

# OCCUPATIONAL HEALTH IN MEXICO

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### COUNTRY PROFILE AND FUTURE TRENDS

Mexico, along with Canada and the United States, is part of North America. With an area of 761,610 square miles, it is the fourteenth largest country in the world. According to the results of the 12th Population and Housing Census, as of February 2000 a total of 97,483,412 people resided in Mexico, making it the 11th most populous country in the world.<sup>1</sup>

For centuries, Mexico relied on the export of raw materials (especially minerals and petroleum) and agricultural commodities, and restricted the importation of finished goods. From the 1950s to the mid-1980s, Mexico depended on an import substitution industrialization model, which closed its borders to most imports to protect the output of nascent national industries, many of which were owned and operated by the federal government. Currently, Mexico has a free-market economy with a mixture of modern and outdated industry and agriculture, increasingly dominated by the private sector.<sup>2</sup> According to the Economic Census of 1999,<sup>3</sup> major industries classified by gross total production are car and truck manufacture, oil refining, and basic petrochemical industries; these are followed by the pharmaceutical and computer manufacture industries. According to the number of facilities, the most important industries are tortilla production shops, followed by ironwork shops, bakeries, carpenter shops, and printing houses. These data indicate that small-sized enterprises with minimal technological development are major employers in Mexico.

According to the National Employment Survey of 2000, the economically active population of Mexico numbers almost 40 million, representing 56% of the population 12 years old and over.<sup>4</sup> Of these, more than 25 million (65.9%) are men, and over 13 million (34.1%) are women.<sup>4</sup> Of the economically active population, 4.2% are employers, 23.5% are self-employed, 56.8% are employees with a salary, 6.3% are paid by the piece, and 9.1% do not receive remuneration. Most people are employed in the manufacturing industries (i.e., food, beverage, and tobacco products production; textiles, clothing, and shoe manufacture; furniture and wooden products manufacture; paper and printing industries; chemical industry; oil and charcoal refining; rubber, plastic, and mineral products manufacture; basic metallic and metal products manufacture; machinery manufacture and assembly), followed by agricultural activities and commerce (Table 1).

### Maquiladora Sector

One important element of the Mexican economy is the maquiladora sector, also known as in-bond or twin plants. This sector was created by a 1965 law that permitted foreign-owned corporations to establish duty-free import and export of components for manufacture or assembly in plants located in a narrow zone in Mexico within 100 kilometers of the U.S.-Mexico border. Later the law permitted the expansion of maquiladoras, whether owned by Mexican corporations or foreign-based multinationals, to the entire country—such that in 2000, over 100 Mexican cities in all 31 states had maquiladora plants.<sup>5</sup> The maquiladoras remain largely owned by foreign multinationals, mostly from the United States, but also from Japan, Korea, and Europe, and the vast majority of the plants are still on or near the border.

In 1965 there were only 50 small maquiladoras, but by 2000 Mexico had 4000 maquiladoras employing 1.3 million workers, most of whom were women.<sup>6</sup> These workers are classified under manufacturing industry in Table 1. While only making up part of the manufacture-for-export sector of the Mexican economy, the maquiladoras have been its cutting edge. Led by the maquiladoras, in the 1990s manufactured

**TABLE 1.** Employed Population By Economic Activity in Mexico, 2000

Economic Activity	Employed Population	
	Number	%
Agricultural activities	7,060,706	18.1
Mining and quarry exploitation	65,858	0.1
Oil extraction and refining	157,581	0.4
Manufacturing industry	7,478,851	19.2
Electricity	188,469	0.5
Construction	2,527,638	6.5
Commerce	6,842,175	17.5
Hotels, restaurants, and similar activities	1,844,380	4.7
Transportation and related services	1,545,780	4.0
Communications	184,773	0.5
Real estate and professional and financial services	1,560,939	4.0
Other services	7,627,550	19.6
Public administration and defense	1,739,368	4.5
Not specified*	159,787	0.4
<b>TOTAL</b>	<b>38,983,855</b>	<b>100.0</b>

\*Includes workers residing in the United States whose economic activity is unknown

Source: National Employment Survey (ENE-2000), Instituto Nacional de Estadística, Geografía e Informática

goods for the first time surpassed petroleum as Mexico's leading export and source of national income. However, beginning in 2000 with the economic recession in the U.S., the 2001 attack on the World Trade Center, which resulted in new controls at the U.S. border, the creation of new taxes on the maquiladoras, and rising competition from Asia, Mexican maquiladoras laid off 213,000 workers, and Mexico's business elite began to talk about the "exhaustion of the maquiladora model."<sup>7,8</sup>

### **Informal Sector**

The informal sector is an integral part of the Mexican economy and includes unofficial self-employed workers whose activities range from street vendors to independent contractors and small family-run businesses. According to the Institute of Statistics, Geography and Data (Instituto Nacional de Estadística, Geografía e Informática [INEGI]), approximately 6 million people and their families work in the informal sector. Other sources, such as the Workers University, put the total as high as 18 million.<sup>9</sup> These estimates are not included in Table 1. Although these workers in many cases perform work activities similar to formal-sector workers, what is particular to the informal sector is the absence of rights and social protection, including access to health insurance, pension benefits, and protection under the federal labor and health and safety laws. According to the National Program of Social Development proposed by current President Vicente Fox for 2001–2006, informal workers will have access to financing programs, but no programs have been developed to protect their health at work.

### **Child Labor**

In Mexico, as in many developing countries, child labor still occurs on a large scale, even though there are laws prohibiting children younger than 14 from working. Just in Mexico City, 14,322 children work illegally, according to a survey conducted by the federal System for the Whole Development of the Family (Sistema para el Desarrollo Integral de la Familia).<sup>9a,9b</sup> The survey found that 17% of the children suffer work-related accidents. Of the working children included in the survey, approximately 950 children work and live in the streets; the rest return to their homes. To the authors' knowledge, there are no programs implemented to address the occupational health issues that working children face.

## **HISTORY OF OCCUPATIONAL HEALTH AND SAFETY IN MEXICO**

### **Laws and Regulations**

The Mexican Revolution of 1910, a great popular upheaval of peasants and workers, thrust questions of workers' rights into prominence. The Constitution of 1917 enshrined workers' rights and protections in Article 123, making it the most progressive statement of its sort in the world at that time. The Constitution not only gave workers the right to organize unions and protected women and child laborers, but also established profit sharing and declared that workers should receive a living wage.<sup>10</sup> However, Constitutional Article 123 was not transformed into legislation until the adoption of the Federal Labor Law (Ley Federal del Trabajo [LFT]) in 1931. The LFT established a detailed set of laws and regulations overseen by the Secretary of Labor and the Federal Boards of Conciliation and Arbitration (Juntas de Conciliación y Arbitraje).<sup>11</sup> In addition, beginning in the 1930s, Mexico also became signatory to the International Labor Organization (ILO) key conventions.<sup>12</sup>

In terms of occupational safety, Article 123 of the Constitution required employers to make adequate information available to their workers, and defined their re-

sponsibilities for prevention and treatment of occupational injuries and illnesses. Based on this rather broad mandate, the initial and subsequent revisions of the Federal Labor Law have spelled out specific regulations to create the current Mexican Safety and Health Regulations.<sup>13</sup>

The 1931 LFT listed 40 work-related illnesses for which employers were responsible for prevention and treatment. The 1970 revision expanded this list to 171 illnesses associated with inhalation of dust and fumes, or exposure to chemicals and other risk factors.<sup>13,14</sup> This Law also included 49 articles related to occupational safety and health (OSH).<sup>14</sup>

In 1946, a New Regulation of Occupational Hygiene established that companies, unions, mixed commissions, physicians, and workers were required to observe its provisions, highlighting the importance of worker health surveillance. Article 15 of this Regulation established that employers should conduct medical exams for workers upon hiring, as well as follow-up exams. This implied that each company should have its own occupational medicine service. Article 17 established mandatory notification of work-related diseases to labor authorities. Article 22 established that workers should conduct activities that are appropriate to their capacity, knowledge, and skill levels. Maximum exposure limits were adopted for exposures such as noise. Articles 63, 66, and 70 provided guidelines to establish maximum exposure limits.<sup>14</sup>

In 1978, the General Regulation for Occupational Safety and Hygiene was published and served as a framework of the legal responsibilities for the Secretariats of Health and Labor to promote actions for the prevention and reduction of accidents and work-related diseases. It established that companies should have preventive medicine services under the direction of a physician in their facilities, and set standards for handbooks on prevention of work-related diseases.<sup>14</sup>

The General Health Law of 1984, modified in 1991, established workers' right to have their health protected. It stated that work should be adjusted to sanitary standards for the use and management of substances, to reduce the risks to personnel that may be exposed. It also established that the Health Secretariat should determine maximum permissible limits of exposure to pollutants for workers, and develop toxicology studies to sustain these limits. It also authorized the Health Secretariat to conduct sanitary control on facilities where occupational activities were conducted.<sup>15</sup>

The technical standard number 79 of 1987 referred to the epidemiological surveillance of health in the workplace, particularly for workers exposed to chemicals. For sanitation purposes, two lists of toxic substances were published.<sup>13</sup> In 1999, this technical standard was replaced by NOM-010-STPS-1999.

In 1997, Mexico enacted a new Federal Regulation on Safety, Health, and the Workplace Environment.<sup>16</sup> A major change accompanied this new regulation: greater emphasis was placed on the responsibilities of employers and employees rather than on the Secretariat of Labor. For example, this new law transferred much of the responsibility of enforcement to private, federally certified verification units. Employers are now required to hire private consultants, who have been certified as a verification unit, to monitor exposures and determine whether they are complying with the regulations. Government enforcement units now only examine the documents from the verification unit inspections and do not routinely conduct their own exposure monitoring measurements.

### **Social Security**

Mexico also developed an impressive national social security system. In 1942, the Mexican government created the Mexican Institute of Social Security, giving private-sector workers, principally industrial workers, a national health service and federal pensions. Later, a similar social security system was created for public em-

ployees, the Institute of Security and Social Services for State Employees, as well as for the workers of the state-owned Mexican Petroleum Company (Petróleos Mexicanos [PEMEX]) and for those in the military. Those not covered by one of those four systems received health services from the Secretariat of Health's hospitals and clinics, and from private clinics and hospitals.

By the 1970s, Mexico had one of the largest and most effective public health systems in Latin America.<sup>17</sup> In the 1990s, however, Mexico, like many other countries, experienced a shift in the population pyramid as birth rates declined, resulting in an inadequate working population to support the growing number of retirees. Mexico's social security system began to enter an economic crisis. This crisis led to the reform of the Mexican social security laws in the mid-1990s: the Mexican government reduced funding for the public social security system and enhanced the role of private insurance and healthcare corporations<sup>17</sup>

### Unions

In the 1980s it was estimated that about 30% of Mexican workers belong to unions; today the figure is put at 15%. In general, Mexican labor unions have not made occupational health and safety issues a priority, though there are a few notable exceptions. Most workers have little consciousness about safety and health issues. Many of the campaigns by labor unions have focused on obtaining financial benefits for those working in hazardous jobs, either through the use of hazardous pay bonuses or by lowering the retirement age.

Since the North American Free Trade Agreement (NAFTA), some Mexican unions have been influenced by their ties to Canadian and U.S. labor organizations, which are more aware of occupational health and safety. The Mexican Telephone Workers Union has done some OSH training in conjunction with the Communication Workers of America. The United Auto Workers Union of the U.S. has provided some occupational and safety training to the Authentic Labor Front, a small, independent Mexican labor federation.

### Enforcement of Legislation

One of the major challenges for Mexico is how to adequately enforce its ambitious legislation despite a shortage of trained occupational health professionals. In 1996, 20 graduate programs offered a curriculum in environmental or occupational health. Of these programs, 14 (70%) were considered applied (i.e., graduates are able to evaluate health risks and are usually hired by the private sector), and six (30%) trained graduates for academia and research. Of the programs offered, five were in occupational medicine, nine in occupational health, two in environmental health, and one each in ergonomics, mental health, safety and hygiene, and social medicine. Most of the programs have been established recently or have been offered intermittently.<sup>18</sup>

The number of professionals trained in occupational medicine and in safety and hygiene is limited in Mexico (Tables 2 and 3). Training resources are also limited and concentrated in only a few parts of the country.<sup>18</sup>

**TABLE 2.** Safety and Hygiene Professionals in Mexico, 2001

Professional	Number
Mexican hygienists certified outside Mexico	6
Mexican safety specialists certified outside Mexico	5
Individuals certified in "risk administration" in Mexico	52
TOTAL	62

Source: Santos-Burgoa, C. Antecedentes Históricos de la Salud Ocupacional. *Eur J Oncol* 4(5):531-536, 1999.

**TABLE 3.** Physicians Working in Occupational Medicine in Mexico

Professional	Number (Year)
Physicians with occupational medicine certification	1656 (2001)
Certified physicians who work in companies	800
Non-certified physicians who work in companies	12,000
Specialized physicians graduated from PEMEX	10 (1992–2000)
Physicians graduated from the graduate program in occupational medicine from IMSS	579 (1968–2000)

IMSS = Mexican Institute for Social Security, PEMEX = Petróleos Mexicanos

Source: Santos-Burgoa, C. Antecedentes Históricos de la Salud Ocupacional. *Eur J Oncol* 4(5):531-536, 1999.

Specialists in the areas of hygiene, safety, occupational medicine, and toxicology may be members of one or more of the 14 professional societies in occupational health that exist in Mexico.<sup>14</sup> Mexico does not have a specialized institution dedicated exclusively to research in OSH. The institutions currently conducting research in these areas are part of the Secretariat of Health and the Social Security institutions.

### CURRENT IMPACT

Mandated by the occupational injury and illness surveillance requirements described above, various agencies in Mexico issue reports on the number of work-related accidents and diseases. Although important, data provided by these institutions are absolute numbers, not incidence rates, making changes more difficult to interpret. Nonetheless, these reports provide a useful picture of the distribution of injuries and illness by type and industrial sector.

For the private sector, the Mexican Institute for Social Security (Instituto Mexicano del Seguro Social [IMSS]) provides an annual listing of economic activities with the highest number of work-related accidents and work-related diseases (Tables 4 and 5). Although it is likely, as with all official statistics, that underreporting exists, the data still reflect that certain industries require improved inspection and surveillance, as well as more effective preventive measures. These data do not include people employed in the informal sector.

Table 6 shows the causes for 3413 work-related accidents and diseases that occurred from 1996 to 2001 among employees of government-operated companies and federal employees, as provided by the Institute of Security and Social Services for State Employees (Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado). Of these injuries and diseases, 2124 involved the back, 1547 the ankle, 1353 the neck, 1112 fingers, 1024 the knee, 869 the head, and 1071 occurred in multiple locations.

### RISK MANAGEMENT POLICY

As described, the Mexican Constitution provides the legal mandate for the provision of OSH services. Based on this mandate, several laws have been passed. These laws give authority to two institutions to provide services and to enforce laws: the Secretariat of Labor and Social Welfare and the Secretariat of Health.

### Secretariat of Labor and Social Welfare

Mexican labor law in the private sector is codified as the Federal Labor Law (Ley Federal del Trabajo [LFT]).<sup>11</sup> The law primarily is enforced by the Secretariat of Labor and Social Welfare (Secretaria del Trabajo y Prevision Social [STPS]). Employers are obligated to follow these requirements, and if they are found to be in vi-

**TABLE 4.** Economic Activities With the Highest Number of Work-Related Accidents in Mexico, 2000\*

Economic Activity	Work-Related Accidents		Permanent Disabilities by Work-Related Accidents		Deaths by Work-Related Accidents	
	Cases	%	Cases	%	Cases	%
Construction of infrastructure works and public buildings	22,266	6.2	978	6.9	86	6.6
Food preparation and service	14,231	4.0	211	1.5	16	1.2
Construction of private buildings	13,851	3.9	608	4.3	86	6.6
Social security	13,711	3.8	152	1.1	5	0.4
Supermarkets and department stores	13,280	3.7	241	1.7	9	0.7
Professional services	12,360	3.5	307	2.2	37	2.8
Selling and buying of food, drinks, and/or tobacco products using transportation	11,382	3.2	289	2.0	52	4.0
Clothing manufacture	9,208	2.6	136	1.0	7	0.5
Manufacture of plastic products	8,006	2.2	479	3.4	10	0.8
Cargo transportation	6,712	1.9	302	2.1	149	11.5
Manufacture of metallic products with machinery	6,701	1.9	450	3.2	7	0.5
Selling and buying of construction materials, wood, steel, and hardware using transportation	6,691	1.9	250	1.8	27	2.1
Temporal lodging services	6,192	1.7	85	0.6	9	0.7
Manufacture and/or repair of wooden furniture and their parts	5,920	1.7	481	3.4	5	0.4
Agriculture	4,631	1.3	203	1.4	21	1.6
All other economic activities	201,583	56.5	9,030	63.6	773	59.5
TOTAL	356,725	100.0	14,202	100.0	1,299	100.0

\*Regulation for Industry Classification and Determination of Insurance Primes for Occupational Risks, 1998; excludes accidents en route

Source: Coordination of Labor Health, Instituto Mexicano del Seguro Social

olation, penalties can be imposed. Labor relations in maquiladora operations are also regulated by the LFT. Several components of the LFT which apply to OSH include:

- Employers are obligated to train workers, and one of the purposes of training must be to prevent work accidents. Moreover, the LFT requires that collective bargaining contracts at workplaces spell out this training requirement.
- Pregnant women and children younger than 18 years old are prevented from working in activities that could affect their life or their mental or physical health.
- Workers who suffer from an occupational injury have the right to medical assistance, rehabilitation, hospitalization, medicines and supplies, any needed prostheses and orthopedic devices, and compensation as provided by the law. The LFT states that employers should provide medical facilities within their plants, with size and capacity of the facility depending on the number of workers hired by the com-

**TABLE 5.** Economic Activities With the Highest Number of Work-Related Diseases in Mexico, 2000\*

Economic Activity	Work-Related Diseases		Permanent Disabilities by Work-Related Diseases**		Deaths by Work-Related Diseases	
	Cases	%	Cases	%	Cases	%
Extraction and processing of metallic minerals in deep mines	454	8.2	688	10.2	1	10.0
Manufacture and/or assembly of cars, buses, and trucks	384	6.9	390	5.8	1	10.0
Railroad and electric transportation	269	4.8	365	5.4		
Manufacture, preparation, spinning, knitting and finishing of textiles of soft fibers	246	4.4	272	4.0		
Basic iron, steel and non-ferrous metals industries	237	4.3	726	10.7		
Technical professional services	207	3.7	232	3.4	1	10.0
Extraction and processing of charcoal, graphite and non-metallic minerals in deep mines	188	3.4	298	4.4	3	30.0
Manufacture of rubber products	179	3.2	180	2.7		
Construction of infrastructure works and public buildings	145	2.6	168	2.5		
Generation, transmission and distribution of electric energy	123	2.2	149	2.2		
Manufacture of paper and/or cardboard and its derived products	120	2.2	130	1.9		
Manufacture, assembly and/or repair of railroad cars, railway equipment and its parts	107	1.9	113	1.7		
Manufacture of plastic products	90	1.6	91	1.3		
Manufacture of metallic products with machinery	89	1.6	96	1.4		
Basic industries of iron, steel and non-ferrous metals, using automated processes	73	1.3	74	1.1		
All other economic activities	2,646	47.6	2,791	41.3	4	40.0
<b>TOTAL</b>	<b>5,557</b>	<b>100.0</b>	<b>6,763</b>	<b>100.0</b>	<b>10</b>	<b>100.0</b>

\*Regulation for Industry Classification and Determination of Insurance Primes for Occupational Risks, 1998

\*\*Could include cases of permanent disability by work-related diseases in previous years

Source: Coordination of Labor Health, Instituto Mexicano del Seguro Social

pany. The employers will designate occupational physicians, but workers may oppose such designation.

- Safety and health committees consisting of an equal number of representatives of the workers and the employer shall be established as found necessary in every enterprise or establishment, to investigate the causes of accidents and diseases, propose preventive measures, and enable compliance.
- The LFT recognizes 161 pathologic conditions as work-related diseases (Table 7).

**TABLE 6.** Causes of Work-Related Accidents and Diseases  
Among Federal Employees in Mexico, 1996–2001

Activity, Act, or Agent	Accidents and Diseases	
	Number	%
Walking in the work area	2532	16.2
Vehicle transportation	2151	17.3
Vehicle driving	1690	10.8
Tool handling	1663	10.6
Climbing stairs	1653	10.5
Commissioned	1018	6.5
Lifting heavy weights	974	6.2
Drop or breakage of an object	618	3.9
Doing cleaning tasks	420	2.6
Factors inherent to work activities	312	1.9
Chemical agents	71	0.4
Other	2540	16.2
TOTAL	15,652	100.0

Source: Institute of Security and Social Services for State Employees

LFT, however, does not include the following pathologies: cardiovascular diseases, neurological conditions, renal diseases, endocrine diseases, gastrointestinal conditions, damage to the reproductive system, psychological alterations, ergonomic conditions, genetic alterations (only those associated to radiation exposure are included), other cancers (only skin, lung, bone, and leukemia associated to benzene exposure are included), diseases caused by exposure to UV radiation, and diseases caused by exposure to chemotherapeutic agents.

LFT lays out the general duties of labor inspectors, which are:

- To ensure compliance with the laws and regulations respecting the prevention of employment hazards and the protection of the workers' life and health;

**TABLE 7.** Classification of Work-Related Diseases in Mexico

I.	Pneumoconiosis or bronchiopulmonary diseases produced by aspiration of dusts or fumes of animal, vegetal or mineral origin
II.	Dermatosis or skin conditions caused by mechanical, physical, inorganic and organic chemical, or biologic agents that act as primary irritants, or sensitizers, or produce chemical burns; that present themselves in erythematous, edema, vesicular, eczema or crusting forms
III.	Professional ophthalmologic disorders or diseases of the ocular system produced by dusts or other physical, chemical or biological agents
IV.	Intoxications or diseases produced by absorption of dusts, fumes, liquids, gases or toxic vapors of organic or inorganic chemical origin, by respiratory, digestive or cutaneous routes
V.	Infections, parasitosis, mycosis and virosis; generalized or localized diseases caused by the action of bacteria, parasites, fungi or viruses
VI.	Diseases produced by mechanical factors and variations in the natural elements of the work environment
VII.	Diseases produced by ionizing or electromagnetic radiation
VIII.	Cancer or malignant neoplastic diseases due to the action of industrial carcinogens of physical or inorganic or organic chemical origin, or due to radiations of diverse location
IX.	Endogenous diseases or ailments derived from industrial fatigue

Source: Ley Federal del Trabajo, Diario Oficial de la Federación. January 21, 1998. Available at : <http://www.cddhcu.gob.mx/leyinfo/125/>.

- To report in writing any failure to comply with the above which may come to their knowledge; and
- To collaborate with the workers and the employer in publicizing and making generally known the rules respecting accident prevention and health.

Enacted in 1997, the Federal Regulation on Safety, Health and Workplace Environment (Reglamento Federal de Seguridad, Higiene y Medio Ambiente de Trabajo [RFSH]) establishes the rules and procedures for the enforcement of safety and health standards.<sup>16</sup> The RFSH is intended for application throughout Mexico and has as its purpose the establishment of measures necessary for the prevention of workplace accidents and illnesses. Its objective is to ensure that work takes place under conditions of safety and health that are appropriate for workers and in accordance with the LFT and international treaties ratified by Mexico.

The RFSH addresses the development and enforcement of standards known as Official Mexican Standards (NOMs) on the full range of OSH issues. The NOMs cover matters ranging from specific hazards to technical specifications for protective and monitoring equipment and analytical methods. STPS is responsible for enforcing the LFT and developing and enforcing the appropriate NOMs in the area of occupational health and safety.

STPS has issued a number of NOMs in three general areas: safety, hygiene, and labor organization.<sup>19</sup> Safety NOMs cover features related to the conditions of facilities and buildings; materials; machinery, tools and equipment; fire control; electric systems; and mining. Labor organization NOMs deal with first aid, safety commissions, personal protective equipment, signs and warnings, and accident reports. Hygiene NOMs establish conditions for use and handling of chemicals, physical agents, and sampling methods.

NOM-010-STPS-1999, Health And Safety Measures in Workplaces that Handle, Transport, Process or Store Chemical Substances Capable of Contaminating the Workplace Environment, establishes permissible exposure limits (PELs) for 561 chemicals in the workplace.<sup>20</sup> These PELs were adopted mostly from previously published limits recommended by the American Conference of Governmental Industrial Hygienists. The NOM directs employers to measure contaminant concentration levels based on methods laid out in the standard and to keep such information current. It requires employers to inform workers of the risks to which they are exposed and to train them in the safe use of chemicals.

### **Secretariat of Health**

Mexican health law in the private sector is codified as the General Health Law (Ley General de Salud [LGS]).<sup>15</sup> The LGS regulates the right to health of the individual as provided for in the Mexican Constitution. It mandates that all work activities must be carried out respecting rules laid out by the Secretariat of Health (SSA). The LGS indicates that any type of workplace, including subsidiaries, is covered under the LGS. Some of the specific occupational components of the LGS are:

- The federal government has the power to protect environmental health and to work with the states to protect health and provide health services in certain areas, including instances where toxic substances and hazardous materials are used.
- The SSA should coordinate with labor authorities at state and federal levels to undertake studies and develop programs to prevent occupational accidents and injuries.

- The SSA has the authority to engage in sanitary control, such as training, monitoring, and taking samples, and has the authority to apply sanctions when necessary.
- The SSA is mandated to publish a list in the Official Daily of the Federation (*Diario Oficial de la Federación*) of dangerous and toxic substances. Two lists have been published.
- Labels are required for toxic and dangerous materials; they must identify the materials and give handling and emergency instructions in Spanish.

The LGS is enforced through a variety of methods, including regular and special verification visits. These visits are intended to verify that potentially toxic substances used in the workplace do not adversely affect worker health, and to investigate workplace accidents. The LGS mandates that during such a visit, the employer must appoint two witnesses to accompany the inspector during the inspection; the inspector must record problems found in writing; and the employer must be given an opportunity to make written comments about the inspector's report. Procedures for taking samples, if necessary, have been described.

SSA has issued a number of environmental health NOMs. In the occupational area, NOMs have been issued establishing the maximum PELs for organic solvents (xylene, toluene, benzene). NOMs have also been issued to establish the standardized method for risk evaluation at the workplace due to environmental agents, and to establish sanitary requirements for use of personal protective equipment in the workplace.<sup>21</sup>

In 2001, the Federal Commission for Protection against Sanitary Risks was created. Its creation decree established that the General Directorate of Environmental Health, in coordination with other agencies, has the authority to conduct studies and establish PELs, to publish standards, criteria, and guidelines; and to promote social agreement, risk communication, and community participation in occupational health.<sup>21a</sup>

The National Health Program 2001–2006 aims to improve the health conditions of formal and informal workers by promoting preventive health measures, integral attention of workplace accidents, and modernization of occupational legislation.<sup>25</sup> To do so, the current administration proposed a Strategic Policy of Labor in National Health (*Política Estratégica del Trabajo a la Salud Nacional [PETSAN]*), whose principles are:

- Strengthening of occupational legislation
- Establishment of an occupational surveillance system with participation of industries, federal, and state government agencies and health services
- Strengthening of training and research in occupational health.

The goals of the PETSAN are:

- To attend to and solve 65% of occupational diseases
- To solve 75% of labor accidents
- To increase by 40% the certified medical and non-medical personnel working in the area
- To integrate a modern normative force in occupational health.

### **Mexican Institute of Social Security (IMSS)**

IMSS is a decentralized agency that, along with local government agencies, is responsible for administering Mexico's Social Security Law (*Ley del Seguro Social [LSS]*).<sup>22</sup> Mexican social security covers an employee's medical expenses, worker's compensation, and age and disability pensions. The LSS:

- Defines an occupational illness as a pathological condition arising out of or in the course of employment or attributable to the environment in which the employee is required to work. All diseases classified in the Federal Labor Law as occupational diseases are work-related diseases.
- Outlines the monetary benefits an employee may claim through the compulsory social insurance plan. An insured person who suffers a non-work-related illness is entitled to monetary benefits, as long as the person remains unfit for work.
- Requires employers to allow IMSS to visit and inspect the premises. It also requires employers to notify IMSS of all work-related accidents and illnesses.
- States that IMSS shall work with STPS and federal and state agencies to carry out occupational safety and health programs.

The LSS gives IMSS authority to conduct occupational safety-related research at its discretion and recommend to employers effective means of preventing job-related injury and illness in their workplace. Also, it outlines several ways employers should work with IMSS to promote occupational safety programs. Since IMSS provides medical services to private employees, the Medical Services Regulations (Reglamento de Servicios Médicos [RSM]) establish the procedures for the provision of medical services.<sup>23</sup> The medical services provided by IMSS are a three-tier system. Patients are referred from one level to the next based on the level of care required by the patient, with each level offering a higher degree of technologically advanced treatment. The RSM covers medical attention for work-related risks.

In regard to the role of IMSS in the prevention of workplace injuries and illnesses, RSM states that IMSS will provide information, advice, training, and technical support, in an effort to avoid work-related injuries and illnesses. It also establishes that IMSS should encourage coordination with STPS on programs aimed at minimizing work-related hazards.

### ADMINISTRATIVE PROCEDURES

The General Regulation for Inspections and the Application of Sanctions for Violations of Labor Legislation of 1998 (Reglamento General para la Inspección y Aplicación de Sanciones por Violaciones a la Legislación Laboral [RGIASVLL]) governs inspections and sanctions in regard to occupational safety and health in Mexico.<sup>24</sup> RGIASVLL establishes the requirement for STPS to conduct initial, periodic, and verification inspections, and also empowers authorities to conduct special inspections. *Initial inspections* are first-time visits conducted at new workplaces. *Periodic inspections* are generally conducted on an annual basis. *Verification inspections* are conducted to determine whether companies have implemented remedial actions ordered during periodic inspections. *Special inspections* take place if authorities learn of possible labor law violations, dangerous working conditions, or the occurrence of accidents in the workplace, or if inspectors are provided with false information or are threatened by employers during periodic inspections. RGIASVLL imposes a minimum 1-day advance notice requirement for inspections.

The Federal Law of Measurements and Standards (Ley Federal sobre Metrología y Normalización [LFMN]) of 1992, establishes the Official Mexican Standards (NOMs) that will be used to implement the LFT and the LGS.<sup>25</sup> The LFMN established a uniform and transparent procedure for issuing mandatory NOMs. To this end, it established the National Standardization Commission (Comisión Nacional de Normalización) and the National Accreditation System of Standardization Institutions (Sistema Nacional de Acreditamiento de Organismos de Normalización). Since this law was passed, a number of NOMs have been revised.

The LFMN also establishes the requirements for the private verification units that conduct plant monitoring under RFSH. It lays out the accreditation requirements for verification units. According to LFMN, special evaluation committees that are overseen by the Secretariat of Trade (Secretaría de Economía) and the National Standardization Commission determine whether the units meet accreditation standards. LFMN states that verification units and accreditation agencies must meet professional standards.

### **INTERNATIONAL AGREEMENTS RATIFIED BY MEXICO**

The International Labor Organization has developed and enacted a number of international conventions addressing OSH. Mexico has ratified<sup>78</sup> conventions, of which 68 remain in force.<sup>12</sup> **The International Covenant on Economic, Social and Cultural Rights** was adopted by the United Nations General Assembly on December 16, 1966, and signed by Mexico on March 23, 1981.<sup>26</sup> It commits signatories to the recognition that all people have the right to safe and healthy working conditions. Also, it states that signatory countries must take steps to see that rights spelled out in the covenant are protected.

**The Universal Declaration of Human Rights** was adopted by all the members of the UN General Assembly, including Mexico, on December 10, 1948.<sup>27</sup> The Declaration states that everyone has the right to just and favorable conditions of work, and that everyone has the right to security in the event of disability.

**The American Declaration of the Rights and Duties of Man** was adopted by Mexico at the 9th International Conference of American States at Bogota in 1948.<sup>28</sup> It states that every person has the right to preservation of his health through sanitary and social measures relating to food, clothing, housing, and medical care, to the extent permitted by public and community resources.

**The Protocol of San Salvador**, also known as the “Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social, and Cultural Rights,” was signed by Mexico on November 17, 1988, in El Salvador.<sup>29</sup> It affirms that while everyone has the right to work, they have the right to work under just and satisfactory conditions and specifically the right to safety and hygiene at work. Also, it states that people have the right to social security in case of accident or injury at work, and that everyone has the right to health, including the prevention and treatment of occupational disease.

On January 1, 1994 the **North American Free Trade Agreement** went into effect, creating a free trade zone and allowing for the free flow of goods, but not labor, among Canada, the United States, and Mexico. **The North American Agreement on Labor Cooperation (NAALC)** was negotiated as a supplemental labor agreement to NAFTA.<sup>30</sup> The NAALC includes various articles related to occupational safety and health, including the obligation of each country to appropriately enforce its own labor laws and provide access to all legally recognized parties to tribunals to enforce the law. As part of NAALC, each country established a National Administrative Office (NAO), which receives and investigates complaints from parties in any of the three countries concerning possible violations of NAALC. If an NAO finds merit in a complaint, it can ask for ministerial consultation with the Secretary of Labor of the offending country. Since 1994, several complaints have been brought against Mexico regarding its enforcement of OSH laws. A review of the findings of the investigations of the U.S. and Canadian NAOs provide useful information regarding Mexico’s occupational health program.

In 2001, the independent human rights organization Human Rights Watch evaluated the success of the NAFTA labor side agreement.<sup>35</sup> A key element of this evaluation was a review of the 23 official complaints filed under the NAALC. Of these

23, six complaints alleged some violations of the articles covering OSH, and three were especially focused on safety and health.

The findings of the U.S. NAO in the complaint concerning a facility that manufactures chassis and platforms for tractor-trailer trucks in Tijuana, Baja California State, focused on issues of the efficacy of Mexican safety and health inspections. Although the inspectors found various safety and health violations and fines were issued, they found no evidence that the fines were collected.

The complaint concerning an auto parts factory in Ciudad de los Reyes, Mexico State was investigated by both the U.S. and Canadian NAOs. The U.S. found serious problems with the efficacy of the inspection. They also noted that fines were minimal, and they could not ascertain if they were collected. The Canadians had similar findings, but also noted deficiencies in the availability of information on chemical substances and the use of adequate personal protective equipment.

The findings of the third case, which involved two export-processing factories that sew leather covers on steering wheels and gearshifts in the cities of Matamoros and Valle Hermoso, in Tamaulipas State, were decided after the release of the Human Rights Watch report. These complaints focused primarily on safety and health. The NAO findings again indicate deficiencies in the efficacy of the Mexican government's health and safety programs, including:

- Worker interviews were not confidential, raising questions about how free the workers were to criticize the company.
- The procedures for certifying the third-party verification units that performed the exposure monitoring were not clear.
- Inspections relied on review of company records, without performance of independent tests or monitoring.
- STPS did not communicate openly with workers who filed complaints or requested information.
- IMSS failed to document safety and health problems.

## **INTERNATIONAL COLLABORATION**

As a result of geographic and cultural proximity, there has been a long history of collaboration between Mexican and U.S. institutions in a wide variety of social and scientific projects including, recently, OSH. This collaboration has taken place on many levels: university based, government to government, through international organizations, and by non-governmental organizations including labor unions and community-based organizations. The major focus of most of these collaborations has been to develop the capacity of Mexican university and government researchers, technicians and inspectors, and community-based advocates and workers to understand and implement the principles, laws, and practice of OSH.

### **University Programs**

Several Mexican universities have ongoing international collaborations, but one of the most important and coordinated efforts has been funded through the Fogarty International Center of the U.S. National Institutes of Health. In 1995, with financial and technical assistance from NIOSH, the Center for Environmental Health of the Centers for Disease Control and Prevention, the National Institute of Environmental Health Sciences, and the Environmental Protection Agency, several U.S. Universities were funded to develop training programs in conjunction with developing countries including Mexico. The Schools of Public Health of the University of Texas, the University of California at Los Angeles, and the Mt. Sinai

School of Medicine were initially funded to initiate programs with Mexico; the University of Massachusetts at Lowell and the Rollins School of Public Health at Emory University were added in 2001. These groups have developed graduate and fellowship training programs in the U.S. for Mexican nationals, as well as short courses offered in Mexico. As of 1999, 40 pre- and post-doctoral trainees from Mexico had been trained in the U.S. Also, 25 courses involving 1481 trainees and 24 U.S. faculty were offered in Mexico.<sup>31</sup>

### **Government to Government**

The passage of NAFTA gave a strong impetus for increased collaboration between the U.S., Canada, and Mexico on occupational and environmental health issues. Activities included the development of documents comparing the three countries' OSH programs and U.S. Occupational Safety and Health Administration training institute courses held in Mexico, as well as tri-national conferences on specific topics such as child labor, agricultural workers, and the electronics industry. In 1995, NIOSH began a 5-year project in collaboration with the Pan American Health Organization to develop a variety of training and technical assistance initiatives with Mexican governmental agencies and research institutions. Additionally, the U.S.-Mexico Border XXI initiative was started, which included an initiative on environmental health featuring projects related to training in clinical toxicology and occupational health.<sup>32</sup>

### **International Organizations**

The Pan American Health Organization (PAHO), the regional office of the World Health Organization, has initiated projects in OSH throughout Latin America, including Mexico. PAHO has an office dedicated entirely to the U.S.-Mexican border that addresses the entire array of public health problems, including occupational and environmental health. Until 1998, the PAHO regional center for environmental and occupational health (The Pan American Center for Human Ecology and Health) was located in Mexico.

The Workers' Health Program was adopted by all Latin American countries in 1999.<sup>33</sup> It emphasizes:

- Primary prevention of exposures where the workers live and work
- Development of policies and legislation to improve workers' health
- Adoption of workplace health promotion activities
- Improvement of access to and quality of workers' health services.

One area of focus for the workers' health program has been the improvement of surveillance systems in Mexico. Moreover, the surveillance systems could be used to develop estimates of the burden of disease attributable to occupational health factors.

### **Non-Governmental Organizations**

Although there is a long history of international collaboration between non-governmental organizations in Mexico and abroad, the period of development of the maquiladora industries along the U.S.-Mexican border and the subsequent passage of NAFTA has led to a dramatic increase in non-governmental activities, having a particular effect on environmental and safety and health. In 1993, the Maquiladora Safety and Health Support Network was created at a meeting of the American Public Health Association. It has grown into a network of over 400 occupational health professionals and community organizers who provide volunteer training and technical assistance on labor issues.<sup>34</sup>

## CONCLUSION

Many Mexicans are employed in the manufacturing industry, and some of them are exposed to high-risk of injury and disease. Many people are also employed in small traditional activities and the informal economy, which are difficult to regulate. While OSH has not always been a high priority, new challenges due to NAFTA and its insertion in the global market seem to have resulted in more active participation in OSH.

New challenges for occupational safety and health in Mexico include:

- Promoting preventive policies for safety risks at all levels: from employers and workers to professionals in OSH. Health promotion in *specific* activities or industries with high injury and disease rates may have a higher impact than a general intervention.
- Coordinating actions and clearly defining responsibilities of the three government agencies involved in occupational safety and health in Mexico (STPS, SSA, and IMSS). Regulations and standards must be harmonized, to enforce them more effectively and to develop prevention policies.
- Improving surveillance systems to address the most important health and safety concerns. Surveillance data should be used to evaluate the effectiveness of intervention efforts such as enforcement and regulatory acts, and to target new problems and research needs.
- Increasing the number and qualifications of trained professionals in OSH. Cooperation between industries, government, and academia is required to identify training needs. Resources should be built up and training offered at the regional level.
- Enhancing work inspections and enforcement of fines. Developing training programs for inspectors.
- Expanding the current list of professional diseases, as specified by LFT. There is a need to open and adapt this list to new production activities and new occupational diseases.
- Improving, stimulating, and disseminating research in OSH. Research in this area should identify the needs and specific problems of specific working populations, particularly those at higher risk of injury or disease. Intervention research in occupational safety and health should take precedence.
- Developing occupational injury and illness surveillance and prevention programs aimed at the informal sector. These programs should target the highest-risk populations, including children.

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