on her blood vessels, and her heart has to work nearly twice as hard as before to pump it through her body.
- Her heart is working harder and pregnancy hormones are affecting her breathing to help get oxygen to the baby, but her womb is higher so her lungs have less room to expand.
- Pregnancy can make it harder for her heart to adapt to physical exertion.
- Her hands, feet or ankles may swell slightly and she may have haemorrhoids (piles) or varicose veins.
- She may have problems standing for long periods and may feel dizzy.
- She may get breathless easily and changes in her breathing mean that she may inhale more pollutants than at other times.

Her joints continue to loosen and her ligaments soften and stretch.

- She may suffer aches or pain.
- She may be more prone to injuries caused by physical stress and strain.

Pregnancy changes her physical shape.

- Clothing, uniforms or work equipment may not fit.
- Some postures and movements can become difficult, uncomfortable or even dangerous.
- Her balance may be affected in late pregnancy.
- Mobility problems in late pregnancy can make it harder to do tasks requiring agility, climbing or extensive movement.

If the woman becomes dehydrated, it can interfere with the blood supply to the foetus.

Pregnancy can also affect how a woman's body responds to *hyperbaric conditions* or *pressurized atmospheres*, leading to risks to both the expectant mother and her unborn child.

Pre-natal medical visits are important. Complications at this stage can include, for a small minority, high blood pressure or life-threatening *pre-eclampsia*, diabetes (which can be triggered by pregnancy), miscarriage, premature delivery or the death of the unborn child.

#### **DID YOU KNOW?**

These changes are normal, but they make enormous demands on the woman – her daily energy requirements for simply maintaining the state of pregnancy (before doing anything else) are equivalent to two to three hours' arduous physical activity.

## Childbirth and delivery

In a normal pregnancy, the unborn child is ready for birth at 39 weeks. Around this time:

- the woman's womb starts having strong contractions to push the baby out;
- the baby is delivered (normally head-first) through the women's cervix and vagina or "birth canal", followed by the placenta.

Giving birth makes enormous demands on the woman. If there are complications, the child may have to be delivered by a doctor by Caesarean section (through a cut in the abdominal wall). There can be complications in some cases, such as abnormal delivery or multiple births, but regular medical checks and attention can often help detect and prevent problems. Risks of childbirth include excessive bleeding, haemorrhage or abnormal blood clots.

If the child dies in the late stages of pregnancy, the mother still has to give birth (delivery of the dead foetus is called a *stillbirth*). If the newborn child dies shortly after delivery, it is called *neonatal death*. If the baby is delivered early (before 37 weeks), it is called a *premature birth* or *pre-term delivery*. Medical care may be needed urgently to safeguard the mother and child.

Some children are born at full term but are very small (*low birth weight*). Some have developmental problems or birth defects. Low birth weight is linked to increased risks to health and development in later life.

After delivery the woman needs time and rest to heal and recover. At the same time, her child needs attention and feeding. Her sleep patterns are often interrupted and her body continues to supply her child as well her own needs. Recovery time helps prevent complications such as infections, abnormal clotting or haemorrhage after birth. Extra recovery time is needed if there are complications from the birth, and mobility may be affected temporarily if she has suffered excessive bleeding or has had surgery.

After birth there are further hormone changes. The woman starts to produce breastmilk to feed her child. Other changes take longer: the softened ligaments take months to return to normal and there is a continuing risk of injury from physical stress or strain. Some women suffer from fatigue, anaemia, diabetes or post-natal depression. Health protection is vital in the post-natal period.

## Breastfeeding

The mother needs extra fluids and a healthy diet when breastfeeding her child. She also needs to set aside regular times for breastfeeding. The health benefits of breastfeeding to mother and child are well established and are detailed at the end of Chapter 4.

Infants are particularly vulnerable to hazardous agents. A few infections or toxic substances can pass to the baby through the mother's milk, causing it harm (examples are HIV and lead). Infants instinctively suckle anything they come in contact with, searching for food. Harmful agents on skin and clothing can enter the body through the baby's mouth and via hand-to-mouth contact.

### POINTS TO REMEMBER: How we begin

- ▶ Pregnancy, childbirth and breastfeeding are not illnesses but affect people differently.
- ▶ They place extra demands on the woman.
- ▶ Harm can occur at any stage, including harm to men and women before conception, but work-place health protection can help avoid the risks.
- ▶ Medical attention and preventive health care play a vital part in maternity protection, especially if there are risks of complications.
- ▶ Healthy breastfeeding protects both mother and child.

### Some useful definitions

**Reproductive hazard.** Something that may cause harm or damage to human reproduction at any stage, including harm to men's, women's and children's reproductive health at any stage.

**Risk.** The likelihood of harm.

**Exposure.** Being unprotected from a source of possible harm.

**Susceptibility.** The ease with which someone can be affected by exposure to a hazard.

**Birth defects.** A mental or physical problem that results in a developmental error of tissues that may or may not be inherited.<sup>a</sup>

**Carcinogen.** Something that can or may cause cancer.

**Foetal death.** Death of the foetus in the womb.

**Haemorrhage.** Discharge of blood from the blood vessels (sudden abnormal blood loss).

**Low birth weight.** Abnormally low weight at birth (less than 2,500 grams).<sup>b</sup>

**Mutagen.** Something that can or may cause genetic changes.

**Neonatal death.** Death of an infant within 28 days of a live birth.

**Premature birth.** Delivery before 37 weeks.

**Spontaneous abortion.** Foetal loss (miscarriage) up to 500 grams or 20 to 22 weeks or 25 cm in length.<sup>c</sup>

**Stillbirth.** Delivery of a foetus that is non-viable.

**Teratogen.** A toxic (poisonous) substance that can cross the placenta in the bloodstream from mother to child and prevents the normal development of the unborn child causing miscarriage, birth defects or illness.

**Toxic to reproduction.** A toxic substance that can or may cause harm to reproduction at any stage.

<sup>a</sup> As defined by the American College of Obstetricians and Gynaecologists.

<sup>b</sup> As defined by WHO, 1969.

<sup>c</sup> As defined by WHO, 1977.



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## 4. Reproductive hazards at work

This section

- gives a general introduction to reproductive hazards at work
  - looks at common reproductive hazards in the workplace, particularly those affecting the woman and the child
  - gives examples of possible risks to the woman and her child at work
- 

### What are reproductive hazards?

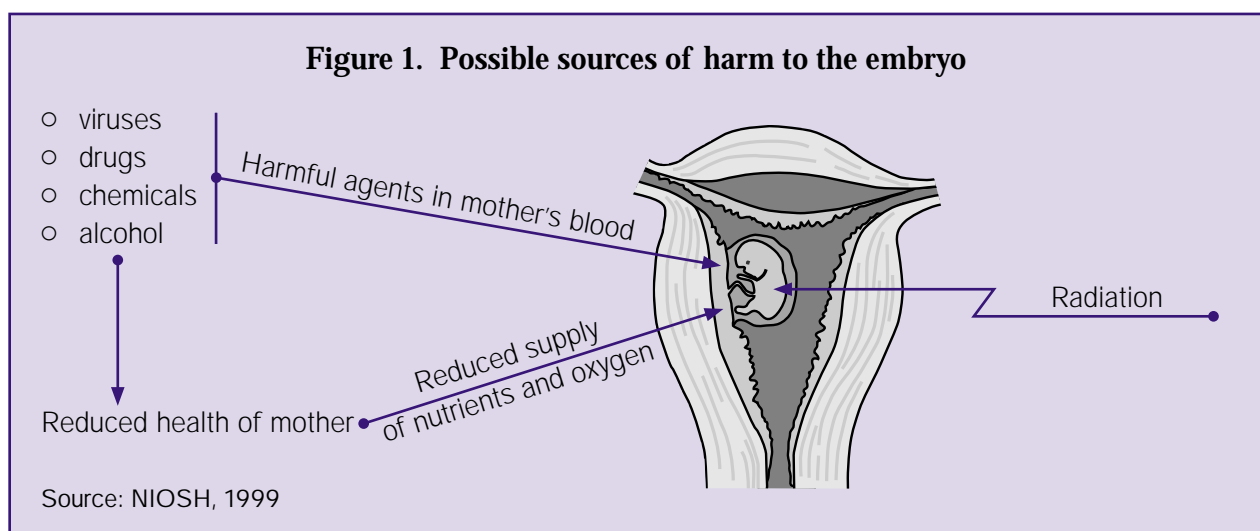
Reproductive hazards are things that can harm reproduction. Men, women and children can all be harmed, but not necessarily in the same way, at the same time or by the same hazards.

There are many kinds of reproductive hazards at work. They can be divided into different groups:

- biological agents
- chemical agents and other hazardous substances
- physical agents
- physical and mental demands
- working conditions
- other workplace health and safety and hygiene issues

### What harm can they cause?

During pregnancy, childbirth and breastfeeding two lives are involved, not just one: the woman's and the child's. They are not identical, and can each be harmed in different ways.

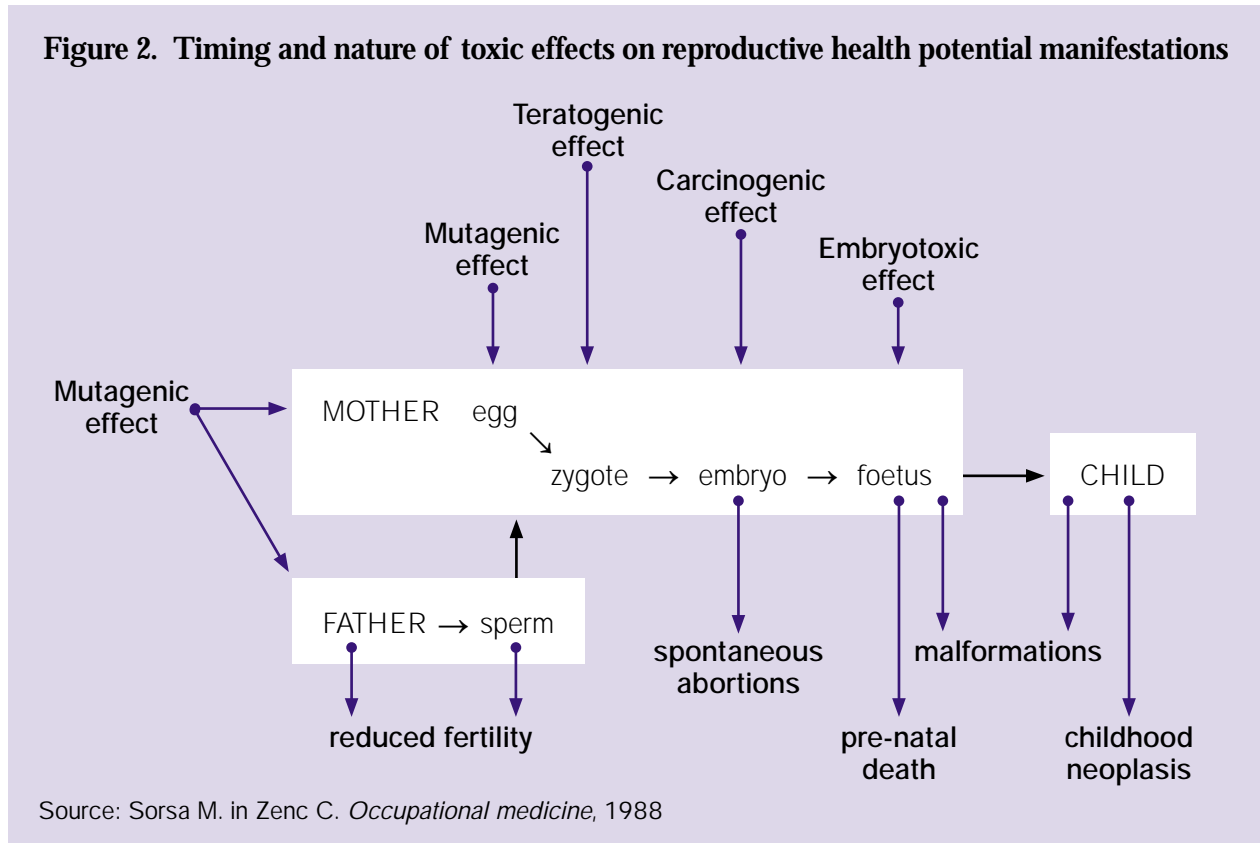


**Table 1. Examples of reproductive hazards affecting pregnancy and breastfeeding**

Type of hazard	Examples
Biological agents	<p>Bacteria, viruses, parasites and fungi, including:</p> <ul style="list-style-type: none"> <li>• infections carried and transmitted by people</li> <li>• some diseases carried by animals or other wildlife</li> <li>• some micro-organisms that are found in water, food, soil or other substances</li> </ul>
Chemical agents	<p>Chemicals, chemical compounds or chemical intermediates in any form, including:</p> <ul style="list-style-type: none"> <li>• chemicals that are or may be carcinogenic, teratogenic or mutagenic or toxic to reproduction at any stage</li> <li>• some heavy metals (e.g. mercury, lead)</li> <li>• some drugs</li> <li>• harmful chemicals that may be absorbed through the skin, swallowed or breathed in (e.g. pesticides or tobacco smoke)</li> </ul>
Physical agents	<ul style="list-style-type: none"> <li>• Ionizing and non-ionizing radiation</li> <li>• Impacts or excessive movements (e.g. shocks, jolts, vibration)</li> <li>• Noise</li> <li>• Extremes of heat or cold (including climate)</li> <li>• Pressurized atmospheres</li> </ul>
Physical and mental demands, movements and postures	<ul style="list-style-type: none"> <li>• Arduous work</li> <li>• Manual handling of loads</li> <li>• Prolonged sitting or standing</li> <li>• Awkward movements or postures</li> <li>• Transportation or travel</li> <li>• Stressful work or work situations</li> <li>• Intensive workloads</li> <li>• Work requiring balance</li> </ul>
Working time/ conditions	<ul style="list-style-type: none"> <li>• Night work, rotating shifts</li> <li>• Long or inflexible working hours (including overtime)</li> <li>• Restrictions on breaks</li> <li>• Starting and finishing times (too early or too late)</li> <li>• Lone working</li> <li>• Workplace harassment</li> <li>• Restrictions on maternity leave or leave for medical care</li> <li>• Lack of nursing breaks when breastfeeding</li> </ul>
Workplace/ hygiene problems	<ul style="list-style-type: none"> <li>• Inadequate first aid, fire and emergency procedures</li> <li>• Unsanitary or unhygienic conditions</li> <li>• Lack of access to clean toilets, washing and changing facilities</li> <li>• unhygienic eating and refreshment areas, lack of safe drinking water</li> <li>• Lack of nursing or rest facilities</li> <li>• Unsafe water (for washing, cleaning, cooking or drinking)</li> <li>• Rough terrain, uneven or slippery floor surfaces</li> <li>• Lack of space or poor workplace layout</li> <li>• Remote or inaccessible workplaces/environment</li> </ul>

## When can they cause harm?

They can cause harm at different stages, depending on the particular hazard. Their effects can depend on when and how people are exposed to the hazard, and on the nature of the hazard and the timing of exposure, as shown below.



Whether the adult or the child is harmed depends on:

- what the hazards are;
- what harm they can cause, and how;
- how much of the hazard they are exposed to;
- when and how they are exposed;
- how long and how often they are exposed;
- any synergistic effects (increased effects from exposure to more than one hazard at a time);
- individual factors (different people can be affected in different ways).



## Can they harm men too?

Some reproductive hazards affect men's fertility, sex drive or sexual performance as well as their ability to father healthy children. Some can cause cancer of male reproductive organs. Harmful exposure can damage a man's reproductive system or harm its development, affecting:

- male hormone production;
- sex drive or sexual functions;
- sperm production;
- sperm shape and behaviour;
- genetic material in sperm.

Harmful exposures that damage the man's reproductive health can affect the woman, the child and the pregnancy, even if they have not been directly exposed to harmful agents themselves.

- Some harmful agents (infections or chemicals) can be carried in sperm or in seminal fluid: they can enter the woman's body and expose her or the child to harm.
- Some can cause miscarriage, birth defects or stillbirth in his partner's pregnancy.
- Some harmful agents can be carried from the man's workplace to the home on contaminated clothing, skin or other things, exposing others (including the child) to harm.

**Table 2. Examples of hazards affecting men's reproductive health**

Type of hazard	Examples
Biological agents	<ul style="list-style-type: none"> <li>• Some infectious diseases, including diseases of childhood (e.g. mumps)</li> </ul>
Chemical agents	<ul style="list-style-type: none"> <li>• Chemicals that are or may be carcinogenic or mutagenic</li> <li>• Chemicals that may disrupt hormones or affect sperm production or sexual behaviour</li> <li>• Some heavy metals (e.g. lead)</li> <li>• Antimitoxic (cytotoxic) drugs</li> <li>• Some harmful chemicals that may be absorbed through the skin, breathed in or swallowed (e.g. pesticides, solvents)</li> </ul>
Physical agents	<ul style="list-style-type: none"> <li>• Radiation</li> <li>• Extremes of heat</li> </ul>
Physical and mental demands, working conditions	<ul style="list-style-type: none"> <li>• Things that cause fatigue or exhaustion</li> <li>• Prolonged stress</li> </ul>
Workplace/hygiene problems	<ul style="list-style-type: none"> <li>• Unsanitary conditions</li> <li>• Unsafe water (for washing, cleaning, cooking or drinking)</li> <li>• Inadequate washing, cleaning, decontamination</li> </ul>

Annex 7 provides more details on hazards for men and occupations where they may occur.

## Biological agents

Biological agents are micro-organisms that can cause disease in humans. They include bacteria and viruses, moulds and fungi and parasites.

Annex 5 provides details on infections which are hazardous for expectant and nursing mothers and their children.

### Where are they found?

Micro-organisms may be transmitted by infected people, animals, birds, insects and other wildlife (alive or dead) and in their urine, faeces or droppings. They can be carried in different ways:

- in air, droplets, sprays, water and other liquids
- in soil or dust
- in food or foodstuffs
- in body fluids or blood
- on skin
- in or on contaminated substances, materials, equipment and clothing

### What harm can they cause?

Some infections can cause serious reproductive harm, including sterility or infertility. The effects depend on the nature of the disease. Some can have more severe effects during pregnancy than at other times.

- Any severe infection is likely to harm the woman and therefore put the baby at risk.
- Some micro-organisms can infect the womb or cause miscarriages, foetal death, birth defects, still-birth, premature birth or early neonatal death.
- Some can lead to increased risks of cancer, illness or other health problems for the woman or the child in later life.
- A few can cause abnormal bleeding, blood clotting problems or complications from the birth.
- The woman may pass on an infection without experiencing any symptoms herself.

### How can people be infected?

Biological agents can infect people in different ways, depending on the particular infection and how it is carried. In some cases, the organism can be carried without any symptoms, or without affecting the carrier, but may still be passed on to the child or to someone else.

For infection, the micro-organism has to enter the body.

- Some micro-organisms can be breathed in or swallowed.
- Some are transferred from hand to mouth or other parts of the body.
- Some enter the body through cuts or skin abrasions (or by injection).
- Some can pass through the placenta in the mother's bloodstream and affect the child.
- Some can be carried in sperm into the woman's body to infect the woman or child.
- Others can infect the womb and therefore the child.
- Some can infect the child through direct contact with "unfiltered" blood at birth.
- A few (like HIV) can pass to the child in the mother's breastmilk.

## Who is at risk?

The child may be particularly at risk from infection, both before and after birth. Breastfed children are generally more able to resist infection than bottle-fed babies. The mother's antibodies pass to the child through her breastmilk, providing protection for the first six to eight months of life. Unlike the child, a woman is generally no more at risk from infection during pregnancy than at other times. Some infections, such as mumps, cause particular harm in men.

People's ability to resist infection depends on their immune response and the health of their immune system. This is a complex system that stimulates antibodies to fight off "foreign" agents that invade the body.

People acquire immunity at different stages of their lives: either *actively*, after fighting off a particular infection, or *passively* (for a short period), through antibodies in the mother's bloodstream or her breastmilk. The body "builds up" immunity with each new infection. Immunity to one infection does not make the body immune to another different one, nor is it necessarily permanent. Some immunity lasts longer than others, depending on the organism and the body's response.

Immunity to a particular infection can also be acquired through *vaccination*. This involves injecting (or feeding) a tiny amount of the infectious agent into the body to stimulate immunity and protect people from particular infection risks. *Medical advice is essential: some vaccinations can be harmful during or just before pregnancy.*

Some people have less resistance to infection than others because:

- they are in poor general health or have inherited immune deficiency;
- their immune response has been weakened or suppressed due to fatigue or stress or prior infections (such as hepatitis or HIV).

Some people are particularly at risk because their work exposes them to infections. Others are at risk because they live or work in areas where there are particular infection risks, and they have not been immunized, or have lost their immunity to the disease.

### Examples of biological agents and occupations at risk

- Common childhood diseases, such as rubella and chicken pox  
(*at risk: teachers, health workers and child-care staff*).
- Blood-borne viruses, such as hepatitis and HIV (which may also be sexually transmitted)  
(*at risk: health and residential care workers, prison staff, commercial sex workers*).
- Organisms carried by animals or birds (zoonoses) or in food, such as toxoplasma, listeria, chlamydia psittaci (*at risk: agricultural workers, farmers and other outdoor workers, laboratory staff and others working with animals and birds*).
- Insect-borne diseases, such as malaria  
(*at risk: outdoor workers and unprotected people in affected areas*).
- Diseases that thrive in unhygienic or crowded conditions, such as cholera and tuberculosis  
(*at risk: health-care workers and unprotected people working in affected areas*).

### When are they at risk?

Some infections may affect male and female reproductive health before conception. During and after pregnancy, some can affect the child and not the woman, and vice-versa. Some infections are most contagious during the incubation period, after the carrier has been infected but before symptoms appear.

The risks depend on:

- *how* and *when* people are exposed;
- whether they have *immunity* to the particular infection;
- whether their *immune systems* are strong enough to resist infection.

People who have been vaccinated against a particular disease or have acquired immunity through past exposure may be immune (and therefore protected against it), but how long they stay immune depends on the particular infectious agent. It is therefore important to check before relying on immunity to protect workers.

#### POINTS TO REMEMBER: **Biological agents**

- ▶ Some infections can harm the unborn child or put the woman or the pregnancy at risk.
- ▶ Some can pass to the baby during breastfeeding.
- ▶ Any severe infection during pregnancy will harm the woman and therefore the child.
- ▶ Effects may not show until later in pregnancy or after delivery.
- ▶ Some vaccinations can be harmful during or just before pregnancy or when breastfeeding. Always seek medical advice.

For more detailed information about infections and known and suspected reproductive health risks, please see Annex 5.

## Chemical agents

Chemical agents are chemical substances, chemical compounds or chemical intermediates that can occur naturally, accidentally, or as a result of manufacturing, processing, heating or use of equipment.

### Where are they found?

Chemical agents take many forms. They include *gases, vapours, mists, fumes or smoke, liquids, powders, dusts, granules and solids*. Some, like oxygen, are essential for life. They are not always obvious or visible. They can be found (in vast numbers):

- in *raw materials* in their natural form;
- in *manufactured products* used in particular work processes;
- in *by-products* of other processes or natural decay;
- in the *general working environment*,
- on or in *contaminated objects, clothing and other substances*.

### How do they enter the body?

Chemicals enter the body in different ways. Routes of entry can be different for the child.

#### How hazardous substances enter the body

##### *Routes of entry for the worker*

- By **inhalation** (breathing in)
- By **ingestion** (swallowing)
- By **absorption** (through the skin)
- By **injection** (skin puncture or cuts)

##### *Routes of entry for the child*

- **Before birth:** across the placenta (in mother's blood)
- **During delivery:** via the womb or contact with the mother's blood
- **When breastfeeding:** as above, or via contaminated breastmilk

### What harm can they cause?

Many chemicals are very hazardous to health, but many of the causes and effects are still unknown. Some are *known or suspected* to cause reproductive harm in animals or people. In the United States, over 2,500 were listed in 1995 as having effects on the foetus, but this is only a tiny proportion of the millions of chemicals used or produced around the world. Over a thousand new substances are added to the list each year, and the vast majority of chemicals used at work have not been examined for reproductive harm.

The effects of many workplace exposures are unclear. Workplaces and work processes vary greatly, just as chemicals do. The way something is used, produced or mixed, and the surrounding environment, can affect the chemical properties as well as the risks.

Chemical agents that are harmful to reproduction can damage reproductive health and development in men, women and children. Harmful exposures are not confined to exposures during pregnancy or breastfeeding.

- Some cause reproductive effects (e.g. on sperm production and fertility).
- Some can harm the foetus or its development.
- Some can cause heritable genetic damage or cancer of the reproductive organs.

The effects of chemicals depend on their *chemical properties* and the *nature and timing of exposures*.

- When and at what stage in the pregnancy exposure takes place.
- How much of the substance they are exposed to.
- How often and how long are they exposed.
- Whether there are any synergistic effects from the combination of two or more hazardous exposures which could increase the risks.

The risks also depend on how long a substance remains in the body after exposure (*residual effects*) and on how the substance is being used or produced and the environmental conditions at the time.

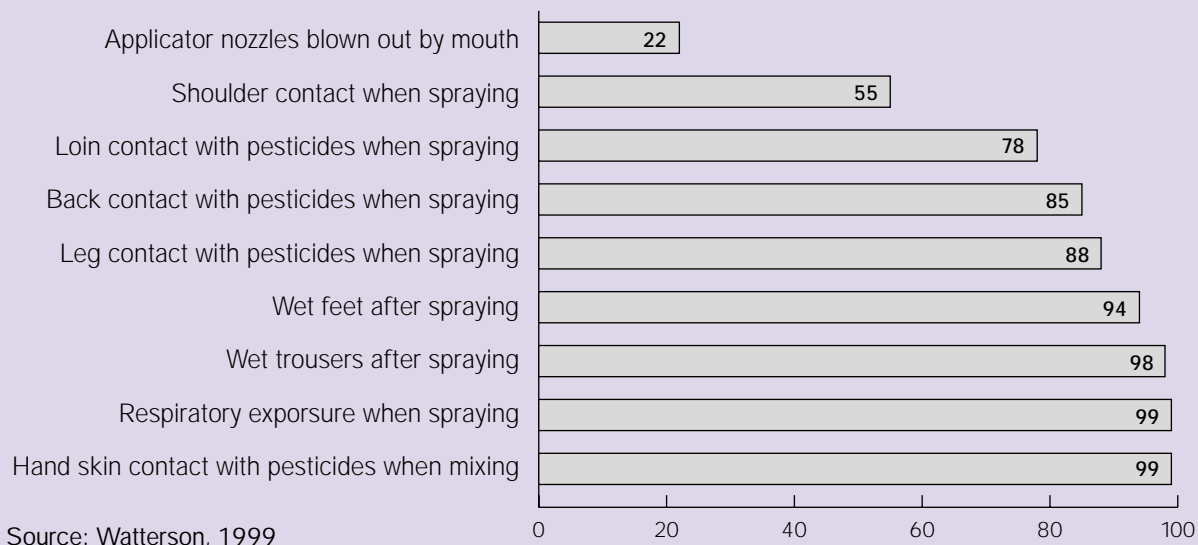
- Some substances can accumulate in the woman's body and cause harm to the child at a later date. An example is lead. This means that the lead in her body can harm her unborn or breastfeeding child, even if she has stopped being exposed to lead before getting pregnant or breastfeeding. However, the fact that a substance is known to potentially be harmful does not automatically make it so in practice if the exposure level is too low to cause harm. But the fact that something does not cause reproductive harm does not mean it is safe (it may cause other kinds of damage).

### Who is at risk and when?

Men, women and children are all at risk. Those at particular risk are those who are regularly exposed to hazardous chemicals in the course of their work without adequate protection, such as agricultural and forestry workers, workers in the textile and apparel trades or in toy manufacturing, and many construction workers.

**Table 3. Potential effects of chemical agents on reproduction**

Timing of effects	Potential effects
Before conception	<ul style="list-style-type: none"> <li>• Menstrual disorders (women)</li> <li>• Low sperm count, infertility or sterility (men)</li> <li>• Reduced sexual drive or impotence (men and women)</li> <li>• Damage to male or female reproductive organs, e.g. cancer</li> <li>• Heritable, irreversible genetic damage in sperm (men) and eggs (women) causing disease or birth defects, miscarriage or stillbirth</li> </ul>
Upon conception	<ul style="list-style-type: none"> <li>• Difficulties conceiving a child</li> </ul>
During pregnancy	Miscarriage, stillbirth, cancer, disease, birth defects and/or developmental problems due to substances that can: <ul style="list-style-type: none"> <li>• restrict oxygen and other essential supplies in the mother's blood</li> <li>• cross the placenta and reach the developing foetus</li> <li>• affect the mother's hormones or her general health</li> </ul>
On the child at or after birth or during breastfeeding	<ul style="list-style-type: none"> <li>• Premature birth, early neonatal death, low birth weight or developmental problems due to toxic effects of substances affecting development in the womb</li> <li>• Early childhood cancer (neoplasma) due to effects of earlier exposure to carcinogens</li> <li>• Toxic effects, including developmental problems and allergies due to substances carried in the mother's breastmilk or on parents' work clothes or skin</li> </ul>

**Figure 3. Exposure to pesticides of 161 women sprayers from Western Sumatra**

### Examples of chemical agents and workers at risk

- Some solvents and dry-cleaning fluids (*at risk: many, including cleaners, catering workers, engineers, mechanics, printers, painters, textile and manufacturing workers*).
- Some pesticides and insecticides (*at risk: agricultural, farming, floriculture and forestry workers, pesticide and insecticide production workers*).
- Lead (*at risk: painters, chemical workers, metalworkers, workers in toy factories*).
- Some medical drugs and cancer treatments (*at risk: health and pharmaceutical workers*).
- Some anaesthetics (*at risk: hospital workers in acute care, dentists, gas manufacturers*).
- Rubber chemicals (*at risk: people working in the rubber industry*).

The timing of exposure affects both who is at risk and whether the exposure is harmful.

- Exposures to hazardous chemicals in the first two months of pregnancy are particularly risky: this is the embryo's critical formative stage. The woman may not even know she is pregnant at this time.
- An unborn or breastfeeding child may be harmed at far lower levels of exposure than an adult. In some cases, there may be no safe level of exposure for the child or the woman.

### POINTS TO REMEMBER: Chemical agents

- ▶ Chemical agents can cause serious reproductive harm in men, women and children.
- ▶ Risks depend on the chemicals themselves and on the exposures involved.
- ▶ Many have not yet been tested for reproductive harm.
- ▶ The effects of many workplace exposures are unknown.
- ▶ The embryo is particularly vulnerable to harm in the early formative weeks of pregnancy.

## Physical agents

Physical agents include the following:

- *ionizing and non-ionizing radiation*
- *impacts or movements* (e.g. shocks, jolts, vibration)
- *noise*
- *extremes of heat or cold* (including climate)
- *hyperbaric conditions* (pressurized atmospheres)

Physical agents and their sources can be found in the workplace or working environment, or produced by work activities and work equipment. They can be transmitted in different ways to the worker and the child.

### Ionizing radiation

Ionizing radiation is a form of energy transmitted in rays. It can destroy human cells. There are important differences depending on the source and type of radiation.

- Some radiation sources can be switched off (such as X-ray machines).
- Some sources (such as nuclear waste) have a “half-life” and remain radioactive for generations to come.

Sources of ionizing radiation include some medical diagnostics and treatments (X-rays, radiotherapy); some industrial and medical scanners (used in diagnostics); irradiated substances including soil, land, dust, nuclear weapons, power stations and submarines.

The child can be exposed to radiation through the mother’s abdominal wall or through contact with irradiated particles on the mother’s skin or clothing.

### Non-ionizing radiation

Non-ionizing radiation is another form of energy, transmitted in waves at different frequencies. It can be detected as visible or ultraviolet light, infrared radiation, microwaves, lasers, radar, ultrasound (high-frequency sound waves) or electromagnetic fields (EMF).

Sources of non-ionizing radiation include the following:

- radio transmitters and some satellite dishes, telecommunications masts and some mobile telecommunications equipment;
- high voltage electrical power lines and other powerful electrical installations;
- display screen equipment, microwaves;
- some work equipment emitting strong electromagnetic fields.

Not all non-ionizing radiation is hazardous, but certain frequencies are hazardous at close proximity. For example, some microwaves can damage human tissue by causing heating of water molecules, but the tissue needs to be very close to the source to be damaged. These effects are the subject of continuing investigation and the evidence is contentious.



## Movements

Excessive movements – by the worker or by things that transmit movements to the worker's body – can affect pregnancy and may also affect men's reproductive health. They include shocks, jolts or vibration affecting the whole body or lower part of the body.

Sources of hazardous movements include the following:

- direct impacts on the worker or forceful movements by the worker;
- impacts or movement transmitted indirectly to the worker's body (through other things that move, jolt, vibrate or collide).

Examples of work activities involving excessive movements include the following:

- forceful pounding, chopping or beating;
- direct contact with equipment that transmits or causes vibration or other movement;
- jolts from crowds or animals or machinery;
- off-road transport, particularly on rough ground.

## Noise

Noise is created by sound waves. They are transmitted through gases, liquids or solids. Noise is detected in the ear as a result of pressure changes created by sound waves. Excessive noise exposure and certain frequencies can harm the woman and child. Noise is also a physical stressor.

Sources of noise at work include the following:

- impacts
- engines
- machinery or transport
- noisy work environments
- loudspeakers
- people
- electronic sources

### Examples of physical hazards and workers at risk

- Prolonged working outdoors in hot or cold weather conditions (*at risk: agricultural, farm and forestry workers, construction and refuse collection workers, market traders, railway and postal workers, seafarers*).
- Working in refrigerated areas, cold water or ice (*at risk: food manufacturing, abattoir workers, fisheries*).
- "Hot work" involving prolonged exposure to heat sources (*at risk: catering and laundry workers, iron and steel trades, workers in some manufacturing processes, and paper and board industries*).

## Extremes of heat or cold

Extremes of heat or cold can occur naturally or artificially in the work environment.

Sources of extreme temperatures include:

- *Heat*: sun, ovens, furnaces, engines, steam, laundries, paper mills, boilers, furnaces, flames, heated substances, incubators, heaters, boilers, engines and equipment or appliances involving heat exchange, some microwaves, people and animals.
- *Cold*: refrigerated areas, ice (or dry ice), cold water, cold climates (and rain, wind and snow), cold surfaces, and frozen or very cold substances.

Many factors can contribute to excessive heat or cold. They include:

- pregnancy (foetal temperature is higher than the mother's)
- overcrowding (people and animals produce heat)
- poor heating or ventilation or poor insulation
- prolonged physical exertion (this raises body temperature)
- synthetic clothing or poorly ventilated protective equipment
- lack of protection or shelter from the elements
- lack of control over working temperatures
- variations in time of day, location, seasons or climate

## Hyperbarbic conditions

Hyperbarbic conditions are pressurized atmospheres. Examples include:

- abnormal depths (mining or diving)
- extreme heights
- artificially pressurized atmospheres

## Who can be harmed by physical agents, and how?

Physical agents can cause different kinds of reproductive harm to the woman and her child. Some effects, such as the effects of diving when pregnant, can be serious and life threatening. Depending on the agent and the nature and timing of exposures, they may:

- harm the expectant mother;
- threaten her health and her pregnancy;
- cause foetal lesions or other damage;
- lead to low birth weight, miscarriage or premature birth.

**Table 4. Specific effects of physical agents**

Type of agent	Potential effects
Ionizing radiation	<ul style="list-style-type: none"> <li>• Can cause irreversible genetic damage</li> <li>• May cause cancers if parents or child are exposed to hazard</li> </ul>
Non-ionizing radiation (at certain frequencies)	<ul style="list-style-type: none"> <li>• Can cause heating of body tissue in humans</li> <li>• Has been linked to possible increased risks of childhood cancer (evidence is controversial)</li> <li>• Is not now thought to be linked to increased risks for VDU workers [WHO]</li> </ul>
Movements	<ul style="list-style-type: none"> <li>• Possible risk of placental detachment</li> <li>• Low birth weight</li> </ul>
Noise (at certain levels)	<ul style="list-style-type: none"> <li>• Increased risks of low birth weight</li> <li>• Can cause foetal lesions</li> <li>• Linked to possible increased risks of raised blood pressure, stress, miscarriage or premature birth</li> <li>• Linked to possible damage to foetal hearing when the unborn child is exposed to excessive noise through the mother's abdominal wall. (Ear protectors cannot protect the child.)</li> </ul>
Extremes of temperature	<ul style="list-style-type: none"> <li>• Linked to increased risks of miscarriage</li> <li>• Risks of dehydration and fatigue in the woman</li> <li>• Can affect the supply of breastmilk</li> </ul> <p><i>Note: Prolonged exposure to extreme heat or cold can be life-threatening</i></p>
Hyperbarbic conditions	<ul style="list-style-type: none"> <li>• Can threaten the pregnant woman and the child</li> <li>• Can affect oxygen and carbon dioxide in the bloodstream (special risks to the child)</li> </ul> <p><i>Note: No evidence of harm to breastfeeding women [European Commission, 1997]</i></p>

### POINTS TO REMEMBER: Physical agents

- ▶ Some physical agents can cause serious damage to both general and reproductive health in men and women.
- ▶ Some cannot be detected by the senses.
- ▶ They can have different effects on pregnant workers and on the child. The child is particularly vulnerable to harm.

## Physical and mental demands

Work activities make many different physical and mental demands on workers. Some types of demand, and some excessive demands, can be harmful to reproductive health. Tasks, people, activities, workplace, environment, equipment and loads all place demands on workers' bodies and minds, requiring mental, physical or emotional effort, or skill.

### What are the sources?

Sources of demands at work include the following:

- arduous work
- manual handling of loads
- static activities
- movements and postures
- travel
- exacting physical or mental tasks
- handling stressful work or work situations
- dealing with people
- work requiring balance

These demands come on top of the extra demands of pregnancy, childbirth or breastfeeding, and on top of the work that women traditionally do in the home.

#### Significant sources of occupational fatigue

- **Posture:** standing for more than three hours per day.
- **Work on machines:** work on industrial conveyor belts, independent work on industrial machines with strenuous effort.
- **Physical load:** continuous or periodical physical effort, carrying loads of more than 10 kg.
- **Mental load:** routine work, varied tasks requiring little attention without stimulation.
- **Environment:** significant noise level, cold temperature, very wet atmosphere, handling of chemical substances.
- **Working conditions:** long weekly working hours, alternating shifts.

Source: Mamelie, 1998

## Who can be harmed, and how?

Potential effects of physical and mental demands include:

- increased risks of injury or ill-health due to stress or strain on the woman's body, particularly on her heart, circulatory system, her limbs or her lower back;
- increased risks of anxiety and stress;
- pain and fatigue;
- possible increased risks to the health and development of the unborn child and to the pregnancy.

In particular,

- *Prolonged sitting or standing* can lead to backache and circulatory problems and are linked to possible increased risks of blood clots, miscarriages, premature birth, and low birth weight.
- *Postural problems* can do lasting damage and cause severe pain.
- *Over-exertion* can cause breathlessness and dizziness and may place excessive strain on the heart and circulatory system, with risks to both mother and child. It can also cause excessive heating of the body, and therefore of the foetus.
- *Prolonged stress* has been linked to possible increased risks of high blood pressure (and related risks of pre-eclampsia in some cases), miscarriage and premature delivery. It can also suppress the immune response, leading to reduced resistance to infection.
- *Fatigue* is linked to increased risks of accidents and ill health, including risks of stress and strain and possible increased risks of premature delivery and low birth weight [Mamelle, 1998].

## Who is at risk, and when?

Workers all over the world are affected by hazardous work demands, but the situation is often far worse in poorer countries and unorganized work.

Demands or tasks that may not be very risky at other times can be harmful during and just after pregnancy. The changes in the woman's body during pregnancy can make her more prone to harm from over-exertion and stress or strain until several months after delivery.

There may be additional risks to some workers:

- if they have to deal with several demands at once, or conflicting demands (this can be stressful and can add to the overall load);
- if they are having to do too much, too fast, too repetitively, too often or too intensively;
- if the job, equipment or workstation is poorly designed;
- if they have a poor work environment.

### POINTS TO REMEMBER: Physical and mental demands

- ▶ Both mental and physical demands can be harmful. The hazards are not confined to physical exertion involving "explosive effort" (such as heavy lifting).
- ▶ Pregnancy, childbirth and breastfeeding make demands on the woman too.
- ▶ Both the woman and the child can be harmed by over-exertion, stress and strain.

## Working conditions

Working conditions include terms and conditions of employment, working time arrangements and organizational working practices. They can affect health during pregnancy as well as the mother's ability to continue to breastfeed when she returns to work.

### What can cause harm, and how?

Even where the workplace itself is safe, some working time arrangements can be a problem for pregnant and nursing women and women who have recently given birth. The timing, length and flexibility of shifts and breaks are all important. Examples include:

- Long or excessive working hours (including compulsory overtime)
- night work or rotating shift work
- early starts and late finishes
- inadequate or inflexible breaks
- lack of nursing breaks

Long hours combined with intensive or arduous work can increase risks of fatigue and exhaustion. They can also aggravate other problems, such as risks from manual handling, postural strain or hazardous exposures.

Inflexible piecework systems, intensive workloads, lack of control over the pace of work, or inability to take rest or toilet breaks when needed, can increase physical and mental stress and strain.

**Table 5. Working conditions: Some hazards and potential effects**

Hazard	Potential risks and effects
Night work and rotating shifts	<ul style="list-style-type: none"> <li>• Increased risks of fatigue and exhaustion with risks to mother, especially in late pregnancy and after the birth</li> <li>• Linked to possible increased risks of menstrual disorders, subfertility, miscarriage, premature birth or harm to the unborn child [Spurgeon, 2003]</li> </ul>
Long or excessive working hours (including overtime)	<ul style="list-style-type: none"> <li>• Increased risks of fatigue or exhaustion, stress and strain</li> <li>• Possible problems supporting the child/pregnancy</li> <li>• May increase risks of hazardous exposures (with longer periods of exposure)</li> <li>• May further increase risks where work involves postural problems, repetitive movements, prolonged standing or sitting or arduous or intensive workloads</li> </ul>
Difficulties taking toilet breaks	<ul style="list-style-type: none"> <li>• Increased risks of urinary tract or kidney infections and stress (potentially serious effects on health)</li> </ul>
Missed meal breaks, rest or refreshment breaks, long periods without water	<ul style="list-style-type: none"> <li>• Possible increased risks of malnutrition, dehydration, fatigue and exhaustion in the mother, and of developmental problems and low birth weight in the child</li> </ul>
Start and finish times	<ul style="list-style-type: none"> <li>• Can affect women who are suffering from tiredness or nausea</li> </ul>
Lack of access to preventive health care and health checks during pregnancy	<ul style="list-style-type: none"> <li>• Missed opportunities for health promotion and informed preparation for childbirth and infant care/feeding</li> <li>• Prevents early detection and prevention of complications</li> </ul>
Inadequate maternity leave and returning to work too soon after delivery	<ul style="list-style-type: none"> <li>• Increases risks to mother and child before and just after birth</li> <li>• May increase risks of acute complications after birth as well as longer-term consequences, such as infection, uterine prolapse, anaemia, malnutrition and mental health problems</li> </ul>
Lack of nursing breaks	<ul style="list-style-type: none"> <li>• May prevent continued breastfeeding on return to work, with health risks to mother and child</li> </ul>

Inadequate maternity leave both before and after the birth, or not being allowed to take sick leave if there are medical complications, can increase risks to mother and child. Preventive care is important: it can help to detect and avoid later complications.

### Who is at risk, and when?

All workers are at risk if their working conditions are hazardous, but:

- expectant, new and nursing mothers can be particularly vulnerable, especially just before and just after delivery, or if there are complications of pregnancy or childbirth;
- some hazardous working conditions (such as excessive working hours) can affect men and women's general and reproductive health before conception.

Excessive demands or production targets are not the only source of fatigue and stress. Monotonous, repetitive work, and lack of control over work can also cause problems.

Women in precarious employment may be particularly vulnerable to stress at work. There are special risks for domestic workers and home workers, and for many women working in the informal economy, casual jobs or bonded labour. They are especially vulnerable to exploitation and abuse. With a few exceptions, they are unorganized and lack employment protection and maternity rights. Their working conditions are poorly regulated, if at all. Migrant workers are also at increased risk: the work environment and working practices may be unfamiliar, with possible cultural or language barriers, discrimination and insecurity.

#### Rest and recovery time: The benefits

*Rest is an important preventive measure. It helps the woman:*

- adjust to pregnancy and effects of early pregnancy symptoms (e.g. nausea and tiredness)
- support her pregnancy
- stay healthy at a time when her pregnancy and her child are making extra demands on her body
- avoid the risks of fatigue
- resist infection and disease (by protecting her immune system)
- prepare for childbirth and safer delivery
- recover from the effort of delivery, avoid risks of further fatigue, and restore her natural resources
- produce sufficient breastmilk to feed her baby
- return to work fit and healthy

*By helping the woman, it also helps the child to:*

- develop fully in the mother's womb
- get ready for its birth and become strong enough to survive outside the womb
- obtain the essential nourishment it needs to grow during pregnancy and breastfeeding

#### POINTS TO REMEMBER: Working conditions

- ▶ Night work and shift work may harm the mother or the child. The woman should be fully consulted about her working conditions.
- ▶ Enabling the woman to make healthy choices at work helps her combine her work and reproductive role without extra risks.
- ▶ Making it possible for women to continue healthy breastfeeding on return to work benefits both mother and the child.

## Workplace safety and hygiene

Some aspects of the workplace itself are important for general protection, but particularly important for expectant and nursing mothers. Improvements here are likely to benefit everyone. General workplace health safety and hygiene issues include:

- sanitation and general hygiene
- washing and changing facilities
- drinking water, refreshment and eating areas
- emergency procedures and first aid
- security arrangements
- nursing facilities

### Workplace problems: Examples

- Inadequate, unsuitable or unhygienic sanitation (toilets/latrines)
- Unhygienic washing or changing facilities
- Unsafe drinking water
- Unclean eating and refreshment areas (e.g. near soiled toilets or in dirty or contaminated workspace)
- Lack of suitable rest area (noisy, unclean, unsheltered, uncomfortable or smoke-filled)
- Inadequate first aid, locked or blocked fire exits and escape routes
- Lack of hygienic, quiet and private facilities for breastfeeding or expressing and storing breastmilk

### Sanitation, washing and changing facilities, and general hygiene

Lack of suitable sanitation, washing and changing facilities and poor general hygiene is a general health risk as well as a risk to reproductive health. The risks of infection, contamination, discomfort and stress are greatly increased:

- if facilities are absent, inadequate or unsuitable;
- if workers are not allowed to wash their hands or go to the toilet when necessary, or face fines for doing so;
- if there are no separate toilets for men and women;
- if the facilities are dirty and unhygienic.

### Drinking water, refreshment and eating areas

Unsafe drinking water and contaminated industrial water supplies can also increase risks of infection and contamination.

- Risks increase if workers have to eat or drink in dirty work areas.
- Risks of dehydration and heat stress increase if there is no ready access to safe drinking water.

Indoor air pollution can be a significant risk, even away from work areas. Tobacco smoke is a known reproductive hazard, but is common in rest rooms and canteens and in accommodation units.



## Emergency procedures and first aid

Emergency procedures and first aid at work are also important.

- If a woman has restricted mobility (for example, in the late stages of pregnancy or after a Caesarean delivery) or works alone or in a remote area, she may be particularly vulnerable in a medical emergency or fire.
- Lack of first-aid facilities, or restricted access to them, can increase risks of infection or injury if there is an accident at work.
- If first-aid and medical facilities are unavailable, she may be unable to get the help she needs if there are complications of pregnancy.

## Security arrangements

Security arrangements (or lack of them) can mean special risks for women.

- Harassment or strip-searching of women by security guards in some workplaces can increase stress and raise blood pressure and anxiety to harmful levels during pregnancy.
- Security barriers, such as turnstiles, can be inaccessible or cause pain or injury in later pregnancy.
- Lone working or lack of workplace security can make women more vulnerable to violence.
- Lack of secure travel and transportation can increase vulnerability to robbery and crime, including sexual assault or rape. The woman may be less able to escape from attackers.

## Nursing facilities

The most recent global recommendation of the World Health Organization concerning breastfeeding (WHO, 2000) recommends six months of exclusive breastfeeding (that is, only breastmilk for the first six months) and continued breastfeeding with appropriate complementary foods for up to two years. For working women, who often must return to work when the baby is much younger than 6 months, achieving this ideal may be difficult.

Breastfeeding has major benefits for both the mother and child. Employers can also benefit as the better health of breastfed babies can lead to lower absenteeism of their mothers.

It is important that the work environment helps mothers to continue breastfeeding so they avoid the risks of stopping too soon or not feeding at all. Information and advice before the birth can ensure that mothers are aware of the facilities available at the workplace and the options which they can consider. Lack of information about any risks to the child from breastfeeding (including any risks of mother-to-child transmission of HIV) or about the benefits of healthy breastfeeding, means women may not make informed choices about breastfeeding.

“ Mothers need facilities where they can breastfeed or express and store breast milk. The requirements for such facilities are that they are safe, clean and private. The requirements are similar to those for preparing safe food: that they are clean and have clean water available for washing hands and manipulating utensils. ”

Source: WHO, 2000

Convention No. 183 on maternity protection states that the daily breaks or the reduction in hours of work to breastfeed should be counted as working time and remunerated accordingly. Legislation in at least 92 countries provides for such breastfeeding breaks for nursing mothers. The time foreseen is at least one hour, sometimes in two 30-minute breaks.

If the mother is bringing the baby to the workplace, it is important to ensure the baby is safe and not exposed to harmful substances (which may be in the environment or on the mothers' clothes) or to unhygienic conditions. Mothers should be informed of any risks and precautions taken to avoid them.

When the baby cannot be brought to work and is not nearby, in order to continue breastfeeding on return to work, some women are using breastfeeding breaks for expressing milk. The mother can use breastfeeding breaks to express milk for safe storage and later use if appropriate facilities are available.

Unhygienic conditions, such as using the toilets, can make breastfeeding unsafe due to infection risks.

### Some benefits of breastfeeding

#### *For mothers:*

- Breastfeeding right after birth makes the uterus contract, preventing excessive blood loss.
- Exclusive breastfeeding helps in delaying a new pregnancy. By delaying the return of monthly periods, breastfeeding helps build iron reserves and reduces the risk of anaemia.
- Breastfeeding reduces risk of breast and ovarian cancer.
- Breastfeeding avoids expenditure on breast milk substitutes.

#### *For the babies:*

- Breastfeeding stimulates and strengthens the development of the child's immune system.
- The mother's antibodies pass to the child in her breastmilk, helping it to resist infection.
- Breast-fed babies do not suffer as much from diarrhoea, respiratory and middle-ear infections as artificially-fed babies.
- Breastfeeding avoids the risk of unclean water which may be used for milk fed in bottles.
- Breastfeeding strengthens the bond between mother and child.

Source: Maternity Protection Coalition, 2003

### DID YOU KNOW?

- Breast-fed babies are up to five times less likely to suffer from diarrhoea or be admitted to hospital in early life than bottle-fed babies, have healthier immune systems, and are less likely to develop infections, obesity or allergies.
- Breastmilk alone normally provides all the nutrition a baby needs for healthy growth in the first six months of life and helps it develop well.

Source: UNICEF, WABA



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## 5. Occupational risks in different sectors

This section:

- lists reproductive hazards in particular jobs or industries
  - looks at how general hazards in these areas may impact on reproductive health
- 

Reproductive health risks exist in all types of work. The hazards and risks depend on the nature of the job, the type of workplace and the steps taken to protect workers. This section looks at hazards in the following sectors:

- Agriculture, farming, floriculture and forestry
- Call centres and contact centres
- Chemicals and pharmaceuticals
- Cleaning, including laundries and dry-cleaning
- Clothing, footwear, textiles and toy making
- Construction and mining
- Health care and social care
- Hotels, catering and tourism
- Manufacturing and assembly work
- Retail trades, shops

The selection covers some sectors grouped together because there are similar hazards and some work traditionally done by women.

The information on hazards is presented in tables with accompanying notes. The tables show some general issues affecting reproductive health in these workplaces as well as specific reproductive hazards. The hazards shown are not the only ones to be found in these sectors, and the occupations shown are not the only ones at risk. They are for general illustration only and are not exhaustive. Every workplace is different and, even within a sector, some are much safer and healthier – or more hazardous – than others.

Further information about chemical hazards in specific sectors is provided in the annexes. A list of chemicals that are known or suspected reproductive hazards in the semiconductor industry can be found in Annex 6, and in pesticides in Annex 8. More detailed information about particular hazards and risks and how to avoid them can be found in Annex 2.

### POINTS TO REMEMBER: Occupational risks

- ▶ Reproductive risks are not confined to women.
- ▶ Work often involves several hazardous exposures at once, increasing the risks.
- ▶ New problems are emerging with changing patterns of work.
- ▶ Pregnant and nursing workers may be at particular risk from general workplace hazards as well as from reproductive hazards.
- ▶ Eliminating hazards from the workplace can make work safer and healthier for all workers.

## Hazards in agriculture, farming, floriculture and forestry

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Chlamydia psittaci (from infected birds and sheep during lambing)</li> <li>• Listeria (from infected animals and unpasteurised milk)</li> <li>• Toxoplasma (by hand-to-mouth contact with infected animal faeces, poorly washed garden produce, infected meat)</li> <li>• Hepatitis C (by hand-to-mouth contact and from eating poorly washed garden produce)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Pesticides and other agrochemicals, defoliants and timber treatments</li> <li>• Drugs, antibiotics and hormones (for animals and veterinary treatments)</li> <li>• Dyes (floriculture) and fertilizers</li> <li>• Solvents and disinfectants</li> <li>• Toxic fumes (from silage, etc.) and dusts</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Non-ionizing radiation (strong electromagnetic fields from equipment and overhead power lines)</li> <li>• Shocks and jolts (from animals, bumpy transport or equipment use, and movements involving impacts, e.g. threshing, pounding, chopping, hitting, jumping)</li> <li>• Vibration (directly or indirectly transmitted through transport on rough terrain or animals, or work equipment, e.g. some threshers, harvesters and conveyor belts)</li> <li>• Noise (from work equipment, explosions, animals, generators and other sources)</li> <li>• Extremes of heat and cold</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous or strenuous workloads</li> <li>• Extensive manual handling and load bearing (e.g. water, wood, crops)</li> <li>• Postures (standing, squatting, twisting, bending, reaching, stooping)</li> <li>• Repetitive strain (e.g. chopping, picking)</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts, compulsory overtime</li> <li>• Seasonal variations affecting temperature, weather and exposure to elements</li> <li>• Insecurity and stress (violence, harassment, crop failure, land mines, etc.)</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Hygiene problems, inadequate sanitation, lack of washing facilities, lack of safe water supply for hand washing or clothes washing</li> </ul>

### Unsafe exposures

- Infection risks and exposure to hazardous substances, e.g. zoonoses, pesticides, including contaminated groundwater and hand-washing of work clothing contaminated with pesticides at home or at work.
- Protective equipment may not fit.
- Flooding increases risk of contamination of land, living quarters, produce and water supplies.
- Some agrochemicals can be absorbed through the skin (on clothing, contaminated equipment or in water), by inhalation (when spraying) or by ingestion (on foodstuffs, in water or hand-to-mouth).
- Temperature problems can be aggravated by “wet work”, outdoor work, lack of suitable shelter, working times (early starts and late finishes), seasonal activities (lambing in snow or harvesting in sun) or seasonal variations (monsoon, floods, droughts, etc.).
- Physical hazards include rough terrain, off-road transport, standing in water and working with animals.

### Arduous work, manual handling and postures

- Extensive manual handling and postural problems, especially for workers in fields and plantations. Long hours increase risks of physical strain, fatigue and exhaustion.

### Working conditions and the workplace

- Lack of clean areas, sanitation and washing facilities increases risks of cross-infection and contamination.
- Lack of safe drinking water can increase risks of infection, and women may have to carry water long distances.
- Remote terrain or rural areas may prevent access to health clinics or emergency services.

## Hazards in call centres and contact centres

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Bacteria and viruses (general risks from shared work equipment, poorly maintained air conditioning)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Indoor air pollution, risk of toxic fumes from work equipment and heating systems</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Noise</li> <li>• Extremes of heat and cold</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Intensive workloads/demands</li> <li>• Prescriptive work/scripts</li> <li>• Repetitive work and movements</li> <li>• Prolonged sitting, static load</li> <li>• Awkward postures, restricted movements</li> <li>• Difficult or abusive calls</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours</li> <li>• Shift work, night work or early starts</li> <li>• Compulsory overtime</li> <li>• Lack of flexibility, time constraints, electronic monitoring</li> <li>• Lack of control over flow or pace of work</li> <li>• Lack of rest breaks or toilet breaks</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Difficulty accessing toilets or drinking water (physical time constraints)</li> <li>• Lack of rest and eating facilities or first aid</li> </ul>

### Technology and workstation design

- Shared headsets and mouthpieces and crowded office space with poor ventilation may increase risks of infection.
- Poor workstation design and poor ergonomic fit in pregnancy can increase risks of postural problems and musculo-skeletal disorders (MSDs), repetitive strain and stress.
- Automated call distribution systems and electronic performance monitoring and difficult or abusive calls can be very stressful.
- Restricted movement and limited rest or toilet breaks can increase risks of ill health in pregnancy.
- Indoor air pollution and overcrowded workspace can reduce amount of oxygen in the air and increase carbon dioxide levels.
- There is conflicting evidence about possible risks from electromagnetic fields and other emissions from work equipment. Recent research has found that low-emission computer screens are not linked to increased risk of miscarriage [WHO].

### Workplace design

- Poor workplace layout and overcrowding can increase risks of trips and falls during pregnancy.
- Dehydration and working temperatures that are uncomfortable for pregnant workers can be aggravated by poor workplace design, poor ventilation and overcrowding.

### Organizational working practices and job design

- Organizational working practices can mean that call handlers are highly restricted at work.
- Very high stress levels reported in this sector have been linked to management practices, electronic surveillance, unrelenting workflow and/or abusive callers [Paul and Huws, 2002].
- Restricted postures and prolonged periods sitting are often combined with restrictions on rest and toilet breaks.
- Call centres serving global markets operate across different time zones. Shift work is required.
- Typically the movements, workloads and call handling times of workers are strictly monitored and workflow is controlled by technology rather than by individuals or teams.

## Hazards in the chemical and pharmaceutical industries

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Infection risks from animals used in research laboratories</li> <li>• Risks from unsafe water, effluent and dirty toilets, lack of clean washing facilities</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Chemicals that can cause reproductive harm, in various forms and during different stages of the manufacturing process, including those used in research laboratories</li> <li>• Toxic fumes from fuel, heated substances, treatments, mixing, disposal and cleaning and from industrial boilers, chimneys, etc.</li> <li>• Air pollution and environmental pollution (gases, effluent, contaminated soil or water)</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Shocks and jolts from machine impacts</li> <li>• Vibration from operating, or working in direct contact with industrial equipment</li> <li>• Noise (from noisy work equipment and noisy environments)</li> <li>• Extremes of heat and cold (from exposure to the elements, machine areas, sources of heat and steam, use personal protective equipment, lack of indoor ventilation)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous or strenuous workloads, wet work</li> <li>• Manual handling and load bearing (in supplies, stores, preparation, treatment, mixing, production, packing, warehousing and dispatch areas)</li> <li>• Awkward movements and postures, prolonged standing, sitting or squatting</li> <li>• Repetitive movements, cumulative strain</li> <li>• Poor ergonomic fit with work equipment or workstations</li> <li>• Intensive workloads, exacting work combined with demanding production targets</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts</li> <li>• Lack of rest and/or meal breaks</li> <li>• Restricted access to toilets and washrooms</li> <li>• Lack of control over pace and flow of work</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Contaminated areas, unsanitary toilets and eating areas (or none)</li> <li>• Inadequate sanitation, lack of washing facilities, unsafe water supply (greater risks)</li> </ul>

### Unsafe exposures

- Chemical exposures can be particularly hazardous in these sectors and can contaminate the environment and water supply as well as skin, air and clothing, unless properly contained.
- Some substances used in pharmaceutical products or chemical processes may disrupt hormones, cause infertility or increase risks of cancer, affecting men and women's reproductive health before conception as well as afterwards.
- Problems can be aggravated by inadequate exhaust ventilation, or lack of suitable protective equipment or clothing for pregnant and nursing women.

### Demands, strenuous work and postural problems

- Ergonomic problems are likely during pregnancy due to manual handling, repetitive movements and postural strain. Work can be repetitive as well as strenuous.
- Poor ergonomic fit in pregnancy can contribute to risks if workstations, work equipment and personal protective equipment are not adjustable to accommodate changing body shape, size and individual needs.

### Working conditions and workplace issues

- Long working hours, shift work and continuous processes can mean restricted breaks, fatigue and increased levels of exposure to hazardous substances.
- Lack of clean washing and decontamination facilities can increase risks of wider contamination of living quarters, affecting the breastfeeding child and the community at large.

## Hazards in cleaning, waste disposal and laundries

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>Bacteria and viruses (from all sources including soiled nappies and bedlinen, contaminated clothing, overalls, rotting food, materials, from contaminated items, including syringes, scalpels or other sharps left in laundry or rubbish, vermin, etc.)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>Solvents, dry cleaning fluids and spot cleaners</li> <li>Any tasks involving exposure to chemical agents in workplaces (including spillage, residues, contaminated clothing, surfaces or equipment, etc.) or handling chemicals</li> <li>Dust and fibres</li> <li>Fumes (e.g. from cleaning products, industrial processes, tanks, spillages)</li> </ul>
Physical	<ul style="list-style-type: none"> <li>Ionizing radiation (special risks in nuclear establishments and laundries serving contaminated areas)</li> <li>Vibration, jolts and shocks from work equipment (e.g. polishers, machines)</li> <li>Noise (from noisy equipment and work environments)</li> <li>Extremes of heat and cold (from unheated buildings, outdoor exposures, heat sources such as ovens, steam processes, industrial machines and hot work)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>Intensive workloads and demands</li> <li>Strenuous or awkward manual handling</li> <li>Repetitive work and movements</li> <li>Prolonged standing, static load</li> <li>Awkward postures, restricted movements</li> <li>Working at heights, climbing</li> <li>Stressful targets and time constraints</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>Long or unsociable working hours</li> <li>Shift work, night work, early starts</li> <li>Lack of rest breaks and toilet breaks</li> <li>Precarious employment, insecurity (stressor)</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>Difficulty accessing toilets or water</li> <li>Lone working</li> </ul>
<p><b>Unsafe exposures</b></p> <ul style="list-style-type: none"> <li><i>Cleaners</i>: infection risks in industrial cleaning, hospitals, hotels, public toilets, rat-infested areas and areas involving contact with animals (dead or alive), blood, animal faeces and bird droppings; risks of hazardous exposures in industrial cleaning; risks to family members and the child from toxic dusts and fibres carried on clothing, or from ionizing radiation.</li> <li><i>Waste disposal</i>: risks of infection from contaminated areas, decaying rubbish, vermin.</li> <li><i>Laundries and dry cleaners</i>: infection and contamination risks in hospital and industrial laundries and from dry cleaning fluids, and from excessive heat and steam.</li> <li>Poor ventilation and air pollution can reduce oxygen supplies to the woman and unborn child.</li> </ul> <p><b>Arduous work, manual handling and postures</b></p> <ul style="list-style-type: none"> <li>Arduous work often involving strenuous and awkward manual handling.</li> <li>Tasks involve extensive movements (bending, stretching, reaching, pushing, lifting, stooping, etc.).</li> <li>Wet loads can be particularly heavy.</li> <li>In all tasks, repetitive effort also involves extensive effort and exertion.</li> <li><i>Laundry workers</i> have particular problems standing for long periods, even in automated laundries.</li> <li><i>Cleaners</i> may have problems bending or working at heights or in confined spaces.</li> </ul> <p><b>Working conditions and workplace issues</b></p> <ul style="list-style-type: none"> <li>Lone working, night work, late evenings and early starts are common.</li> <li>Unsanitary conditions are common, with particular problems in outdoor work.</li> <li>Lack of information about hazards is common among cleaners.</li> </ul>	



## Hazards in the clothing, footwear, textile and toy industries

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Infested factories, warehouses, drains, storage areas and roof spaces (birds, pests and rats) and animal skins</li> <li>• Risks of unsafe water and contamination</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Industrial chemicals (e.g. dyestuffs and finishing agents, solvents, dry-cleaning fluids, spot-cleaners, caustic substances, adhesives and fixatives)</li> <li>• Lead and lead derivatives in paints, metals and soldering in toymaking</li> <li>• Dust, animal hairs, fur and other fibres</li> <li>• Toxic fumes from heated substances, treatments, sprays and boilers</li> <li>• Vinyl, plastics, paints, coatings and flame-retardants</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Shocks and jolts (e.g. cutting machines, treadles, pressers, moulds, tanning equipment), other sudden movements involving machine impacts</li> <li>• Vibration from operating, or working in direct contact with industrial sewing machines and other machinery and equipment</li> <li>• Noise (from work equipment, machines, and noisy environments)</li> <li>• Extremes of heat and cold (from exposure to the elements, climatic conditions, industrial washing, heat and steam, lack of indoor ventilation)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous and strenuous workloads, wet work</li> <li>• Manual handling and load bearing (e.g. treadles, skins, bales, materials, clothes)</li> <li>• Awkward postures, prolonged standing, sitting or squatting</li> <li>• Repetitive forceful movements, strain (e.g. weaving, machining, pressing, knitting)</li> <li>• Poor ergonomic fit with work equipment, restricted movement or workspace</li> <li>• Intensive workloads, exacting work plus demanding production targets</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts</li> <li>• Compulsory overtime, poor or non-existent leave arrangements</li> <li>• Harassment, intensive pressure, job insecurity, arbitrary dismissal</li> <li>• Punitive fines, strict monitoring and piecework payment systems</li> <li>• Lack of rest and/or meal breaks, restricted access to toilets and washrooms</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Contaminated areas, unsanitary eating areas (or none)</li> <li>• Inadequate sanitation, lack of washing facilities, unsafe water supply</li> <li>• Overcrowding, inadequate fire precautions, first aid or emergency procedures</li> </ul>
<p><b>Unsafe exposures</b></p> <ul style="list-style-type: none"> <li>– Risks of chemical exposures (including hazardous vapours) vary depending on the tasks, trade and treatment processes involved (e.g. use of lead in toy making, heating of chemicals and materials).</li> <li>– Unsafe industrial water may be used for washing materials and may be further contaminated by chemicals.</li> <li>– Extremes of heat and cold occur where activities involve “wet work”, outdoor work or particular processes (e.g. dyeing, washing, steaming and pressing).</li> <li>– Problems can be aggravated by lack of ventilation, heating or lack of protective clothing.</li> </ul> <p><b>Intensive demands, strenuous work and postural problems</b></p> <ul style="list-style-type: none"> <li>– Work in this sector is strenuous even when carried out sitting down (e.g. intensive workloads involving repeated use of lateral force when machining or weaving), postural and repetitive strain.</li> <li>– Prolonged sitting combined with intensive workloads may increase risks in pregnancy.</li> </ul> <p><b>Working conditions and workplace issues</b></p> <ul style="list-style-type: none"> <li>– Excessive working hours, compulsory overtime, piecework, intensive pressures, unrealistic production targets, restricted rest and toilet breaks, job insecurity and harassment (by security guards and others) significantly increase risks of stress and strain in some factories.</li> <li>– Obstacles and overcrowding increase risks of injury in fire and also risks of slips, trips and falls for heavily pregnant women.</li> <li>– Unsanitary conditions may make contamination of food, eating and living areas more likely.</li> <li>– Homeworking is common in clothing and footwear, increasing risks in the home.</li> </ul>	

## Hazards in construction and mining

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Psittacosis and toxoplasma risks from infected animal faeces, insects and bird droppings in derelict sites and roof spaces</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Derelict land and disused agricultural land or defoliated areas, timber treatments and preservation work (risks from pesticides, defoliants, industrial chemicals, preservatives and other hazardous substances)</li> <li>• Toxins in building materials, chemical treatments, paints and coatings</li> <li>• Toxic fumes, gas, hazardous dust and fibres (from heated substances, paints, coatings, insulation or diesel fumes, and during construction, demolition, painting, timber treatments, insulation work and refurbishment)</li> <li>• Contaminated water and land may contain toxins</li> </ul>
Physical agents	<ul style="list-style-type: none"> <li>• Ionizing radiation (from contaminated soil or materials)</li> <li>• Shocks and jolts from bumpy transport or equipment use, or movements involving impacts (pounding, digging, chopping, hitting, stone-breaking, pile-driving, etc.)</li> <li>• Vibration (directly or indirectly transmitted through transport or work equipment, or when transporting materials over rough terrain or transport with poor suspension, operating or working in direct contact with drills, pile-drivers, chainsaws and conveyor belts)</li> <li>• Noise from work equipment, explosions, generators, etc.</li> <li>• Extremes of heat and cold (from exposure to the elements or lack of indoor ventilation)</li> <li>• Hyperbaric conditions (underground mining)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous and strenuous workloads</li> <li>• Manual handling and load bearing (e.g. water, soil, coal, slack, building materials, bricks, stones, work equipment)</li> <li>• Awkward postures, confined spaces</li> <li>• Repetitive forceful movements, strain</li> <li>• Working at heights, working underground</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts</li> <li>• Compulsory overtime</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Inadequate sanitation, lack of washing facilities</li> <li>• Lack of safe water supply</li> </ul>

### **Sectoral risks in both construction and mining**

- Extensive risks from heavy labouring, dangerous working environments and prolonged exposure to hazardous substances.
- Risks from exposure to extremes of heat and cold, wet work, toxic dusts, fibres, gas and fumes, vibration, shocks, jolts, strenuous manual handling, postural problems, exertion and strain.
- Risks of extreme temperatures aggravated by wet work, outdoor work and lack of suitable shelter or protective clothing.
- Risks may be aggravated by working hours and shift patterns (early starts and late finishes) and by seasonal conditions (monsoon, floods, droughts, heat waves).
- Significant risks of slips, trips and falls, other accidents and from climbing or working at heights.

### **In construction**

- Extensive risks from hazardous substances in many forms.

### **In mining**

- Risks from working underground and in confined spaces.
- Risks from poisonous gases, toxic fumes and sudden explosive noise, manual handling and postural problems.

In some countries, women do most of the heavy labouring jobs in construction. Some chemicals (and irradiated materials) can remain in contaminated land and water and contaminate the environment for future generations: this may affect risks in demolition works, refurbishment projects, “brownfield” sites and war zones. Some national laws prohibit underground work during pregnancy.

## Hazards in health care and other social and residential care

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Communicable diseases (including HIV, rubella, hepatitis, TB, etc.)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Some drugs, including those used in cancer treatments</li> <li>• Hazardous substances, including lead and lead derivatives, mercury, various chemicals used in laboratories, operating theatres and post-mortem rooms (including formaldehyde and anaesthetic gases, hazardous substances used in cleaning, sterilizing and other disinfection procedures)</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Shocks and jolts (e.g. from restraining disturbed or violent people)</li> <li>• Vibration (from equipment and transport)</li> <li>• Extremes of heat and cold (heat and steam in kitchens and autoclaves, or refrigerated areas in mortuaries)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous and strenuous workloads</li> <li>• Manual handling and load bearing</li> <li>• Postural problems</li> <li>• Awkward or extensive movements</li> <li>• Intensive, stressful workloads</li> <li>• Dealing with people and emergencies, often in difficult situations</li> <li>• Making clinical decisions</li> <li>• Managing people, treatment and care</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts</li> <li>• Night work</li> <li>• Understaffing</li> <li>• Violence</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Contaminated or infected areas</li> <li>• Possible problems resulting from lack of facilities or support for ambulance workers and other people working away from base or in the community</li> </ul>

### Unsafe exposures

- Extensive exposure to possible risks of infection and hazardous substances. Protective clothing and equipment is essential in some areas, but may not fit during pregnancy.
- Medical tests and treatments can involve significant risks (e.g. diseases, drugs and other chemicals, ionizing radiation, X-rays, etc.).
- Support staff, emergency workers and allied professions are at risk, not just medical teams.

### Arduous work, manual handling and postures

- Extensive risks of musculo-skeletal injury from handling sick, injured or disabled people, and from handling laundry, equipment and other loads in hospitals or homes.
- Work can involve intensive mental and emotional demands, especially in emergencies and life-threatening situations or supporting others in difficult situations and lead to stress.

### Working conditions and workplace issues

- Lack of access to clean water and hygienic washing facilities and hygienic sanitation can increase cross-infection risks in all areas of health care, including community settings.
- Long hours, shift work and night work can increase the risk of fatigue.

## Hazards in hotels, catering and tourism

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>Bacteria and viruses (from all sources including foodstuffs, bedding, waste, dirty toilets, discarded condoms, needles, nappies, sanitary towels, etc.)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>Any tasks involving exposure to chemical agents in workplaces (including spillage, residues, contaminated clothing, surfaces or equipment, etc.) or handling chemical cleaners</li> <li>Fumes (e.g. from outside or from cleaning products, cooking stoves, boilers) and air pollution</li> </ul>
Physical	<ul style="list-style-type: none"> <li>Ionizing radiation</li> <li>Noise (especially during entertainment and functions)</li> <li>Extremes of heat and cold (working outdoors, in unsheltered areas, in refrigerated areas or near heat sources, such as boilers, ovens or stoves)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>Intensive workloads and demands</li> <li>Strenuous or awkward manual handling (restaurants, kitchens, housekeeping, cleaning)</li> <li>Repetitive work and movements (food preparation)</li> <li>Prolonged standing and/or awkward postures</li> <li>Stressful targets, time constraints</li> <li>Working at heights (store-rooms, cleaning and housekeeping)</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>Long working hours, shift work, night work or early starts</li> <li>Lack of rest breaks or toilet breaks in busy periods</li> <li>Precarious employment, insecurity, seasonal fluctuations, unpredictable demands</li> <li>Requirements for travel and unpredictable working times (tourism especially)</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>Difficulty accessing toilets or drinking water when "on the road"</li> <li>Going up and down stairs (if there are no lifts)</li> </ul>
<p><b>Unsafe exposures</b></p> <ul style="list-style-type: none"> <li>Particular risks of infection in kitchens, food storage areas, bars, toilets, rat-infested areas and areas involving contact with discarded food or kitchen waste.</li> <li>Jobs involving use of hazardous substances in catering establishments (e.g. oven cleaning) or preparation of foods using unpasteurized milk (e.g. soft cheeses) may be particularly risky during pregnancy, depending on the substances involved.</li> <li>Pregnant women suffering from nausea (especially in early stages) may be unable to tolerate certain smells in catering areas.</li> <li>Risks of dehydration and heat stress from work in kitchens, or from extremes of cold in unheated or refrigerated areas.</li> </ul> <p><b>Demands, manual handling and postures</b></p> <ul style="list-style-type: none"> <li>Long periods spent standing up, especially in kitchens, bars, restaurants and reception areas and for housemaids.</li> <li>Significant problems with strenuous manual handling and awkward postures (heavy loads and extensive bending, stretching, lifting, pushing, reaching and twisting).</li> <li>Postural problems may be worsened by ill-fitting uniforms, overalls and constriction.</li> <li>In large buildings without lifts, possible increased risks of slips, trips and falls carrying loads up and down steep stairs.</li> <li>Extensive mental demands in some jobs (e.g. reception and other front-line work), including communications, conflict resolution, organization, decision-making, bookings, tours and sales.</li> <li>Psychosocial risks (e.g. violence, harassment and abuse, stress) from working with the public, handling valuables, enforcing rules and serving alcohol.</li> </ul> <p><b>Working conditions and workplace issues</b></p> <ul style="list-style-type: none"> <li>Long working hours, shift work, early starts and working late into the night.</li> <li>Problems taking rest and toilet breaks in busy periods or when working "on the move".</li> </ul>	

## Hazards in manufacturing and assembly work

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>• Infection risks from unsafe water, unsanitary conditions, infestation and contamination</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>• Chemical products that can cause reproductive harm in various forms (e.g. solvents, caustic substances, fixatives, solders, paints, sprays, foam, coatings, fibres, dusts)</li> <li>• Hazardous raw materials (e.g. metals and fibres, compounds, lead and lead derivatives, mercury, hazardous gases and fumes, and indoor air pollutants)</li> <li>• Toxic fumes from fuel, heated substances, treatments, mixing, coating and from industrial boilers and other plants</li> <li>• Air pollution and environmental pollution</li> </ul>
Physical	<ul style="list-style-type: none"> <li>• Shocks and jolts from machine impacts, transport or falling objects</li> <li>• Vibration from operating or working in direct contact with industrial machinery</li> <li>• Noise from noisy work equipment and noisy environments</li> <li>• Extremes of heat and cold (from exposure to the elements, industrial washing areas, sources of heat and steam, or poor ventilation)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>• Arduous and strenuous workloads, wet work</li> <li>• Manual handling and load bearing (in supplies, stores, preparation, treatment, mixing, production, packing, warehousing and dispatch areas)</li> <li>• Awkward movements and postures, prolonged standing, sitting or squatting</li> <li>• Repetitive movements, cumulative strain, monotonous work</li> <li>• Poor ergonomic fit with work equipment or workstations</li> <li>• Intensive workloads, exacting work with demanding production targets</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>• Long working hours, shift work or early starts</li> <li>• Compulsory overtime, poor or non-existent leave arrangements</li> <li>• Harassment, intensive pressure, job insecurity, arbitrary dismissal</li> <li>• Punitive fines, strict monitoring and piecework payment systems</li> <li>• Lack of rest and/or meal breaks, restricted access to toilets and washrooms</li> <li>• Lack of control over the pace and flow of work</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>• Contaminated areas, unsanitary eating areas (or none)</li> <li>• Inadequate sanitation, lack of washing facilities, unsafe water supply</li> <li>• Overcrowding, inadequate fire precautions, or first aid or other emergency procedures</li> </ul>

### Unsafe exposures

- Physical hazards, such as noise, extremes of heat and cold, and vibration are common.
- Chemical exposures can be very hazardous but vary depending on the substances, work system and production processes.
- Problems can be aggravated by lack of ventilation, lack of suitable protective equipment or clothing (industrial cleaning may also be hazardous).
- Exposure to physical hazards may be closely linked to equipment and workplace design.
- Risks from reproductive toxins in the semiconductor industry (see Annex 6 for list of chemicals and effects on reproduction).

### Intensive demands, strenuous work and postural problems

- Manual handling, postural and repetitive strain problems are common in manufacturing, including repetitive assembly tasks and postural strain.
- Poor ergonomic fit in pregnancy can contribute to risks if workstations, work equipment, protective equipment and job tasks are not adjustable.

### Working conditions and workplace issues

- Excessive working hours, compulsory overtime, piecework, intensive pressures, production targets, restricted rest and toilet breaks, job insecurity and harassment can significantly increase risks.
- Obstacles and overcrowding increase risks of injury in fire and also risks of slips, trips and falls for heavily pregnant women.
- Unsanitary conditions may make contamination of food, eating and living areas more likely.

## Hazards in retail and distribution trades, shops

Hazard	Examples and sources
Biological	<ul style="list-style-type: none"> <li>Bacteria and viruses (from all sources, including raw meat and fish and other foodstuffs, unpasteurized milk and dairy products, dirty toilets, and infested storage or waste disposal areas)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>Handling chemical products (including spillage, residues, contaminated materials, surfaces or equipment, etc.)</li> <li>Indoor and outdoor fumes and air pollution</li> </ul>
Physical	<ul style="list-style-type: none"> <li>Shocks, jolts and vibration from work equipment, such as lift trucks, from falling objects and from transport on rough roads</li> <li>Extremes of heat and cold (working outdoors, by open doors, in refrigerated areas, or in poorly heated or unventilated premises)</li> </ul>
Demands	<ul style="list-style-type: none"> <li>Strenuous or awkward manual handling (all areas, including checkout tills)</li> <li>Repetitive work and movements (shelf-filling, checkouts)</li> <li>Prolonged standing or sitting and/or awkward postures and confined positions</li> <li>Dealing with customers and complaints and handling cash and valuables (risks of violence and harassment, especially at night)</li> <li>Working at heights (stockrooms and warehouses, high shelves)</li> </ul>
Working conditions	<ul style="list-style-type: none"> <li>Long working hours in some outlets, shift work, night work or early starts</li> <li>Lack of rest breaks or toilet breaks in busy periods or when understaffed</li> <li>Requirements for travel and seasonal variations (distributive trades and casual staff)</li> </ul>
Workplace hygiene	<ul style="list-style-type: none"> <li>Difficulty accessing toilets or drinking water</li> <li>Risks of isolation when lone working in small shops or isolated work areas</li> </ul>

### Unsafe exposures

- Particular risks in storage rooms, rat-infested areas and areas involving contact with discarded food, chemicals or waste, or from hazardous spillage.

### Demands, manual handling and postures

- Arduous work with extensive manual handling and ergonomic problems for pregnant women.
- Long periods may be spent standing up or sitting down.
- Manual handling may involve heavy or awkward loads and extensive bending, stretching, lifting, pushing, reaching and twisting.
- Specific problems may be experienced with some work equipment (e.g. trolleys and carts used in large stores or shelf-filling) or with mobility in later stages of pregnancy.
- Postural problems may be worsened by ill-fitting uniforms, overalls and constriction, and by poor ergonomic fit (especially for warehouse packers and check-out operators) or by working outdoors or in markets.
- Possible increased risks of slips, trips and falls, or from working at heights during pregnancy.
- Psycho-social risks from violence, attempted robbery, harassment and abuse, from working with the public, handling cash and valuables, handling customer complaints, etc., may increase risks of stress in pregnant workers.

### Working conditions and workplace issues

- Working hours, shift work, early starts and working late or into the night can increase risks of fatigue from demanding or stressful work and are common in retail trades.
- Rest and toilet breaks in busy periods or when travelling between sites can be particular problems for expectant and nursing workers.
- Increasing use of 24-hour call centres offering on-line shopping and extended customer services (including banking and travel agencies) in industrialized countries is affecting the nature of the job and the risks involved in some retail markets.
- In small retail outlets and for sole traders, lone working and long working hours can be particular problems when workers are pregnant or breastfeeding.





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## 6. Taking action and preventing harm

This section

- outlines some principles of workplace maternity protection
  - explains some of the practical steps that employers, trade unions and others can take to avoid the risks
  - looks at examples of how risks can be avoided
- 

### Principles for action by employers

Employers are responsible for assessing and avoiding risks to workers' health and safety, including any risks at work to reproductive health. This does not mean they have to do it alone. Many others can be involved. Employers' associations, workers, trade unions and safety representatives, health advisors and trainers all have a part to play.

### Benefits of general protection

Maternity protection has changed over the years. In the past, pregnant workers were often excluded from work that could harm them. Now the aim is to avoid reproductive risks by removing the hazards or avoiding harmful exposures and adjusting work to fit the expectant or nursing worker. Without general protection for all, the risks may remain and harm others.

### Principles of prevention

ILO guidance on risk assessment is set out in the publication *Fundamental principles of occupational health and safety*. This highlights the importance of addressing risks at the source [Alli, 2000].

If a significant risk remains, employers should take action to avoid exposing the woman or the child to harm.

#### **Hierarchy of preventive and protective measures**

In taking preventive and protective measures, the employer should assess the risk and deal with it in the following order of priority:

- eliminate the risk
- control the risk at source
- minimize the risk by means that include the design of safe work systems
- in so far as the risk remains, provide for the use of personal protective equipment

Source: Alli, 2000



## Involving and consulting workers, especially women

Remember to consult workers and their representatives or advisors when assessing risks. Workers have direct experience of what the job actually involves and how it affects them. This information, and any information about individual factors, should be considered in the risk assessment. When consulting women workers about pregnancy-related issues:

- be supportive: it is important to talk to the woman sympathetically, in private, or with her friend or representative if she wishes;
- take account of her needs and preferences, and any competent advice received, such as advice from a doctor or other competent authority;
- respect privacy: respect for the privacy of personal health information is vital, from employers, trade unions and health-care providers. Hold conversations in private if requested. She may not want others to know she is pregnant. Sensitive information should be handled confidentially, and should only be disclosed to someone else after consultation and agreement with the worker concerned.

## Involving and consulting others

Participation and involvement of workers, representatives and specialist advisors can provide valuable insight into work-related health. Ergonomists, trade unions and others have developed action-based research methods to find out more. Techniques include “body mapping” and “risk mapping” to find out what is causing problems in the workplace. They do this by working with groups of workers and listening to what they have say in confidential discussions about how the job affects them. Visual images, direct observation and first-hand experiences help to highlight common problems and also differences between jobs.

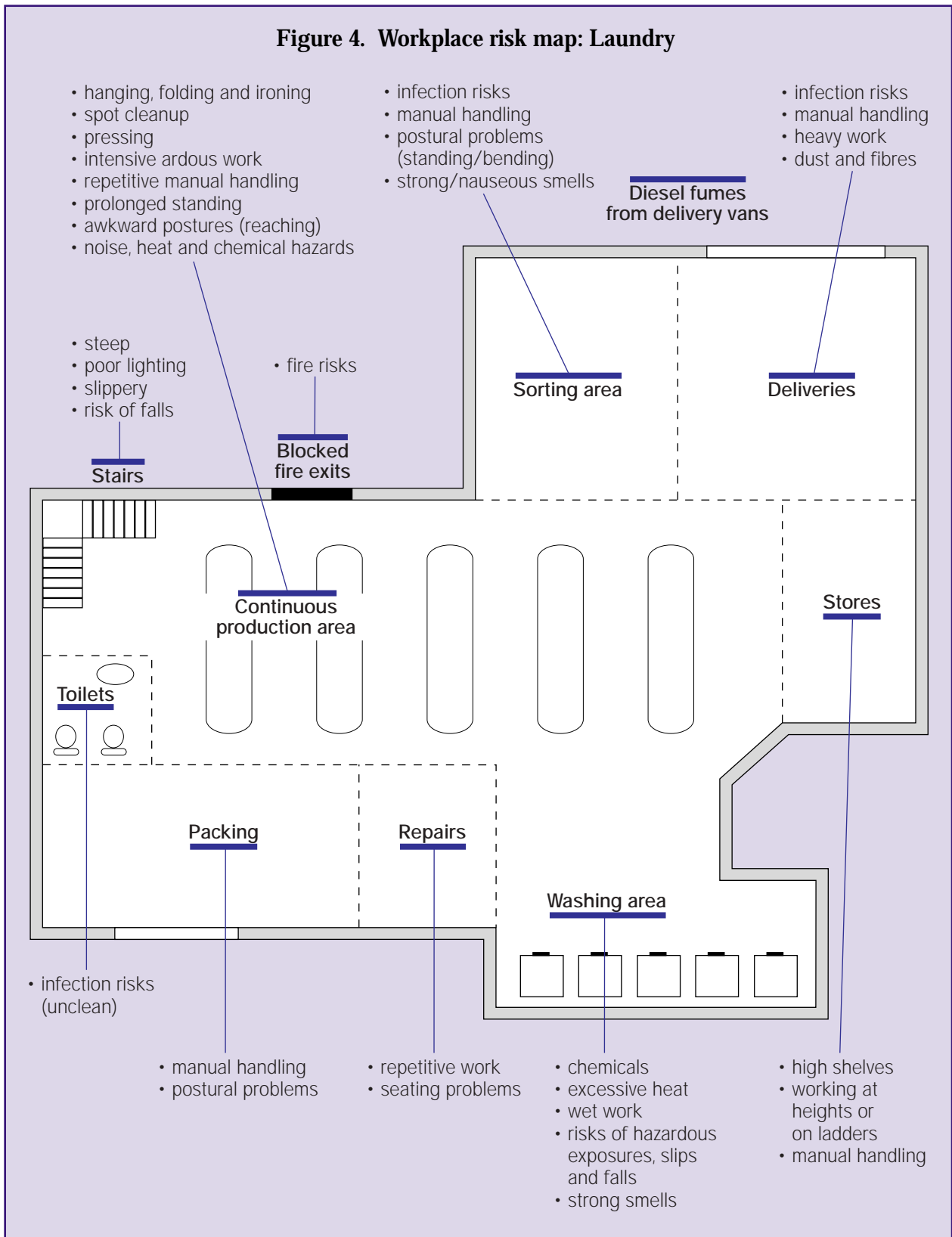
These discussions can also:

- support women in talking about their concerns (through shared experience);
- stimulate useful debates and ideas about improvements that are needed in the workplace, raising awareness all round.

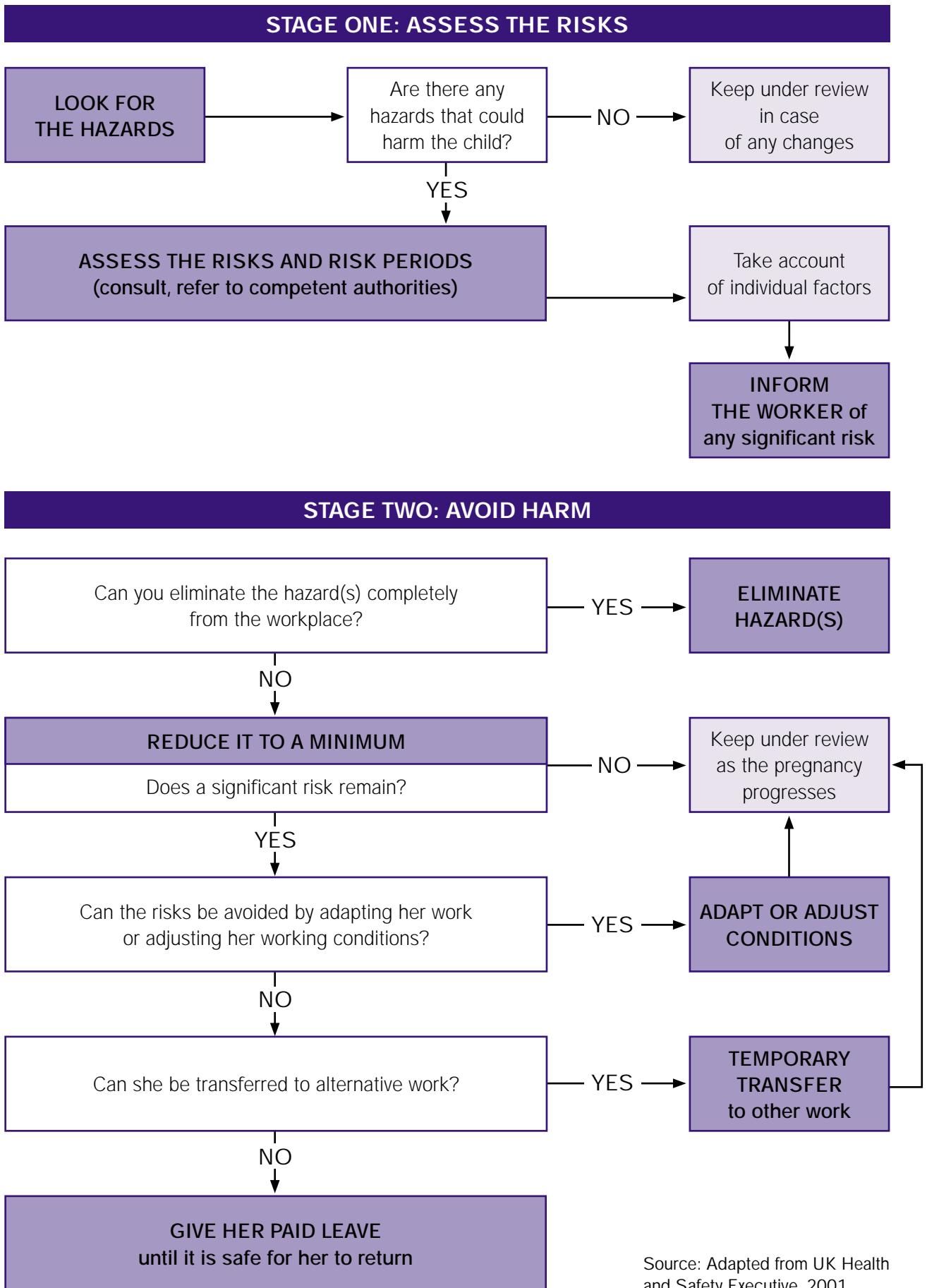
The ILO has published a manual, entitled *Barefoot research: A workers' manual for organising on work security*, explaining in detail what these techniques involve and how to apply them in the workplace. It is highly recommended as a workplace health resource.

By following the step-by-step approach to assessing and avoiding risks outlined in Recommendation No. 191, many problems can be solved, or avoid altogether. The flow chart below illustrates the steps to be taken for maternity protection.

A sample risk assessment form has been included in Annex 4. This can be used to record what the problem is, who is at risk and when, and what precautions should be taken to avoid the risk. This information should be given to the woman and her supervisor or manager. You can then refer to this when you are reviewing the risk assessment at a later stage. You should review the risk assessment when the woman returns to work within six months of having given birth, or if she is breastfeeding when she returns.



**Figure 5. Assessing and avoiding risks**



Source: Adapted from UK Health and Safety Executive, 2001

## Step One: Assessing the risks

The first step is to look for things at work that could harm the health of the woman or her child, and assess the risks. This involves the following steps:

- identify the hazards: what could cause harm, and how?
- identify people at risk: who might be harmed, and when?
- take account of individual circumstances: are there any individual risk factors?
- evaluate the risks: are controls in place to prevent risks? Are they effective?

### Identifying hazards

A hazard is something with the potential for harm. The risk is the likelihood of the harm actually occurring. This depends on whether someone is exposed to harm, and the nature and timing of those exposures, as outlined in Chapter 4. You need to look at the exposures in your particular workplace. Annex 5 lists examples of types of infection risks and exposures; Annex 2 gives some general examples of risks from hazardous exposures. These may be useful for reference.

For general information about reproductive hazards, e.g. about the effects of a particular chemical being used at the workplace, you may need to go outside the workplace to consult specialist sources in your country. Some useful international sources are listed in Annex 9. Individual women workers and their representatives can also get advice and information from a variety of sources, including NGOs, government services on occupational health and safety, and health-care providers.

#### Sources of information and advice outside the workplace

- Scientific and medical institutions
- Government departments and other competent authorities
- Trade unions and trade union researchers
- Occupational health and safety professionals
- Employers' organizations and trade associations
- Manufacturers and suppliers
- Health-care providers
- NGOs, women's organizations and self-help groups
- International agencies and information networks
- Other public sources (e.g. public information, statistics, inspectors)
- Websites (for those with access to the Internet)

Chapter 4 gives general information on different types of reproductive hazards. The checklists in Annex 1 and the information on hazards in particular sectors given in Chapter 5 can be used to help identify work areas or activities that may involve hazardous exposures and possible risks to reproductive health.

## **Workplace health protection: Assessing all the risks**

### **WHAT should be assessed?**

- All workplace hazards and risks of all hazardous work activities or working conditions.
- Work-related risks to the pregnant or nursing woman and her child.
- All work-related risks at all stages.

### **WHO should the assessment cover?**

- All workers for general risks to reproductive health.
- All pregnant or nursing women at work and women returning after recent childbirth.
- The unborn, new-born or breastfeeding child

### **WHERE should assessments be done?**

- All workplaces for general reproductive health risks (everywhere that people work, even temporarily and wherever work activities are carried out), and individuals' workplaces.

### **WHEN should they be done?**

- Generic assessments from the outset (for all risks).
- As soon as possible for individuals, and with specific situations or problems.
- On return to work (if breastfeeding or if the woman has recently given birth).

### **WHO should be consulted?**

- The pregnant or nursing woman and her representative, health worker or medical adviser, as appropriate (plus any relevant advice from competent authorities).
- Other workers and their representatives.

### **WHO should be informed? (in confidence if necessary)**

- The woman and her representative and/or adviser.
- Her manager and/or anyone else who has to monitor her health and the work situation.

### **WHO should be protected?**

- Everyone at risk (if necessary, in cooperation with other employers or premises managers).

Within the workplace, information about reproductive hazards can be gathered in much the same way as for other hazards. Examples include:

- direct observation of work activities and the workplace during walk-through tours or site inspections (these can be recorded on the checklists provided in Annex 1);
- task-based analysis;
- identifying substances and checking whether they are known or suspected to be carcinogenic, mutagenic, toxic to reproduction or have effects on or via lactation.
- monitoring or measuring workplace exposures.

**Note:** There are a number of national and international systems for classifying, labelling and communicating chemical hazards. In consultation with others, the United Nations Economic Commission for Europe (UNECE) has developed the *Globally harmonised system of classification and labelling of chemicals (GHS)* [United Nations, 2003]. This contains harmonized classification criteria and hazard communication elements, but is flexible enough to permit self-classification. The system includes classifications of hazardous substances that are known or suspected to cause harm to reproduction.

Remember that for maternity protection you need to make adjustments to exposure levels to take account of the specific susceptibility of the woman and her child. Discussion with the workers concerned and their representatives would be important. Other sources of information within the workplace include:

- records of workplace inspections
- work records (including sickness absence data and shift arrangements)
- workplace health surveillance and monitoring data
- manufacturers and suppliers information and instructions, including material safety data sheets (MSDs) and labels or warning signs on packaging.

**Note:** Hazardous substances must be supplied with information including adequate labels and safety data sheets. These can be obtained from the manufacturer or supplier. The safety data sheet is a document containing essential information for users regarding the properties of chemicals classified as hazardous, and methods of using them safely, including their identity, supplier, classification, hazards, safety precautions and emergency procedures. The quality of information supplied does vary, and only applies if the manufacturer's instructions are strictly adhered to, but an up-to-date label and a current safety data sheet are the best sources of information on chemicals in the workplace. They should be checked before new substances are introduced to the workplace, and all workers and managers should be informed of the precautions they need to take to avoid risks.

Some hazards, and some causes and effects, are easier to identify than others. Sometimes the first sign that something is causing a problem is when unusually high numbers of reproductive health problems are reported. Or there may be problems of a particular kind (e.g. an increase in miscarriages, childhood cancers or malformations) in one part of the workplace or amongst one group of workers. Some harmful exposures in men can affect the pregnancies of unexposed female partners, so it is important not to overlook the male workers and their partners (see the case study below).

Problems like these should always be investigated to see if anything at work is causing the problem. This may mean looking at different groups and work situations, not just at individuals or individual workplaces. (If there are grounds for suspecting that something is hazardous, you should take precautions to protect people until you know for sure that the work is safe. The cause may not be clear.)

### **Case study: Problems in conceiving**

A 30-year-old pesticide production worker told his doctor that he and his wife were having problems conceiving a second child. A medical examination revealed that he had no sperm in his semen, although his wife showed no abnormality.

The worker told his doctor he was exposed to more than 100 chemicals at work. When the worker discussed the issue with his co-workers, he found that other couples had similar problems. After these discussions, five co-workers agreed to submit semen samples for analyses. These analyses showed that the five men had few or no sperm at all.

The results were sent to another doctor. He had previously advised the local trade union but had not seen the men before. He repeated the test and the results were the same. Further tests by university researchers indicated that this was due to exposure to toxic chemicals at work. One of the chemicals – dibromochloropropane (DBCP) – was produced in the plant in large amounts, and was suspected to be the cause.

Two other plants assessed the problem and found similar results. The link between DBCP exposure and fertility problems was strengthened when it was found to be the only chemical exposure that all three plants had in common. DBCP was later banned in the United States.

Source: Rosskam, 1999

### **Identify people at risk: Who might be harmed, and how?**

To identify people at risk, look at who is exposed to which hazard(s) at work, and at the nature and timing of their exposures. Timing here means two things:

- the timing of the exposures themselves (i.e. how long someone was exposed to a hazard, how often, and over what period);
- the timing of exposure in relation to the reproductive cycle (e.g. exposure to lead while breastfeeding).

People may be at greater risk if they are exposed to hazards

- in ways or environments that make harm likely;
- at a stage (e.g. early pregnancy) that makes them susceptible to particular harm;
- at levels of exposure that produce harmful effects.

Find out whether there are particular risks to a pregnant or breastfeeding woman, an unborn or breast-feeding child, or to men and women wanting to have children. If so, who is likely to be affected, and at what stage are they at particular risk?

### **POINTS TO REMEMBER: Identifying people at risk**

- ▶ Check that all the risks have been assessed.
- ▶ Check for evidence of specific reproductive problems among workers.
- ▶ Take account of all available information, including individual factors and any medical certificate or advice from competent authorities.

## Take account of any individual circumstances

Pregnancies are not all the same. Consultation is vital and it is important to take account of any medical certificates provided. (The checklist for the individual worker in Annex 1 can help to identify particular factors affecting the individual.) Some individuals may be particularly at risk, either because of past exposures or complications, or because of their working conditions and individual circumstance.

Pregnancy is a temporary and changing condition. Work may change too. It is important to keep the situation of the individual worker under review.

- Are there any changes at work that could affect the risks?
- Are any new substances being introduced into the workplace?
- Have there been any changes in her condition or in the precautions she has been advised to take?
- Are there any complications of pregnancy or birth?
- Is the worker continuing to breastfeed on return to work?

## Evaluate the risks

In order to decide whether action is needed, you need to find out whether it is likely that someone will be harmed, and if so, how serious it might be. This will depend on the nature of the hazard and the exposures involved. It will also depend on whether enough has already been done to prevent or control the risk to avoid harm occurring.

If controls are already in place, are they adequate for maternity protection? This is an important question, because (as discussed earlier) the woman or the child may be more susceptible to harm, they may be exposed in different ways, and the risks may be different at this time.

Examples where additional measures are needed because of increased risks during pregnancy include:

- exposure to ionizing radiation or certain chemical hazards
- excessive noise exposure
- working at heights or in pressurized atmospheres
- strenuous work or manual handling
- prolonged sitting and standing

If existing precautions are not adequate for maternity protection, or significant risks remain, further action is needed. The employer should inform the woman and decide how best to protect her and the child.



## Step Two: Avoid the risks

To avoid the risks, apply the principles of prevention and maternity protection. Look for ways to avoid risks in the following order of priority:

- Can you eliminate it completely from the workplace?
- If not, can you reduce it to minimize the risk?
- If a risk remains, can you adapt work or working conditions to avoid the risk?
- If not, or if a risk remains, can you transfer the worker temporarily to another post?
- If this is not feasible, give the woman paid leave until it is safe for her to return.

The final option of exclusion from the workplace is a last resort, to be chosen only *after* all other measures have been considered. Some ideas are given below.

Eliminating the risk completely from the workplace is the best option, as it protects other workers and also future pregnancies. Even if this is not possible, you may be able to minimize it by using risk controls and preventive measures. Here are some practical examples:

- eliminate use of lead-based paints
- avoid the need for heavy lifting by using mechanical hoists or redesigning the task
- substitute a hazardous substance with a less hazardous one
- replace a very noisy piece of equipment with a quieter one
- enclose and automate a hazardous process
- improve sound or heat insulation
- minimize the amount or type of hazardous substances used
- minimize exposures and exposure levels
- provide personal protective equipment

These measures will improve health and safety for all workers, and avoid future risks. They will also benefit the employer by improving productivity and efficiency.

## Making adjustments

As well as making general improvements, you can make adjustments for the individual worker. Quite often the risks can be avoided by making simple changes or temporary adjustments in the work or working conditions, as shown in the following examples:

- *Risks of heat exposure* can be avoided by adjusting working temperatures where possible, improving ventilation, providing plentiful supplies of clean drinking water, and/or providing temporary physical shelter – even in outdoor work, working hours can also be adjusted to avoid working at the hottest part of the day.
- *The need for heavy lifting* can be avoided altogether or reduced if the task is redesigned (for example, by finding other ways of transporting the load, such as using on a trolley or a cart) or the load is redesigned (e.g. made smaller, lighter) or tasks are reallocated.
- *Working heights and work equipment* can be adjusted to avoid postural problems. This may mean providing seating or changing the height of a workstation. Alternatively, provide extra working space and avoid work in confined spaces or at heights, or temporarily relocate the worker to another work area.

**Table 15. Example of precautions to reduce risks for new and expectant mothers in catering**

Risk	Precautions
During manual handling, increased risk of postural problems when pregnant or limitations of ability when the woman has had a Caesarean section	Ensure the woman has light duties not requiring excessive physical exertion
Risk of heat stress, dehydration or fatigue from extremes of hot or cold	Ensure access to refreshments and regular short breaks
Fatigue from prolonged standing or workload involving much physical effort can lead to problems with the development of the baby	Ensure they can take short breaks. Ensure seating is available where possible
Raised blood pressure associated with stress	Discuss and agree to the volume of work and the pace of work
Morning sickness arising from early shift work	Flexible rostering
Morning sickness associated with nauseating smells	Flexible work allocation
Poor balance in later stages of pregnancy increases the risks from slippery surfaces	Clean spillages immediately and ensure sensible footwear is worn

Source. UK Health and Safety Executive, 2001.

### Temporary job transfer

If risks remain, it may be necessary to transfer the worker temporarily to other work or to another work area. Remember to assess the alternatives first!

Further adaptations may be needed to enable nursing mothers to continue breastfeeding on their return to work. The same principles apply: remember to assess and avoid any risks of harm to her or her baby.

#### Case study 1: New dangers

Pregnant plantation workers were transferred from their normal work with crops to alternative duties. The aim was to avoid strenuous manual handling. But the alternative work chosen for them – hand washing protective clothing contaminated with pesticides – was also hazardous for pregnant women. The intentions were good, but the alternatives had not been assessed for reproductive hazards. They were still at risk, because harmful toxins in pesticides can be absorbed through the skin. Different solutions were needed that avoided them being exposed to hazardous substances.

#### Case study 2: Healthy alternatives

When women workers in one of Europe's largest municipal laundries (the Vienna City Laundry in Austria) become pregnant, they are transferred to less arduous sedentary work in the sewing room. Even though the laundry has been extensively mechanized and automated, the work in the central area remains arduous: it involves working in extremes of heat, with risks from hazardous chemicals, soiled linen, blood-borne viruses, awkward postures, manual handling and long hours of standing in fixed positions. But linen, uniforms and protective clothing from all the major hospitals in the area have to be labelled and mended, as well as washed and pressed.

Relocating pregnant workers to work in the sewing room in another part of the building avoids the risks of fatigue, heat stress and injury for the expectant mother, as well as avoiding risks to the unborn child. It also avoids infection risks as they handle only clean laundry in the sewing room.

## Success stories

### *Adapting work or working conditions*

- A pregnant shop worker is given varied tasks in late pregnancy as she finds it hard to sit or stand for too long at one time. Heavy manual handling and handling sale goods on high shelves is also avoided.
- A pregnant woman has severe backache made worse by her job, which involves standing all day at an assembly bench. By adjusting the height of her workbench and providing suitable seating to support her lower back, and rotating her tasks, the need for prolonged standing or sitting at work and awkward postures is avoided.
- A domestic worker is experiencing problems carrying washing and cleaning equipment up and down stairs in the second half of her pregnancy. Her employer arranges for her to start work at the top of the house and work down, to avoid going up and down stairs, and for someone else to carry the cleaning equipment from one floor to another. She suggests using a small trolley to carry the washing from one place to another, reduces the workload, and encourages the worker to sit and rest for a short time if she gets tired or out of breath.
- Uniforms for service workers are specially adapted for pregnant and nursing staff to allow for their changing body shape and size without being too tight or too loose for safety, movement and comfort.

### *Relocating the worker*

- A farm worker who is pregnant during the lambing season is reallocated to an area where she does not have to come in contact with pregnant ewes at lambing time, to avoid risks of infection.
- A heavily pregnant worker who is finding it increasingly hard to climb the steep stairs to her second floor workroom is temporarily relocated in another workroom on the ground floor.
- A pregnant worker's midwife tells her that she should stop working night shifts because she is suffering from fatigue. She is transferred to day work until well after her return from maternity leave.

### **POINTS TO REMEMBER: Taking action to avoid the risks**

- ▶ The woman should not be obliged to do work that might cause her or her child harm, and should not be obliged to do night work if it is contrary to medical advice.
- ▶ Be flexible and take advice as there may be more than one option available. Any alternatives should also be assessed to avoid new health risks.
- ▶ Exclusion from the workplace is a last resort, only after all other measures have been considered.
- ▶ The woman's job and pay should be protected.

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## 7. Promoting healthy maternity

This section

- looks at what else employers and others can do
  - provides guidance on developing workplace maternity policies
  - gives some practical examples of successful joint actions and alliances
- 

### Types of action

In Chapter 6, the focus was on preventing harm and the key responsibility of the manager for ensuring the workplace is safe for pregnant and nursing women. This chapter looks more generally at how various actors, including employers, can contribute to creating the positive conditions in workplaces which will help women workers when they are pregnant or breastfeeding.

Apart from specific risk assessments and prevention of harm, there are many other positive ways of preventing harm and improving health and maternity protection at work. They include:

- improving maternity rights and benefits for all women workers;
- promoting a healthy workplace culture and working together with others to identify and solve problems in the workplace;
- providing information, education and advice on reproductive health to women workers, their families and communities and raising awareness about reproductive health and maternity rights;
- campaigning for improvements and resources to improve access to health-care services and maternity benefits;
- improving the range and quality of workplace health facilities, including preventive health education and maternity care (with voluntary confidential health checks and counselling);
- supporting community-based health education initiatives that promote preventive health care, confidential health screening and breastfeeding;
- encouraging national and international cooperation in improving research and research methods relating to reproductive hazards;
- promoting national and international interventions designed to strengthen controls on the production, distribution and use of hazardous substances, and to disseminate related information.

Improving maternity protection provides opportunities to build broad alliances at all levels of society. Indeed, partnerships are essential for ensuring the coordination and synergy of actions of the various groups involved, and thus a better chance of impact. This chapter looks at how various groups can contribute to healthy maternity for workers.

Alliances have been formed at local, national and international level. They have involved a wide range of interest groups, including:

- employers and the business community
- trade unions and labour movement organizations
- women's organizations
- occupational safety and health advisors and labour inspectors
- health-care providers and medical professions
- epidemiologists, academic and research institutions
- lawyers and equality advisors
- government and international agencies and other regulators
- scientists and scientific standard-setters
- manufacturers and suppliers, designers and engineers
- environmentalists and educators
- community groups and NGOs

## Action by employers

Employers have the primary responsibility for protecting workers' health and safety in the workplace, but this does not mean that they have to tackle these issues alone, as will be seen below. Nevertheless they are in a position of power and leadership which makes their support particularly critical. Some ideas on what employers can do are given below. Developing a maternity protection policy is a particularly important action.

Many employers have developed policies for workplace maternity protection, but these do not always include occupational health and safety or reproductive health protection for other workers. But health protection is an important part of maternity protection, and should be included.

A clear policy provides a framework for action to prevent and avoid pregnancy-related discrimination and risks to health. It informs people of their rights and responsibilities. The policy can be a stand-alone document, part of the employer's workplace safety and health policy, or part of its equality or human resource management policy. It can always refer to other policies where necessary.

A workplace maternity policy that conforms with best practice:

- provides a clear statement about non-discrimination and a commitment to workplace health protection;
- ensures consistency with appropriate national laws and national-level agreements;
- lays down a consistent standard for decisions affecting workers' health, work and working conditions;
- establishes maternity protection rights for women workers;
- sets out the employer's arrangements for managing maternity protection and assessing and avoiding risks (and for monitoring and reviewing risk assessments);
- sets out lines of responsibility and reporting lines, and gives guidance to workers and their managers and supervisors;
- outlines arrangements for consultation with workers, their representatives and/or advisors, together with procedures for grievances or appeals;
- sets out arrangements for monitoring health outcomes and reporting adverse effects of workplace exposures, and for health surveillance;
- helps improve women's reproductive health through risk assessment and preventive measures.

Should the policy be agreed with trade unions? There are many advantages to an agreed policy, rather than one simply issued by management.

- An agreed policy demonstrates that both management and union are committed to avoiding risks and discrimination.
- An agreed policy is more likely to be supported and implemented.
- Prior consultation will allow potential problems to be discussed and resolved.
- An agreed policy can clarify how the maternity protection policy fits in with other joint agreements that regulate workplace arrangements and working conditions.

Some policies limit the number of workers entitled to health benefits or restrict maternity benefits to a few. Others limit health protection by restricting it to particular occupations or risks. However, general protection is best.

- *If a policy is fully inclusive, more people will be protected.* It is important to ensure that risks to all pregnant women, new and nursing mothers are assessed. This includes temporary and agency staff and migrant workers if they are also exposed to risks at work. Restricting the workers covered by assessments, or limiting who will be provided with information about risks, may leave others unprotected.
- *Reproductive damage can occur at any age.* Avoid arbitrary age limits for people at risk.
- Some reproductive hazards are not just risks to workers during maternity but also hazards to workers generally, although pregnant and nursing workers and the child may be affected in specific ways. For example, nearly all known mutagens can also cause cancer. If protection is limited to pregnancy, workers will still be at risk at other times. This can mean not only that women may be at risk in the future, but also that all workers – men and women – may be at risk at other times. General protection is needed.
- The principle of “safe and healthy workplaces for all” will generally provide the best protection for both the present and the future, as long as the policy aims to take account of individual circumstances and any relevant new guidance or research evidence.

### **What can employers do?**

- Consult workers and their trade unions, wherever possible, when developing maternity protection policies.
- Be supportive to expectant, new and nursing mothers at work.
- Support attendance at pre-natal and post-natal care.
- Introduce measures to permit mothers to continue breastfeeding safely.
- Provide workers and their managers with adequate information and training about any potential hazards and the precautions to be taken.
- Check to see that precautionary measures have been implemented correctly and that they are working properly.
- Avoid discriminatory practices, such as harassment or dismissal for pregnancy-related reasons – protect earnings, jobs and job opportunities.
- Create partnerships with support services outside the enterprise.
- Monitor any relevant developments or trends affecting reproductive health.
- Support health promotion and health education activities in the workplace, including peer education, with women's active involvement and participation.
- Support specific health initiatives, such as HIV/AIDS prevention and care programmes, smoking cessation or breastfeeding promotion programmes.
- Promote best practice in the workplace within the wider business community.

Take the following steps when developing, implementing and reviewing the policy.

- Consult widely and include women to take account of their views.
- Make sure women are represented on any joint committee overseeing the policy and its implementation.
- Ensure that standards used for occupational exposure limits are gender-sensitive and are adjusted to take into account the susceptibilities of expectant, new and nursing mothers and the child.
- Wherever practicable, seek to apply measures that provide protection for all workers to avoid future risks: avoid arbitrary or unjustifiable exclusions.
- Take account of the need to review and revise the policy in the light of new evidence of significant risks or advice from competent authorities about the effects of workplace exposures and reproductive health.
- Try to make sure that everyone at work knows and understands the policy.

## Action by trade unions

Trade unions have a vital role to play in raising awareness and improving maternity protection in the workplace and beyond. They are ideally placed to gather information from their members about their health concerns, experiences and any ill-effects. They can and do share this information (and the findings of any investigations) with the workforce, the wider labour movement and the relevant authorities, as well as with employers and employers' associations.

Trained trade union safety representatives play a pivotal role in organized workplaces, providing health and safety information, representation and advice to workers, educating their members, improving health and safety standards and workplace communication, and pressing for improvements in national law and practice.

Around the world, trade unions have published union guidance and model policies on maternity protection. They have supported women's organizations and worked with NGOs and others (including regulatory bodies, employers' associations and governments) to make the concerns and experiences of their members known. They have gathered information about particular hazards, such as pesticides, and have supported legal action in the courts to press for compensation for workers who have been harmed by reproductive hazards at work.

Trade unions have also pressed for gender-sensitive standards in the regulation of hazardous substances, and for stricter controls on the use of hazardous substances at work and in the community.

### Maternity protection: Unions in action worldwide

On International Workers' Memorial Day in April 1999, the International Confederation of Free Trade Unions (ICFTU) held a worldwide Day of Mourning, with high profile activities dedicated to women workers who had died or been harmed as a result of neglect of their health and safety at work. Campaign activities in every region highlighted the devastating effects on reproductive health of exposure to radiation hazards, pesticides and other chemicals, lead poisoning, poor working conditions and dangerous work activities. They called for better workplace organization, better prevention, and stronger enforcement of health and safety legislation.

In 2001, the ICFTU, Public Services International (PSI) and Education International (EI) produced a Maternity Protection Campaign Kit, following the adoption of Convention No. 183, with support from the ILO.

Source: ICFTU



They can:

- educate their members and train union representatives on maternity protection at work;
- consult and represent women workers, and pregnant workers in particular;
- negotiate collective agreements on maternity pay and leave;
- develop and review maternity policies at work and in the union;
- make sure that women's health and maternity rights are taken seriously in the workplace and in the union;
- develop gender-sensitive approaches to occupational safety and health;
- contribute to research efforts and make women's experiences at work visible;
- campaign for improvements in national and international law and practice.

Workers and unions should work together with employers wherever they can to eliminate hazardous exposures altogether if possible, or (if this is not feasible) to reduce them to levels permitted in national or internal standards (using standards that apply to maternity protection). Improving general protection, avoiding discrimination, and mainstreaming gender and health will benefit the whole workforce.

### **What trade unions can do?**

#### **In the workplace**

- Talk to workers (both men and women) about any reproductive health problems.
- Raise awareness at all levels about reproductive hazards and how to avoid the risks.
- Raise worker's concerns with the employer (if the worker agrees).
- Carry out workplace inspections and find out what the problems are.
- Report possible reproductive hazards to the employer and seek investigations into possible causes.
- Conduct confidential surveys of workers and investigate reproductive health problems.
- Press the employer to eliminate all significant risks from the workplace, if possible.
- Negotiate maternity protection agreements covering all workers in all jobs.
- Work together with employers to develop joint maternity policies.

#### **In the union**

- Raise the issues at union meetings.
- Include maternity rights and health protection in union education courses.
- Provide workers and their families with information and advice on women's health and reproductive health at work.
- Support women members at work, and take their concerns and working lives seriously.
- Carry out gender-sensitive research across different workplaces.
- Publicize research findings and success stories.
- Encourage women to be trained as safety representatives.

#### **At industry or national level**

- Develop policies, work with others to improve maternity protection at industry level.
- Campaign for improvements – press for maternity protection measures and policies that promote equality at work and avoid unfair discrimination for pregnancy-related reasons.
- Press for more and better research into reproductive health hazards.
- Press for better laws to protect women from health risks and discrimination.
- Promote best practice in maternity protection.



## Action by health-care professionals

Medical and health-care professions have a major role to play in workplace maternity protection, particularly when they are in the workplace.

- They are an important source of information and health advice for employers, unions, workers and their families, and communities.
- Medical staff and other health-care providers may be required to provide employers with medical certificates.
- They can provide much-needed health surveillance, confidential advice, pre-natal screening and post-natal care.
- They are well-placed to promote healthy breastfeeding, provide lactation advice and prevent mother-to-child transmission of HIV.

### Examples of workplace health promotion initiatives

#### Workplace health initiatives

- Reproductive health education and health promotion programmes
- Discussion groups and talks on reproductive health in working time
- Confidential health advice for working mothers and their children
- Occupational health facilities and workplace health surveillance
- Confidential workplace-based health screening, voluntary testing, support and advice
- Workplace information and advice for breastfeeding mothers
- Referral arrangements for employee assistance and support where needed
- Appropriate workplace voluntary immunization programmes
- HIV/AIDS prevention, condom distribution, voluntary confidential testing, treatment and care (including prevention of mother-to-child transmission and use of antiretrovirals)
- Paid time-off for attending appointments, discussion groups or clinics
- Multidisciplinary health action groups (involving unions, managers and occupational health experts) responsible for developing preventive health-education programmes and services
- Peer education in the workplace, with community outreach activities

#### Community-based health facilities

- Medical care programmes or micro-insurance schemes, including ante-natal, maternity and post-natal care and lactation advice
- HIV/AIDS prevention, condom distribution, voluntary confidential testing, treatment and care (including prevention of mother-to-child transmission and use of antiretrovirals)
- Micro health insurance schemes covering local communities or workplaces
- Family health-care provision during pregnancy, childbirth and breastfeeding

#### Welfare facilities for workers at or near the workplace

- Subsidized workplace canteens with healthy food
- Smoking cessation programmes
- Child-care facilities
- Leisure facilities for workers and their families

They can also play a key role as sources of authoritative advice and information on reproductive health and maternity protection. The Maternity Protection Convention, 2000 (No. 183), and Recommendation No. 191 state that employers should take account of medical certificates and advice from competent authorities. Governments seek expert opinions from the occupational health and safety, medical and scientific communities about reproductive hazards and workplace maternity protection.

In addition, there is an urgent need for more and better research into the effects of workplace exposures on workers' reproductive health. Many experts believe that better research methods are also needed, because the problems are complex and workplaces vary so much. Data collection also needs to be improved.

The occupational safety and health and medical professions can work with scientists, researchers and governments to address these problems and help to break the silence that often surrounds reproductive health and women's health at work.

### What can be done to improve research?

- Raise the profile of workplace maternity protection and reproductive health hazards at work and within the scientific community.
- Give more attention to occupational health and women's health at work in vocational training.
- Improve data collection on reproductive health and pregnancy outcomes.
- Monitor adverse pregnancy outcomes in the workplace.
- Monitor the health impact of past and present workplace exposures (on men and women).
- Keep up-to-date and provide important information to interested parties (including workers and their representatives) about any possible hazards or risks from work.
- Work with others to improve research and develop improved research methods.
- Press for funding for more and better research into the effects of work exposures or working conditions on reproductive health.

## Action by governments

Governments have a key role as competent authorities in improving maternity protection, both in the workplace and in general, and in promoting equality and public health.

Many governments have introduced important measures to improve maternity protection. But some of these measures only exist on paper, either due to lack of enforcement or lack of public information and education. More support is needed for relevant research and practical measures aimed at protecting reproductive health at work.

By extending maternity protection, promoting more and better research, improving data collection, and ensuring that employers and others can access appropriate advice and guidance from competent authorities, governments can make a major contribution to the future.

Many national governments have developed a range of different measures to provide for maternity health protection at work. These have often been developed following extensive consultations between the social partners and with relevant authorities and advisors. As regulators, governments can help to promote best practice as well as minimum national and international standards.

Governments can:

- ratify Convention No. 183 and improve maternity protection laws;
- support tripartite initiatives with employers and trade unions on maternity protection;
- ensure that labour inspectors receive training about reproductive health and women's health at work;
- require labour inspectors to investigate reproductive hazards in the workplaces they visit;
- make more resources available for workplace maternity protection and related research;
- provide authoritative guidance and competent advice to employers and others about avoiding risks to reproductive health at work;
- promote healthy breastfeeding and help prevent mother-to-child transmission of HIV;
- improve public health facilities and access to affordable maternal and child health services;
- raise public awareness and publicize the issues widely.

Ensuring that quality reproductive health services are available and accessible to all at the time of need, with community clinics and midwives, is a key challenge for governments. The WHO has called for increased training and support for skilled birth attendants as an urgent necessity [WHO, 2003b].

## Action by women workers

Women workers need to understand better the reproductive process and the risks they may be facing at work, particularly during pregnancy and breastfeeding. This is an essential condition for them being able to take action on their own behalf and participate knowledgeably in workplace dialogue. Involving women in decisions affecting their work and health is one way forward. Involving and supporting them through collective action is another. The first step is to make sure women know their rights and can take action on their own behalf without fear of losing their jobs.

The confidential checklist for use by the individual woman, provided in Annex 3, can be used by pregnant or nursing women to assess particular problems with their pregnancy in relation to the workplace. It could also be used by groups of women to help identify common or collective issues.

### Case study: Making women's voices heard

In the United Kingdom, a woman MP and former Cabinet Minister worked together with women and men in the Knitwear, Footwear and Allied Trades (KFAT) trade union to compile a report recording the views and experiences of pregnant women and working mothers with babies in six textile and shoe factories.

The report formed part of the preparation of the union's evidence to the government's formal review of maternity pay and leave and parental leave legislation. The companies involved also cooperated by letting them use their meeting room or boardroom for interviews and allowed the women to be interviewed without loss of pay.

Source: Harman, 2000

### **Are you at risk? Some points for women workers to remember**

- You should not be put at risk by your work or working conditions, and you should not have to work at night if you are advised not to for health reasons. Your job should be protected too.
- Ask for a medical certificate to give to the employer if you are told that your work or working conditions (e.g. night work) could be a risk to your own health or that of your baby.
- Because most hazards and work situations have not been adequately studied for their effects on reproductive health, it is hard to know for certain what all the risks may be.
- Your employer should provide you with clear information about any risks in the workplace, and any necessary precautions or adjustments for maternity. You should be consulted and informed.
- Work as safely as you can, follow safety instructions and use protective equipment provided for your protection (tell your employer if it doesn't fit you during pregnancy). Find out what you can about any chemicals that you are handling or breathing in at work.
- If you are a union member, ask your union representative for advice if you have any problems or concerns about your work or maternity rights.
- Follow general advice for a healthier pregnancy, such as avoiding smoking and drinking alcohol. Health checks are important during and after pregnancy for you and your baby.
- Seek medical attention without delay from your doctor, midwife or other trained health worker if you experience any unusual symptoms or feel something is wrong.

## **What can non-governmental organizations (NGOs) do?**

The role of NGOs in maternity protection is very wide-ranging, as it is not confined to a particular workplace, profession, product or interest group, nor is it confined to women's NGOs. NGOs often lack resources but they can have a powerful voice in bringing about changes in attitudes and behaviour at all levels of society. Many NGOs have been very active in supporting and mainstreaming gender equality and women's health rights, including reproductive health and environmental issues.

Amongst many other things, NGOs can:

- support women and their families;
- promote maternal and child health and press for improved provision;
- forge links between workplaces and the community;
- campaign for environmental protection;
- press for the substitution of known reproductive hazards used in the workplace by less harmful substances;
- press for better regulatory controls on hazardous substances, especially those that are harmful to the environment such as pesticides;
- support and conduct more research into harmful effects of workplace and environmental exposures, and help to gather data and other evidence about those effects on workers, their families and the community at large.

An example of NGO action in the United Kingdom is given below. International alliances are also promoting women's occupational health and maternity protection, as seen in the example of the Clean Clothes Campaign. Regional and global alliances, supported by international agencies and others, are helping people around the world to work together to strengthen and improve maternity protection.

The internet is making information more readily available and helping people to build networks throughout the world. Readers who wish to keep abreast of activities in this field or contact others can visit the various websites indicated in Annex 9.

### Case study: NGO action in the United Kingdom

**Maternity Alliance** is a voluntary, non-profit organization that brings many different interest groups together under one national "umbrella" to work for improvements in maternity protection inside and outside the workplace. The Alliance is broadly based and ensures a high profile for maternity issues. As an authoritative voice, it has the ear of government and the message gets through. The Alliance has successfully campaigned for improvements in law and practice. It also:

- offers a wide range of user-friendly advice and information to women and other interest groups, including a telephone help line and enquiry service;
- involves key stakeholders (women, unions, companies, key professions) in all areas of policy development;
- lobbies government for improvements in maternity protection rights and related services;
- provides training for employers, unions and others on workplace maternity protection;
- conducts research into relevant issues and monitors current developments in law and practice;
- distributes leaflets and fact sheets on health, employment and social security rights for pregnant workers;
- provides support and advice to mothers on breastfeeding, disability and health issues;
- raises public awareness through the media, health service and public education.

### Case study: International action

In the clothing trade, the **Clean Clothes Campaign** is researching working conditions and compliance with voluntary Codes of Conduct. In factories around the world supplying major retail brands, they are cooperating with customers' own auditors and highlighting labour conditions, including issues affecting pregnant workers' health and safety.

Using researchers to investigate conditions and produce reports, they have worked together with manufacturers, their customers and trade unions to develop the Codes of Conduct and press for improvements where possible.

Their research project in Southern Africa is an example of successful international cooperation. The project was carried out from 2000-2002 by the Centre for Research on Multinational Corporations in the Netherlands, the Trade Union Research Project in South Africa and the International Textile, Garments and Leather Workers' Federation. Regional workshops were organized by SID Denmark, and the report was jointly funded by the Dutch Trade Union Federation (FNV) and by the European Commission.

Source: Clean Clothes Campaign, 2002.

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# Annexes

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## Annex 1: Checklists for identifying workplace risks

This annex provides seven checklists to help identify workplace risks:

- (a) **infection risks**
- (b) **chemical risks**
- (c) **physical risks**
- (d) **physical and mental demands**
- (e) **working conditions**
- (f) **workplace safety and hygiene**

The checklists can be used by individuals and groups to identify and select the problem areas that are relevant to their own workplace. The selected issues then become the user's own checklist, tailored to the local situation.

The checklists focus on **what** the hazards are, **who** is being exposed to reproductive health risks, **what work** they are doing, and **when** and **where** they are being exposed to risks at work. They can be used in conjunction with a **walk-through survey** and **direct observation** of the workplace(s), workers and work activities taking place.

This should be followed up by **group discussions** with workers (and representatives or advisors) using the list of hazards and possible precautionary measures in **Annex 2**. Discussion should concentrate on identifying problems and priorities and avoiding significant risks.

Information gained from using these checklists should be used to help identify where risk assessments are needed in the workplace. Their use should be followed up by a **full risk assessment**, for which a sample form is provided in Annex 5. Remember that a checklist is not the same as a risk assessment, which includes an evaluation of risks and control measures as well as hazards and people at risk.

**Workplace risks checklist: Infection risks**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Does the work involve contact with human blood, faeces or body fluids, or with any soiled objects, surfaces or materials?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve close contact with young children or sick people?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve handling infectious material, such as laboratory specimens or contaminated equipment?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any risks of needlestick injuries or cuts from work equipment or discarded objects and hazardous waste?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is any part of the workplace or workers' living quarters affected by infestation (e.g. by insects or vermin)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any infection risks from flooding, contaminated land, soil or unsafe or stagnant water in the work or living areas?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve contact with animals, birds or other wildlife (dead or alive), animal corpses, faeces or bird droppings?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is there any build-up of rotting food or foodstuffs, refuse or decaying matter at the workplace?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve handling hazardous foods or foodstuffs (e.g. unpasteurized dairy products, raw fish or meat) or animal feed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is there a safe water supply for drinking, washing and cleaning?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	

**Workplace risks checklist: Chemicals**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Are workers exposed to hazardous chemicals in any part of the work process (including mixing, treatment, painting, coating, spraying, manufacturing, washing or finishing)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are workers exposed to any hazardous gases, liquids, smoke, vapours or fumes, inhalable dusts, powders, mineral fibres, hazardous metals or other harmful substances?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any of the chemicals used in the work known or suspected to cause reproductive harm or cancer?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is there any indoor air pollution from other sources (e.g. diesel fumes, carbon monoxide or tobacco smoke)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve handling, washing or cleaning contaminated work equipment or clothing at work or at home?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any problems with ventilation in any work areas or kitchens?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are hazardous chemicals allowed to spread out of control (e.g. in floods) pollute drinking water or industrial water supplies or spread to workers' living quarters?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers who are exposed to hazardous substances working without adequate protective clothing or equipment?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any pregnant or breastfeeding workers unable to use protective clothing or equipment correctly because it does not fit them properly?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are workers who handle or dispose of materials, equipment or clothing aware of the risks and what precautions they must take?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	

**Workplace risks checklist: Physical agents**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Are any workers exposed to ionizing radiation from equipment or radioactive materials or irradiated objects, soil, dust, people or substances?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers exposed to hazardous electromagnetic fields or microwaves?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers directly or indirectly exposed to vibration, shocks or jolts to the body, or any other excessive movements?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers exposed to any risks of falling objects, collisions, falls or other sudden impacts?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers exposed to harmful noise in their work environment ?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any workers exposed to extremes of heat or cold (indoors or out), or doing "wet work" or "hot work" or working in refrigerated areas, cold stores or near ovens, steam or flames?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve working outdoors or being exposed to extreme weather conditions without adequate protection?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is suitable protective clothing/equipment provided and does it fit?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are heating, ventilation, air conditioning or other temperature controls adequate and is the working temperature comfortable at all times?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is any of the work undertaken in pressurized atmospheres (e.g. working at extreme heights or at depths underground or underwater)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	

**Workplace risks checklist: Physical and mental demands**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Does the work involve arduous or intensive physical or mental demands?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does it involve carrying, supporting, lifting, pushing or pulling materials, people, animals, products, water, crops, equipment or other loads?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any tasks made more awkward or hazardous by changes in a pregnant woman's shape and size, or by awkward movements and postures?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve standing, sitting or squatting for long periods, sitting in cramped or awkward positions, or seating without backrests or support?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Is adjustable seating (with backrests) provided, and can seating, work surfaces, benches or workstations be adjusted?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve working at heights, climbing steep steps, ladders or stairs, or working in confined spaces?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any risks of violence, bullying, harassment or other abuse (e.g. by security guards or customers) at work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve dealing directly with the public or dealing with difficult, distressed or disturbed people?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve meeting unrealistic production targets or deadlines, handling emergencies, or conflicting demands or priorities?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the workload or work process prevent workers taking necessary breaks to fetch drinking water or go to the toilet when needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	

**Workplace risks checklist: Working conditions**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Does the work involve evening shifts, working at night or into the night, or starting work very early in the morning?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve rotating shifts or split shifts?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are workers required to work long hours or double shifts?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are they compelled to do overtime either at the end of a shift or on rest days, or to be available for on-call duties during their time off?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Do workers have to travel significant distances (on foot or by transport) in the course of their work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve unpredictable working hours?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the work involve lone working, homeworking or working at remote locations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any restrictions on workers seeking first aid or medical attention when needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are any pregnant or breastfeeding workers prevented (by inflexible rules, fines or penalties) from taking rest breaks, refreshment or toilet breaks when needed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Does the way work is organized or carried out mean that the individual worker cannot control the flow of work or adjust the pace?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	

**Workplace risks checklist: Workplace and hygiene issues**

Hazard/issue	Action to be taken	Details of any problems and action to be taken
Are there any problems with facilities for first aid, fire precautions or medical care?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are enough toilets, washing and changing facilities provided and are there separate changing facilities for women and men?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there enough separate toilets for women workers, and are they easily accessible for pregnant women and new and nursing mothers?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are the toilets regularly cleaned and disinfected?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any obstacles blocking fire exits, staircases or walkways that could cause problems for heavily pregnant women?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are clean smoke-free areas provided where workers can rest, eat meals and drink water after washing their hands?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Can work clothing be safely stored and washed separately from personal clothing at work?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
If the employer provides them, are living accommodation or dormitories suitable and safe for pregnant or nursing women?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are entrances and exits clear of obstruction and turnstiles, and can heavily pregnant women use them?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are pregnant workers subjected to harassment or strip searches by security guards?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	
Are there any breastfeeding facilities for workers at or near the workplace? If so, are they private, quiet and hygienic with clean water?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Priority	



## Annex 2: Examples of hazards and possible maternity protection measures

Hazard	Examples of possible measures
Infections from human sources	<p><b>In general</b></p> <ul style="list-style-type: none"> <li>• Follow universal precautions</li> <li>• Use gloves when handling infectious materials including dirty syringes, soiled linen, nappies or towels and when handling debris</li> <li>• Clean and disinfect after spillages to prevent cross infection</li> <li>• Provide facilities for handwashing and changing after handling infectious materials or using toilets, and before eating or breastfeeding</li> </ul> <p><b>In health-care and child-care establishments and laboratories</b></p> <ul style="list-style-type: none"> <li>• Follow clinical hygiene procedures and waste disposal safety procedures strictly</li> </ul> <p><b>In laundries</b></p> <ul style="list-style-type: none"> <li>• Alert staff and laundry sources to risks of soiled materials and contaminated objects mixed in with dirty laundry, use gloves when sorting unclean items</li> </ul> <p><b>In laboratories and mortuaries</b></p> <ul style="list-style-type: none"> <li>• Provide protective clothing, effective ventilation, and correctly fitted and well maintained extractor hoods as appropriate for hazardous tests involving possible airborne infection, follow health and safety procedures strictly</li> </ul>
Infections from animals, birds, insects, other wildlife, vermin, contaminated soil or water etc.	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Contact with infected ewes during lambing (relocate or reallocate duties)</li> <li>• Contact with infected animal faeces, bird droppings or unpasteurized milk products (relocate)</li> </ul> <p><b>Prevent</b></p> <ul style="list-style-type: none"> <li>• Accumulations of rubbish or rotting foodstuffs</li> <li>• Infestation</li> </ul> <p><b>Provide</b></p> <ul style="list-style-type: none"> <li>• Hygienic washing facilities and sanitation for all workers, including outdoor workers</li> <li>• ‘Clean’ areas for refreshments close to facilities for handwashing – ensure people do not eat or drink in contaminated areas</li> </ul>

Hazard	Examples of possible measures
Chemicals and heavy metals	<p><b>In general</b></p> <ul style="list-style-type: none"> <li>Eliminate use of chemicals that are known or suspected to be carcinogens, mutagens or teratogens, or that are known or suspected hazards to male or female reproductive systems or to breastfeeding children (substitute with less hazardous substances if possible). Always check the safety data sheet.</li> </ul> <p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>Hazardous exposures that could harm reproductive health, or affect the mother or child in different ways or at different exposure levels from other workers</li> <li>Hazardous indoor or outdoor pollution resulting from work or work processes</li> </ul> <p><b>Ensure</b></p> <ul style="list-style-type: none"> <li>Manufacturers' instructions for safe handling and storage are followed at all times</li> <li>Hazardous substances are stored and transported safely and are clearly labelled with warning notices, and that disposal does not contaminate the water supply, the environment or living quarters</li> <li>Exposures and health effects, including possible reproductive health effects in both women and men, are monitored regularly and consistently for all workers</li> <li>Hazardous substances are contained and controlled (use engineering controls, etc.)</li> <li>Safe arrangements are made for cleaning or washing protective clothing, work areas and work equipment, without putting cleaners or laundry workers at risk</li> </ul> <p><b>Provide</b></p> <ul style="list-style-type: none"> <li>Suitable ventilation and comfortable protective clothing (including footwear)</li> <li>Appropriate washing, changing and decontamination facilities</li> <li>"Clean" areas for refreshments close to facilities for handwashing. Ensure people do not eat or drink in contaminated areas.</li> </ul>
Ionizing radiation	<ul style="list-style-type: none"> <li>Avoid hazardous exposure to ionizing radiation and to radioactive dusts or particles (note that there may be no safe exposure level for the developing foetus). Comply with internationally recognized guidelines/standards.</li> <li>Monitor exposure at all times, including when using portable equipment or in diagnostics or treatments in industry, aviation, veterinary or health care</li> <li>Prevent contamination</li> <li>If necessary, relocate the worker or transfer her to alternative duties until it is safe for her to return</li> </ul>
Non-ionizing radiation	<ul style="list-style-type: none"> <li>Remove hazards if possible from the workplace</li> <li>Avoid prolonged or hazardous exposure to microwaves or hazardous electromagnetic fields</li> <li>If necessary, relocate worker or transfer to alternative duties until it is safe for her to return</li> </ul>
Shocks, jolts and vibration	<ul style="list-style-type: none"> <li>Avoid risks of excessive movements and impacts including jolts from machinery, animals or falling objects by safe walkways, fencing or exclusion zones</li> <li>Avoid prolonged exposure to low level vibration from machinery or transport</li> <li>Use engineering solutions if possible (minimise vibration at source or cushion body from source to absorb vibration and prevent it being transmitted)</li> <li>Temporarily reallocating hazardous tasks or relocating worker, if necessary transferring to other duties</li> </ul>
Noise	<ul style="list-style-type: none"> <li>Avoid exposure to loud/sudden/prolonged noise (foetus cannot use ear protection, noise exposure is through the mother's abdominal wall)</li> <li>Minimize noise levels, isolate noise at source</li> <li>Improve sound insulation</li> <li>Temporarily reallocating tasks to eliminate noise exposure, or relocating the worker if necessary</li> </ul>

Hazard	Examples of possible measures
Extremes of heat or cold	<ul style="list-style-type: none"> <li>• Avoid sudden or prolonged exposure to extremes of heat or cold or sudden temperature changes</li> <li>• Shield/insulate/isolate heat sources and ventilate work areas</li> <li>• If work involves significant changes in temperature, adjust tasks or work pattern. Build up gradually and space out activities (less body heat is produced by intermittent exertion than prolonged exertion).</li> <li>• Avoid risks of heat stress in the womb by reducing risks of heat stress in the woman; the foetus cannot cool itself. Provide appropriate clothing (cool and non-restrictive in hot areas, warm and protective in the cold).</li> <li>• Ensure the woman has ready access to plentiful supplies of safe drinking water</li> <li>• If necessary, temporarily relocate or transfer the worker to other duties</li> </ul>
Hypobarbic or hyperbarbic conditions	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Working in pressurized atmospheres during pregnancy</li> <li>• Underwater diving during pregnancy</li> </ul> <p><b>Consider</b></p> <ul style="list-style-type: none"> <li>• Temporary relocation</li> <li>• Transfer to alternative duties above ground/in non-pressurized atmospheric conditions if practicable</li> <li>• If not practicable, paid suspension on medical grounds until it is safe for her to return to normal duties</li> </ul>
Strenuous work, manual handling and postural problems	<p><b>During pregnancy and breastfeeding, and for up to six months after childbirth, avoid</b></p> <ul style="list-style-type: none"> <li>• prolonged periods of strenuous exertion</li> <li>• heavy physical demands</li> <li>• strenuous or forceful movements or heavy or strenuous load-bearing activities</li> <li>• repetitive movements in restricted or awkward positions</li> <li>• work activities in work or storage areas requiring forceful movements to move heavy doors, gates, drawers, levers, pulleys, tools, trolleys, machinery or other weights</li> </ul> <p><b>In later stages of pregnancy, or after birth while recovering from Caesarean section, avoid</b></p> <ul style="list-style-type: none"> <li>• extensive reaching, bending, stooping, twisting, stretching</li> <li>• tasks requiring extensive mobility or frequent awkward movements</li> </ul> <p><b>Consider</b></p> <ul style="list-style-type: none"> <li>• Redesigning loads, tasks or working heights and storage heights</li> <li>• Providing appropriate lifting equipment and/or assistance where appropriate</li> <li>• Redesigning, varying or reallocating tasks</li> <li>• Transfer to lighter or alternative duties</li> </ul>

Hazard	Examples of possible measures
Prolonged standing or sitting	<p><b>During pregnancy and after childbirth, avoid</b></p> <ul style="list-style-type: none"> <li>• prolonged periods of sitting or standing</li> <li>• working in fixed or very restricted positions</li> </ul> <p><b>Ensure</b></p> <ul style="list-style-type: none"> <li>• Variations in posture</li> <li>• Regular opportunities for rest and gentle exercise and movement away from the workstation</li> </ul> <p><b>Provide</b></p> <ul style="list-style-type: none"> <li>• Comfortable seating with back support in rest area and where possible at workstation</li> <li>• Varied tasks</li> </ul> <p><b>Consider</b></p> <ul style="list-style-type: none"> <li>• Redesigning tasks or workstations, adjusting or adapting working position, tasks and movements</li> <li>• Temporarily rotating tasks or jobs, reallocating duties</li> <li>• Temporary transfer to alternative work if necessary</li> </ul>
Climbing, working at heights	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Working at heights or climbing in later stages of pregnancy or earlier if the woman is experiencing dizziness or breathlessness</li> <li>• Work involving climbing ladders or repeatedly going up and down very steep stairs during pregnancy</li> <li>• Outdoor work involving climbing up steep inclines, hill or mountain sides, especially when carrying loads, crops or water or climbing onto high carts or steep-sided vehicles or other forms of transport</li> </ul> <p><b>Consider</b></p> <ul style="list-style-type: none"> <li>• Temporarily relocating the work activity/worker</li> <li>• Temporary transfer to alternative duties if necessary</li> </ul>
Work stressors	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Exposing workers to workplace stressors, including intimidation, undue pressures, shift work, or excessive working hours or workloads, unrealistic performance targets, arbitrary fines or dismissal</li> <li>• Repetitive or monotonous tasks or inflexible working practices where the pace or volume of work cannot be influenced by the worker, or which make it harder for women to combine work and family life</li> </ul> <p><b>Prevent</b></p> <ul style="list-style-type: none"> <li>• Psycho-social risks, such as risks of violence and harassment, unfair or discriminatory treatment</li> </ul> <p><b>Consider</b></p> <ul style="list-style-type: none"> <li>• Adjustments to working hours, working conditions, work location or work activities</li> <li>• Temporary transfer to alternative location or other duties if necessary/appropriate</li> <li>• Practical support and assistance and reassurance for staff who are experiencing stress or worried about their pregnancy, health, future job security</li> </ul>

Hazard	Examples of possible measures
Working hours and working conditions	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Requiring the woman to work nights or rotating shifts if contrary to medical advice</li> <li>• Excessive working hours or compulsory overtime</li> <li>• Short-notice changes in shifts or overtime requirements</li> <li>• Short breaks between shifts (rotate forwards not backwards, and provide rest when needed)</li> <li>• Restricting how often or when the woman can take rest breaks or toilet breaks</li> <li>• Prolonged periods of work, particularly arduous work, without frequent rest breaks and regular meal and refreshment breaks</li> <li>• Prolonged exposure to other work hazards due to long hours, including strenuous work, ergonomic problems, hazardous substances, vibration, noise or stress</li> <li>• Undue pressure of work due to piecework systems or other requirements</li> <li>• Imposing inflexible performance or production targets, unrealistic deadlines or other constraints</li> <li>• Lone working in later stages of pregnancy or on medical advice</li> </ul> <p><b>Prevent</b></p> <ul style="list-style-type: none"> <li>• Harassment or discriminatory treatment based on pregnancy or pregnancy-related changes in work or working conditions</li> <li>• Risks of violence that may be associated with night work or shift work</li> </ul> <p><b>Provide</b></p> <ul style="list-style-type: none"> <li>• First aid and access to rest and welfare facilities for all workers at all working times</li> <li>• Frequent and flexible opportunities for toilet and rest breaks, with appropriate facilities</li> <li>• Flexible rostering for pregnant and nursing workers</li> <li>• Nursing breaks, or shorter working hours, for nursing mothers</li> <li>• Time off to obtain medical care as advised before and after the birth, or in the event of complications of pregnancy or childbirth, or in the event of pregnancy-related sickness</li> <li>• Adequate maternity leave before and after delivery (including leave following stillbirth or miscarriage)</li> </ul> <p><b>Adjust</b></p> <ul style="list-style-type: none"> <li>• Start times (avoid early starts for women affected by morning sickness)</li> <li>• Shift timing and length of shifts</li> <li>• Overall working hours and overtime</li> <li>• Production and performance targets, according to working time adjustments</li> <li>• Work-related travel requirements for pregnant and nursing workers</li> </ul>

Hazard	Examples of possible measures
Workplace facilities, cleanliness and hygiene	<p><b>Avoid</b></p> <ul style="list-style-type: none"> <li>• Arbitrary restrictions or arbitrary limits on the timing or duration of toilet breaks or how many workers can go to the toilet or seek first aid or medical attention</li> <li>• Inflexible rules that prevent pregnant or nursing workers taking extra breaks or breaks at different times when they need to do this because of their condition</li> <li>• Penalizing or harassing pregnant or nursing workers (or discriminating against them in other ways) for going to the toilet or getting drinking water more often than others, or for seeking medical care and attention when needed</li> </ul> <p><b>Ensure</b></p> <ul style="list-style-type: none"> <li>• That emergency exits are accessible to women with restricted mobility (and are not locked or obstructed)</li> <li>• That work areas and all relevant facilities, including toilets, canteens, rest and refreshment areas, and nursing facilities are clean, suitable, safe and hygienic</li> <li>• That all workers on all shifts have ready access to toilets and first aid or medical facilities without fines or loss of pay, with separate toilets for men and women</li> <li>• That there is ready access to handwashing facilities and potable drinking water in or close by all work areas, and that they can be freely accessed</li> <li>• Hygienic, quiet and private facilities for breastfeeding or for breastmilk expression and storage, with clean water</li> </ul>

### **Annex 3:**

## **A confidential checklist for use by the individual worker**

This checklist can be used by an individual woman and/or her health worker, advisor or representative to help gather information about her work and any symptoms of pregnancy or work-related health risks and effects.

It is designed to gather together information about individual and work factors that may be affecting her during and after her pregnancy or while breastfeeding.

The checklist itself should be treated confidentially as it may contain sensitive personal information. (Ideally, the woman should be encouraged to inform her employer of her situation as soon as possible, but in reality she may be deterred from doing so if she is anxious about her future employment or her pregnancy.) She may wish to share some or all of the information with others, but should not be compelled to do so under duress or against her will. If she volunteers to part with a copy of this checklist, it should be stored in a secure place and should not be shown to anyone else without her express consent.

If the woman is experiencing pregnancy-related problems at work or ill effects, it is vital that she be encouraged to seek medical attention or other relevant advice.

Although this checklist is designed for use in individual cases, the questions can also be tailored for group use to record the experiences and concerns of a group of expectant, new or nursing mothers and to identify collective issues.

This checklist can be used to make a list of things that could be useful for you, your advisor or your employer to know about how your pregnancy is affecting you at work, or how your work may be affecting you during your pregnancy. You may choose to share this information with someone else, or you may just want to keep it confidentially for your own use.

*What is your job?*

Are you:

- pregnant?
- returning to work after pregnancy?
- breastfeeding?
- experiencing any health problems involving complications due to pregnancy or childbirth?

*Are any of these aspects of pregnancy or maternity affecting you at work?*

- morning sickness or nausea
- tiredness, daytime sleepiness or fatigue
- changes in your body shape or size
- difficulty eating or not enough food to eat, indigestion or heartburn
- feeling thirsty or dehydrated
- difficulty sleeping
- backache
- physical discomfort (other aches and pains)
- swollen legs, varicose veins, haemorrhoids (piles) or circulation problems
- problems with blood pressure, fainting or dizzy spells
- difficulty reaching, stretching or bending down or lack of agility
- feeling anxious or tearful or having sudden mood swings
- worries about money or the baby or the future
- breathlessness
- frequency or urgency (needing to pass water more often)
- feeling unusually hot
- difficulty standing or sitting for long periods
- difficulties climbing stairs, walking quickly or walking uphill

*Does your work involve any of the following hazards or activities?*

- working with young children or sick people
- working with or near animals or birds
- infection risks from insect bites or parasites
- insects, vermin or other wildlife
- handling raw fish or meat or preparing or mixing food
- handling refuse or decaying food or animal feed
- vibration, shocks or regular jolts to your body or excessive movements
- working in extreme temperatures (too hot or too cold)
- being exposed to radiation (e.g. X-rays)
- high noise levels
- diving, working underground or working in pressurised atmospheres
- mixing, using, spraying or handling chemicals at work
- indoor or outdoor air pollution or strong smells
- lifting, carrying, pushing or pulling heavy or awkward loads
- other strenuous or arduous physical work



*Are you affected by any of the following problems at work?*

- difficulty using work equipment or protective clothing due to changes in body shape or size
- problems keeping up with work demands, performance targets or the pace of work
- unable to take rest breaks when feeling tired
- not allowed to stop work to go to the toilet when needed
- unable to have regular meals or meal breaks
- not having anywhere comfortable to rest, sit or lie down during breaks
- having to stand up for long periods at work
- having to sit in a fixed or awkward position for long periods
- difficulty doing tasks involving reaching or stretching or bending down
- working in a smoky environment or with fumes from diesel, traffic, chemicals, flame heaters or work equipment
- working at heights or climbing
- having to wash protective clothing or dirty overalls at home or at work
- lack of clean hand-washing facilities or clean drinking water at work
- having to travel long distances on foot or using transport at work
- working long hours
- working at night or into the night or doing alternating shift work
- working overtime or double shifts
- working alone or in remote areas or out of contact with others
- having no-one at hand to help in an emergency
- risks of violence, bullying or harassment
- intensive or excessive workloads
- unsympathetic or unsupportive co-workers or management
- lack of information about work hazards and risks
- poor health and safety or dangerous working practices
- working outdoors or in wet conditions

*Are you experiencing any other problems at work during your pregnancy?  
If so, what are they?*

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If you are seeing a doctor, nurse, midwife or community health worker, it is important to let them know about any problems you are experiencing at work, so that they can give you the right advice. You may need to provide your employer with a medical certificate if you need to ask for temporary changes in your work or working conditions while you are pregnant. **If you are experiencing problems or are worried about your health, do ask someone for advice, Many problems can be prevented with the right help and advice.**

## Annex 4: A sample risk assessment form

This form is designed to help the user work through the different steps involved in risk assessment, and record the findings, including decisions about the action to be taken. It can be used in conjunction with the **checkpoints** and any **information about individual factors** volunteered by the individual woman and/or her health worker, advisor or representative.

Risk assessments should be kept under review as the pregnancy progresses, as pregnancy is a constantly changing condition. Any significant changes in the individual's health (or complications of pregnancy or birth) or proposed changes in the work, work equipment, workforce or workplace should also be assessed for risks to assess their impact on workers' health.

The risk assessment form can be used to assess *generic risks* (risks that apply to a group or class of employees or a type of work activity), or to risks that are specific to an individual worker or a specific situation.

Any information about reproductive health risks that are not specific to the individual concerned (i.e. relating to individual factors) should be shared with the workforce and their representatives. This is important because some risks can affect reproductive health, either before conception or before the worker is aware of their pregnancy.

**Sample risk assessment form for expectant, new or nursing mothers and the child**

What is being assessed?		Name of employee:	
Work location:		Date of assessment:	
Who assessed the risks and who else was consulted?			
<b>Hazard</b> (What could cause harm?)	<b>People at risk</b> (Who might be harmed, when and how?)	<b>Risk period</b>	<b>Individual factors</b> (Are there any individual factors or complications?)
			<b>Action and timing needed to avoid risks</b> (How can the risks be prevented, and when are precautions needed?)

## Annex 5: Examples of infection risks to expectant and nursing mothers in the workplace

Hazard (organism)	Source	Risk to adult re pregnancy	Risk to unborn or breastfed child	Particular risk period	Transmission route(s) to child	Examples of occupations at risk of exposure	Prevention and control
Chlamydia psittaci (various types)	Infected birds, sheep during lambing	Kidney and liver-function problems, abnormal blood clotting (mother and baby)	Spontaneous abortion, death or premature birth (acute infection from sheep)	May be more severe in pregnancy and after third month	Across the placenta (severe cases)	People working in contact with infected animals or birds, e.g. agricultural workers, farmers, veterinary workers, etc.	Avoid contaminated clothing/boots Avoid contact with infected ewes, new-born lambs and placentas at lambing time
Human cytomegalovirus (CMV)	People – especially children (breastmilk, saliva, blood)	May be asymptomatic	Possible damage to central nervous system, deafness, low birth weight, developmental disorders (in some cases only)	When infected, at any time in pregnancy	Across the placenta	Child-care or nursery workers, health-care workers, laundry workers	Special attention to hygiene, handwashing, etc. Extra care in handling nappies and excreta from babies and children
Hepatitis A	People, food or water contaminated by faeces	Jaundice More severe in adults than children		Depends on stage of infection	Via mouth contact with objects contaminated with faeces to baby (unlikely to unborn baby)	Child-care or nursery workers, primary school staff, sewage workers, cleaners, agricultural workers	Special attention to hygiene, handwashing, etc. Vaccination (not for babies under 1 year)
Hepatitis B	People, contaminated needles, blood, body fluids, etc.	Acute liver inflammation, possibly fatal. Also chronic hepatitis, cirrhosis, liver cancer	Low birth weight. If infected, at increased risk of chronic liver disease and liver cancer in later life	Depends on stage of infection (high risk of mother to child trans-mission)	Exposure to maternal blood during or just after childbirth	People exposed to blood and body fluids: health and residential care workers, dentists, laboratory staff, prison staff, cleaners, emergency services	Avoid contaminated sharps, avoid direct contact with body fluids Use protective clothing Immunization

Hazard (organism)	Source	Risk to adult re pregnancy	Risk to unborn or breastfed child	Particular risk period	Transmission route(s) to child	Examples of occupations at risk of exposure	Prevention and control
Hepatitis E	As for Hepatitis A	High death rate for infected pregnant women					No available vaccine
HIV	People, contaminated sharps, blood and body fluids, laboratory specimens, etc.	AIDS and related conditions	If infected, may develop AIDS and other diseases		Across placenta, during delivery and by breastfeeding	As for hepatitis B: people exposed to blood and body fluids and contaminated objects	Training, safe working practices, avoid direct contact with blood and contaminated instruments, (universal precautions), safer needles, safe disposal procedures, etc.
Listeria	Contaminated food, infected animals, silage	Flu-like symptoms	If infected, high risk of serious consequences including septicæmia, meningitis, death, spontaneous abortion, premature birth, damage to organs (e.g. airways, eyes, nervous system)	During severe maternal infection	Across the placenta and during delivery	Laboratory workers, food workers, agricultural and farm workers, abattoir workers	Good hygiene. Safe working practices in laboratories and food production.
Papovirus	People via respiratory secretions	"Fifth disease" Rubella-like symptoms (mild rash), joint problems common in women	Foetal death Spontaneous abortion (in some cases)	Pregnancy loss may occur in second and third trimesters	Across the placenta	Health-care workers, laboratory staff, teachers, child-care workers	Good hygiene. Extra controls when working with infected people with impaired immunity or certain other blood disorders

Hazard (organism)	Source	Risk to adult re pregnancy	Risk to unborn or breastfed child	Particular risk period	Transmission route(s) to child	Examples of occupations at risk of exposure	Prevention and control
Plasmodium falciparum (and other types of malaria)	Mosquito bites	Malaria: pregnancy reduces a woman's immunity to malaria, increasing her susceptibility to malaria infection and increasing the risk of illness, severe anaemia and death	For the unborn child, maternal malaria increases the risk of spontaneous abortion, stillbirth, premature delivery, neonatal death or low birth weight. A leading cause of child mortality	Particularly high risk during pregnancy. In areas of low or unstable malaria transmission, pregnant women have low immunity to malaria and a two- to threefold higher risk of severe malarial illness than non-pregnant women	Can infect the placenta and pass to the foetus	Unprotected workers whose work or living quarters expose them to risks from infected mosquitoes, including outdoor and agricultural workers, factory workers, construction workers, workers whose jobs involve travelling to infected areas	Insecticide-treated nets (ITNs). Intermittent preventive treatment. Effective case management of malarial illness. Where possible, avoid travel to infected areas during pregnancy.
Rubella	Humans by close contact and via respiratory secretions	"German measles" rash	Birth defects (including deafness, cataracts, heart defects, microcephaly, learning disability), low birth weight	Particularly high risk for babies of mothers infected in first three months of pregnancy	Across the placenta	Health-care workers, workers in contact with infants and children (e.g. primary school teachers)	Vaccination before pregnancy (if not already immune)
Toxoplasma	Hand-to-mouth contact with infected cat faeces, contaminated soil, poorly washed garden produce, eating undercooked, infected meat	Varying symptoms, sometimes none, can be serious and occasionally fatal. Can remain dormant and return.	May develop eye damage in later life even if asymptomatic at birth. Symptoms at birth include hydrocephalus, brain damage, inflammation of the eyes.	Risk of harm to infected baby is much higher in early pregnancy, but risk of transmission from infected mother to baby is higher later in pregnancy	Across the placenta	People working in contact with animals, e.g. farm, meat, abattoir and animal-care workers, some cleaners, grounds maintenance staff, park keepers	Good hygiene, handwashing, protective clothing where necessary

Hazard (organism)	Source	Risk to adult re pregnancy	Risk to unborn or breastfed child	Particular risk period	Transmission route(s) to child	Examples of occupations at risk of exposure	Prevention and control
Varicella-zoster (chicken pox) (VZV)	People by direct contact, droplet infection or recently soiled materials	Variable severity, usually more severe for adults and may be more severe in pregnancy. Can return as shingles	Skin scarring Brain damage and learning disability, limb abnormalities (in rare cases) No evidence of risk to baby if mother has shingles during pregnancy	Risk is highest in second trimester and low in first trimester. Newborns at particular risk of severe chicken pox if infected in first four days of life	Across the placenta	People in contact with infants and children: health-care workers, nursery workers, school teachers, laundry workers, cleaners	Vaccination before pregnancy if not already immune. If not immune, avoid contact with known cases of chicken pox in the workplace (transfer the worker or adjust her duties, or offer leave to avoid exposure)

Source: UK Advisory Committee on Dangerous Pathogens, 1997; WHO, 2003d, Roll Back Malaria



## Annex 6: Chemicals in the electronics industry that have toxic effects on reproduction

The following is a list of substances used or occurring in electronics which threaten the ability of both men and women to have a normal sex life and to have normal children.

Chemical name	Teratogen	Reduced fertility or sterility	Miscarriage or foetal death	Birth defects, mutations, foetal damage	Cancer of reproductive organs	Menstrual problems
Acrylonitrile	A				C	
Antimony		A	HA	H	C	H
Arsenic		H s	H	A	H	
Benzene	A	H si		A	C	H
Cadmium		H A si	H	H	H	
Carbon dioxide	HA			H/A		
Carbon disulfide		H A si	H/A	H A		
Carbon monoxide		H si		A		
Carbon tetrachloride		A			C	
Cellosolve chlorinated hydrocarbons (several kinds)				H/A	C	
Chlorobenzene	A	A				?
Chloroform			A			?
Diglycidyl ether		A				?
Dimethyl formamide	A					
Epichlorohydrin		H A s				?
Ethylene diamine tetraacetic acid	A					
Ethylene dibromide		H A s	H/A	H/A	C	
Ethylene dichloride	H		H	H	C	
Ethylene oxide		A		A	C	
Ethylidene chloride	A					
Freon 31 (chlorofluoro-methane)	A					

ANNEX 6: CHEMICALS IN THE ELECTRONICS INDUSTRY THAT HAVE TOXIC EFFECTS ON REPRODUCTION

Chemical name	Teratogen	Reduced fertility or sterility	Miscarriage or foetal death	Birth defects, mutations, foetal damage	Cancer of reproductive organs	Menstrual problems
Lead		H A si	H	H	C	H
Lithium	A					
Manganese		H si			C	
Mercury		H A si	H/A	H/A		
Methyl ethyl ketone				H		
Methyl methacrylate	A					
Methylene chloride				H		
Nickel		A			C	
Nitrous oxides			H/A	H/A		
Perchloroethylene				A	C	
Phosphorus		H s				
Polychlorinated biphenyls		A	H	H	C	
Selenium	A					
Tellurium	A					
Toluene	A			A		H
1,1,1-trichloroethane	A			A		
Trichloroethylene		H si	H	H A	C	
Vinyl chloride	H	H	H	H/A	C	
Xylene	A			A		H
Zinc chloride	A				C	
Radiation		H A	H A	H A	H	
Rotating shifts						H

Source: Asia Monitor Resource Centre, 1985.

H = evidence for humans

A = evidence for animals

H/A = evidence for humans and for animals

s = reported to cause sterility in men

i = associated with male impotence

C = known to cause cancer in other parts of the body

## Annex 7: Examples of agents toxic to the male reproductive system

Chemical hazards	Species effect observed (h = humans, a = animals)	Examples of occupations where hazards may occur
Alcohol	h	Social hazard
Alkylating agents	h, a	Chemical and drug manufacturing
Anesthetic gases; nitrous oxide	a, h	Medical, dental and veterinary workers
Cadmium	h, a	Storage batteries; smelter workers
Carbon disulfide	h, a	Viscose rayon manufacture; soil treaters
Carbon tetrachloride	a	Chemical laboratories; dry cleaners
Diethylstilbesterol (DES)	a, h	DES manufacturers
Chloroprene	h, a	Rubber workers
Ethylene oxide	a, h	Health-care workers (disinfectants), users of epoxy resins
Hair dyes	a	Cosmetic manufacturers, hairdressers and barbers
Lead	h, a	Storage batteries, policemen; smelter workers
Manganese	h	Welders, ore smelters and roasters
Nickel	a	Smelters, welders
Organic mercury compounds	a	Pesticide workers
Tris (flame retardants)	a, h	Clothing and textile work
Pesticides <i>Dibromochloropropane (DBCP)</i> <i>Kepone</i> <i>DDT</i> <i>Carbaryl</i> <i>DDVP</i> <i>Malathion</i>	a, h	Farmworkers; pesticide manufacture; applicators; exterminators
Vinyl chloride	h	Polyvinylchloride manufacture and processing
Physical hazards <i>Elevated carbon dioxide</i> <i>Elevated temperatures</i> <i>Microwaves</i> <i>X-irradiation</i>	a h, a h, a h, a	Brewery workers; chemical manufacture Bakers; glassblowers; foundry and oven workers Radar operators; air crewmen; transmitter operators Health workers; radiation workers

Source: Stellmann, 1983, p. 77.

## Annex 8: Pesticides linked to adverse reproductive effects

Chemical	Potential effects
Alachlor*	reproductive effects
Aldicarb*	reproductive effects
Alphamethrin*	reproductive effects
Inorganic arsenic	birth defects in lab tests
Atrazine*	offspring weight
Bendiocarb*	reproductive effects
Benomyl*	birth defects in lab tests
Carbaryl*	birth defects in lab tests
Chlordane*	reproductive effects
Cyanazine	birth defects foetotoxicity
Cyfluthrin	birth defects in lab tests
Chlorpropham	birth defects in lab tests
Chlorpyrifos*	birth defects in lab tests
Cypermethrin	offspring weight
2,4-D*	birth defects in lab tests
Dalapon	birth defects in lab tests
Deltamethrin*	reproductive effects
Dicamba	offspring weight
Dicofol*	reproductive effects
Dieldrin*	birth defect
Dinocap*	birth defects in lab tests
Dinoseb	birth defects in lab tests
Diquat	birth defects in lab tests
Endosulfan*	reproductive effects
EPTC	birth defects in lab tests
Esfenvalerate*	reproductive effects
Ethofumesate	birth defects in lab tests
Etrimofos*	reproductive effects
EDB	birth defects in lab tests
Fenitrothion*	reproductive effects
Fenvalerate*	offspring effects and developmental delays
Folpet	birth defects in lab tests
Fosamine	birth defects in lab tests

\* = known to be used in Indonesia between 1989-1997.

## Annex 8 (continued)

### Pesticides linked to adverse reproductive effects

Chemical	Potential effects
Imazalil	birth defects in lab tests
Isofenphos*	reproductive effects
Lindane*	female fertility and survival of offspring effects
Malathion	birth defects in lab tests
Mancozeb*	reproductive effects
Maneb*	birth defects in lab tests
Metam-sodium	birth defects in lab tests
Methoxychlor	female fertility and litter size
Methyl bromide	birth defects in lab tests
Methyl parathion	birth defects in lab tests
Molinate	birth defects in lab tests
Oxadiazon	birth defects in lab tests
Oxythioquinox	birth defects in lab tests
Paraquat	foetotoxicity
PCP	birth defects in lab tests
Phorate	birth defects in lab tests
Phosalone*	reproductive effects
Phenylmercuric acetate	birth defects in lab tests
Propargite	birth defects in lab tests
Resmethrin	birth defects in lab tests
Tetramethrin	birth defects in lab tests
Thiophanate methyl	birth defects in lab tests
Thiram	birth defects in lab tests
Triadimefon	birth defects in lab tests
Triforine	birth defects in lab tests
Vinclozolin	birth defects in lab tests
Zineb*	reproductive effects
Ziram	birth defects in lab tests

\* = known to be used in Indonesia between 1989-1997.

Source: Watterson, 1999.

## Annex 9: Useful resources and websites

### ILO resources

*Maternity protection at work: Revision of the Maternity Protection Convention (Revised), 1952 (No. 103), and Recommendation, 1952 (No. 95).* International Labour Conference, 87th Session, 1999. Report V(2), Geneva, 1999. Also available in Chinese, French, German, Russian and Spanish.

*Implementing the ILO Code of Practice on HIV/AIDS and the World of Work: An education and training manual* (Geneva, ILO, 2002).

*Guidelines on occupational safety and health management systems, ILO-OSH 2001* (Geneva, ILO, 2001).

*Ergonomic checkpoints: Practical and easy-to-implement solutions for improving safety, health and working conditions*, Second edition, prepared by the ILO in collaboration with the International Ergonomics Association (Geneva, 1999).

*Safety and health in the use of agrochemicals: A guide* (Geneva, ILO, 1990).

*Safety and health in the non-ferrous metals industry* (Geneva, ILO, 2003).

*Technical and ethical guidelines for workers' health surveillance*, Occupational Safety and Health Series No. 72 (Geneva, ILO, 1999).

B. Alli: *Fundamental principles of occupational health and safety* (Geneva, ILO, 2001).

J.C. Hiba (ed.): *Improving working conditions and productivity in the garment industry: An action manual* (Geneva, ILO, 1998).

M. Keith, J. Brook, P. Kirby and E. Rosskam: *Barefoot research: A workers' manual for organising on work security* (Geneva, ILO, 2002). Available online at [www.ilo.org/public/english/protection/ses/index.htm](http://www.ilo.org/public/english/protection/ses/index.htm).

E. Rosskam: *Male and female reproductive health hazards in the workplace* (Geneva, ILO, 1996).

E. Rosskam: *Health and safety for women and children* (Geneva, ILO, 1996).

E. Rosskam: *Your health and safety at work* (Geneva, ILO, 1999). Available in French and Spanish as well as on CD-ROM in the three languages. English and Spanish versions are available in print and on CD-ROM. The CD-ROM is available free from the Bureau for Workers' Activities. The printed versions are available for sale by the ILO Publications Bureau.

A. Spurgeon: *Working time: Its impact on safety and health* (Seoul, ILO and Korea Occupational Safety and Health Agency, 2003). Available from the Conditions of Work and Employment Programme.

J. Stellman (ed.): *Encyclopaedia of occupational health and safety* (4th edition) (Geneva, ILO, 1998). Available in print or on CD-ROM.

## ILO/CIS resources

### *International Occupational Safety and Health Information Centre (CIS)*

The CIS collects and disseminates information on the prevention of occupational accidents and diseases. It is assisted in its work by more than 120 national institutions around the world (its National and Collaborating Centres) dealing with occupational safety and health in their own countries. For further information, contact the International Occupational Safety and Health Information Centre at Tel: +41.22.799.6740, Fax: +41.22.799.8516 or E-mail: [cis@ilo.org](mailto:cis@ilo.org). CIS products can be searched online via the ILO website [www.ilo.org](http://www.ilo.org). The CIS publishes a bimonthly bulletin in three languages (English, French and Spanish): *Safety and Health at Work/ Sécurité et santé au travail/ Boletín bibliográfico de la prevención*.

### *IPCS Chemical Safety Training Modules*

The Training Modules on Chemical Safety have been compiled in order to introduce safe use of chemicals at places of work, to present classification systems for the labelling and transport of dangerous goods, to allow the reading and use of chemical safety cards, to give a basic overview of toxicology and to disseminate information on selected, widely used, hazardous substances. It contains material usable in handouts, demonstrations and exercises, as well as slides, colour transparencies and diskettes containing text files and databases. Available online from the ILO/CIS website at <http://www.ilo.org/public/english/protection/safework/cis/products/safetytm/index.htm>.

### *International Hazard Datasheets on Occupation*

The ILO/CIS database of International Hazard Datasheets on Occupations is available free online via the ILO website. It provides a multipurpose information resource containing information on the hazards, risks and notions of prevention related to a specific occupation. These datasheets are intended for those professionally concerned with health and safety at work including: occupational physicians and nurses, safety engineers, hygienists, education and information specialists, inspectors, employers' representatives, workers' representatives, safety officers and other competent persons.

## WHO and other resources

### *WHO Department of Reproductive Health and Research (RHR)*

Information on reproductive health and research can be accessed via the WHO Reproductive Health and Research website at [www.who.int/reproductive-health/index.htm](http://www.who.int/reproductive-health/index.htm).

### *The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2000-2002, International Programme for Chemical Safety WHO/PCS/01.5*

UNEP/ILO/WHO Inter-Organisational Programme for the Sound Management of Chemicals (IOMC).

### *International Chemical Safety Cards (ICSC)*

These cards summarize essential information on chemical substances and are developed cooperatively by the IPCS and the Commission of the European Union (EC). They summarize essential health and safety information on chemical substances in a clear way, and are not only intended to be used at the "shop floor" level by workers, but also by other interested parties in factories, agriculture, construction and other places of work. Draft versions of the card containing a summary of health and safety information are prepared by cooperating scientific institutions. These institutions have the task of collecting and validating the relevant information. The cards are then peer-reviewed by a committee consisting of internationally-recognized experts who take into account advice given by manufacturers, workers' representatives and poisons centres. They are published

by the Commission of the European Union, and hard copies can be obtained from the Office for Official Publications of the European Union, 2 rue Mercier, L-2985 Luxembourg. They are available online at [www.inchem.org](http://www.inchem.org).

### *Health and Safety Guides (HSG)*

These guides provide concise information in non-technical language, for decision-makers on risks from exposure to chemicals, with practical advice on medical and administrative issues. The Health and Safety Guide series are published by the World Health Organization and hard copies can be obtained from the Office of Distribution and Sales, World Health Organization, 1211 Geneva 27, Switzerland.

### *Pesticide Data Sheets (PDSs)*

These contain basic information for safe use of pesticides. The Pesticide Data Sheets are prepared by WHO in collaboration with FAO and give basic toxicological information on individual pesticides. Priority for issue of PDSs is given to substances having a wide use in public health programmes and/or in agriculture, or having a high or an unusual toxicity record. The data sheets are prepared by scientific experts and peer reviewed. The comments of industry are provided through the industrial association, GIFAP. The data sheets are revised from time to time as required.

## Useful websites

### *IPCS INCHEM*

**[www.inchem.org](http://www.inchem.org)**

IPCS INCHEM resources are produced through cooperation between the International Programme on Chemical Safety (IPCS) and the Canadian Centre for Occupational Health and Safety (CCOHS). IPCS INCHEM directly responds to one of the Intergovernmental Forum on Chemical Safety (IFCS) priority actions to consolidate current, internationally peer-reviewed chemical safety-related publications and database records from international bodies, for public access. IPCS INCHEM offers quick and easy electronic access to thousands of searchable full-text documents on chemical risks and the sound management of chemicals.

### *NIOSH/CDC*

**[www.cdc.gov/niosh/topics/repro](http://www.cdc.gov/niosh/topics/repro)**

Reproductive Health website of the US Department of Health and Human Services Centers for Disease Control and Prevention (CDC) National Institute for Occupational Safety and Health (NIOSH). Also in Spanish.

### *Asia Monitor Resource Centre (AMRC)*

**[www.amrc.org.hk](http://www.amrc.org.hk)**

The Asia Monitor Resource Centre (AMRC) is an independent, non-government organization (NGO) that focuses on Asian labour concerns. It provides information, training, research and support to NGOs, labour and women's organizations with a wide range of online resources.

### *European Agency for Occupational Safety and Health*

**<http://europe.osha.eu.int/> (European Network)**

**<http://global.osha.eu.int/> (Global Network)**

The European Agency manages the European network with Focal Points in the EU Member States, EFTA countries and candidate countries. The Agency is the European Union organization responsible for occupational safety and health information. Together with its own online information



products and services, the Agency also brings together safety and health information from other European Union sources, including the European Commission, the European Parliament, the Council, the Economic and Social Committee, and the European Social Partners. The Agency has launched a new online safety and health guide on dangerous substances with information available in up to 11 languages plus access to online translation services. International organizations, including the ILO and the WHO, as well as leading OSH organizations in the United States, Canada and Australia have joined the global network, providing access to networks across the world.

*The European Trade Union Technical Bureau for Health and Safety (TUTB)*

The TUTB provides technical support and assistance to the European Trade Union Confederation (ETUC) and the European Industry Federations on matters related to the working environment. Coordinates trade union participation in European standardization work. Follows European policies on the assessment, classification and use of dangerous substances.