

# Occupational Health in Mexico

FRANCISCO RAÚL SÁNCHEZ-ROMÁN, MD, MSC,  
CUAUHTÉMOC ARTURO JUÁREZ-PÉREZ, MD, MSC,  
GUADALUPE AGUILAR MADRID, MD, MSC, LUIS HARO-GARCÍA, MD, MSC,  
VÍCTOR HUGO BORJA-ABURTO, PHD, LUZ CLAUDIO, PHD

This article describes the current situation of occupational health (OH) in Mexico, including socioeconomic context, legislation, health system, and educational and investigative resources, as well as the practice of OH. Workplace accidents per 100 workers decreased from 7.23 to 2.3 workers in 20 years; deaths decreased from 1.68 to 0.9 per 10,000 workers, while the occupational disease rate increased from 0.6 to 1 per 10,000 workers. This can be interpreted as an improvement in preventive measures as well as problems of recognition and registry. In Mexico OH faces challenges that range from needs for professional training and performance to needs for development of legal measures, coordination, information, and research. *Key words:* occupational health; occupational medicine; social security; Mexico.

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Occupational Health (OH) in Mexico has expanded significantly since the creation of the Institute of Social Security in that country. During this time and notwithstanding the fact that it has seen important advances, OH has not met the health needs of the Mexican worker population and continues to be limited with regard to the impact of providing health services. We describe OH in Mexico in its general context, the main statistics available, needs for education and training, and the current practice of OH.

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Address correspondence and reprint requests to: Francisco Raúl Sánchez-Román, MD, Av. Cuauhtémoc #330, Edificio C, Coordinación de Salud en el Trabajo, 1er piso, Centro Médico Nacional Siglo XXI, Instituto Mexicano del Seguro Social, Col. Doctores, Deleg. Cuauhtémoc, 06725 México, D.F., México; telephone: (+52) (55) 5761-0725, 5530-8260; fax: (+52) (55) 5538-7739; e-mail: <raul.sanchezr@imss.gob.mx>.

## CHARACTERISTICS OF THE POPULATION

Mexico has a population of approximately 100 million inhabitants, of whom 46% are males and 54% females. In one decade (1990–2000), the percentage of adults and the elderly in Mexico increased 1.2%, with a life expectancy of 75 years.<sup>1</sup> By the end of 2004, the worker population by economic sector was distributed as follows: mining, agriculture, livestock, and related occupations, 16.2%; transportation industry, 24.1%; service industry, 59.3%. The economically active population (EAP) represents 42% of the entire population, of whom 35% are women. The proportions of the EAP who do not have social security insurance are estimated at 31% of women and 69% of men, who are underemployed or who work in the informal economy. Unemployment during 2004 was 3.74%,<sup>2</sup> which in general terms could be considered low, but underemployment is enormous (39% of the EAP). This favors informal work settings and the migration of the work force mainly to the United States, where workers of Mexican origin included in the U.S. Census amounted to 10% of the Mexican EAP in 1980, 13.5% in 1990, and 20% in 2000. Monies remitted by migrant workers to their families in Mexico increased from \$3,673 million U.S. (USD) in 1995 to \$16,612 million USD in 2004, rendering this one of the principal sources of foreign currency income in the country.<sup>3</sup>

## OCCUPATIONAL HEALTH LEGISLATION AND AUTHORITIES

Although it has been more than ten years since the signing of the North American Free Trade Agreement (NAFTA), which establishes economic exchange between Mexico, Canada, and the United States, the agreement has yet to reach its full potential. The challenge continues to be one of integrating the economies of the three countries, despite the inequalities of their respective levels of income, wealth, and development, and to protect the health of workers in the process.

Article 123 of the Political Constitution of the United States of Mexico establishes worker and employee rights and obligations and also separates workers into two groups: Group A is composed of private-sector workers, and Group B includes government

workers. The governing law for Group A is the *Ley Federal del Trabajo* (National Labor Law, LFT); for Group B the governing law is the *Ley de los Trabajadores al Servicio del Estado* (State Workers Law, FSS). The LFT establishes the obligations of employers and workers with respect to basic safety and hygiene conditions in the workplace, and includes a list of 161 occupational diseases, along with a guide for determination of functional and anatomic losses, permanent disabilities associated with injuries and occupational diseases.<sup>4</sup> This law is utilized as a general guide for cases of workers' compensation for national and state government workers as well. The *Reglamento Federal de Seguridad, Higiene, y Medio Ambiente de Trabajo* (National Safety, Hygiene, and Occupational Environment Law) sets forth the bases for OH services organization and protections for child laborers and pregnant and breastfeeding women, as well as surveillance, inspection, and administrative sanctions.<sup>5</sup> As a member of the International Labor Organization (ILO), Mexico has ratified most OH-associated agreements and recommendations.

At present, the *Secretaría del Trabajo y Previsión Social* (Mexican Work and Social Security Secretariat, STPS) is the governmental agency in charge of establishing and enforcing OH-related norms, as well as setting permissible limits for occupational exposures, and calling together worker representatives, private businesses, institutions of higher education, and health personnel; nonetheless, its surveillance capacity is limited. Additionally, the *Secretaría de Salud* (Mexican Health Secretariat, SSA) does not play a relevant role in OH-related regulation and surveillance. This sets a wide gap between the laws as they are laid out in the statutes and the actual implementation and enforcement of these laws.

## THE HEALTH SYSTEM

The health system in Mexico is composed of private and public institutions with various levels of responsibility for workers' protections. The formal sector of the population that includes workers in private businesses and in the national and state governments possesses social security institutions that guarantee care for life contingencies such as diseases and occupational injuries, general or common diseases, maternity, disability, old age, death, work cessation at an advanced age, and retirement.<sup>6</sup> These institutions are financed by worker, employer, and government contributions and distinguish between the two types of workers.

The largest form of health insurance for workers is dictated by the *Ley del Seguro Social* (Social Security Law, LSS). Signed into law in 1943, it established the obligation of the private sector to provide social security for its workers. The *Instituto Mexicano del Seguro Social* (Mexican Institute of Social Security, IMSS) is the institution charged with providing medical, economic, and social services to private-sector workers (Group A Workers).

IMSS is the largest social security institution in Mexico and at present provides services to more than 800,000 businesses and their more than 12 million workers (30% of the EAP), as well as their beneficiaries; this represents coverage of 40% of the entire population of the country.

The Federal Government provides services to its workers through the *Instituto de Seguridad y Servicios Sociales para los Trabajadores del Estado* (Institute of Security and Social Services for State Workers, ISSSTE), which provides care for 2.5 million workers, reaching 5.9% coverage of the total population of Mexico. Other government-related institutions, such as *Petróleos Mexicanos* (Mexican Oil Company, PEMEX), the Armed Forces, and the Navy, possess a distinct health system that covers 1.1% of the population. Finally, Mexican state governments also provide social security services to their workers. Some states have their own institutions, while others subcontract through another social security institution. This type of state coverage involves less than 1% of the population.

Half of the Mexican population has no access to medical coverage. Medical care for the uninsured workers is provided by health institutions subsidized by the government at public state institutions, the IMSS, or by charitable institutions. Recently, a popular insurance policy was put into effect that offers low-cost limited coverage to the low-income population who do not have medical coverage from their employers, or those who work in the informal economy where coverage is not available.

There is also a growing private care system in Mexico that provides coverage for catastrophic and routine medical expenses, payment-per-service, and prepaid or co-paid medical care services. These types of coverage have increased over the past several years due to the growing tendency of the health sector to open up to private investment. Most of these services are administered by insurance companies and do not include OH at present. It is estimated that this system provides coverage to 1.1% of the population in Mexico.

## OCCUPATIONAL MEDICINE TRAINING AND RESEARCH RESOURCES

Education and training of human resources in occupational medicine (OM) and in safety and industrial hygiene (SIH) have been scarce and do not meet the needs of the country. At present, 50% of medical schools in Mexico include some OH curriculum in their programs, usually one course of a few hours' duration, and few promote practical training in enterprises during the last year of the education. At the postgraduate level, there are two courses in OM in Mexico: one has been sponsored by the IMSS since 1968 and the other by PEMEX since 1995. At present, the IMSS is training 50 OM specialists per year at five sites, Mexico City, Jalisco, Nuevo León, Guerrero, and Veracruz; PEMEX participates in the training of eight OM specialists at two cam-

puses (Tamaulipas and Mexico City). The course of study is two years in duration and the curriculum is based on the disciplines of occupational pathology, toxicology, epidemiology, safety and industrial hygiene, sociology, and legislation.<sup>7</sup> Each campus receives accreditation from the corresponding state university.

The total number of OM specialists who had completed residencies in the field as of February 2005 was 699. It is estimated that 610 of them continue to be active in the field, 52% working at the IMSS and the remainder at other social security institutions, private businesses, or combinations of both. In addition, there are two university-level OM specialty courses, from which over 60 specialists were graduated. These courses, promoted by public universities in Aguascalientes and Chihuahua, provide an alternative option to residency courses for physicians employed at private companies.<sup>8,9</sup>

In the areas of training in industrial safety, there are two types of undergraduate programs, one specialty program and eight master's-degree programs, that are sponsored by public and private universities, with more than 1,000 professionals who have graduated in this area. Training in industrial hygiene and occupational toxicology is more limited because there are no specific training courses.<sup>10</sup> There exist at present two specialization courses in occupational nursing and a specialty in ergonomics, but there are no specific specialty courses for related areas such as social work, and the participation of psychologists is limited.

The certification process for professionals in OM is relatively recent because there is a need to guarantee the performance of these professionals, and there are a limited number of senior OM professionals who can oversee these certifications.

In the medical area, there is a National Registry System that evaluates the practice of the profession, including undergraduate degrees, specialties, and subspecialties, along with master's and doctoral degrees. The professional certificate (national license) for the OM specialty is awarded by the *Secretaría de Educación Pública* (Mexican Public Education Secretariat, SEP) after completion of the specialty course. The *Consejo Mexicano de Medicina del Trabajo*, A.C. (The Mexican Board of Occupational Medicine, CMMT), created in 1985, is an independent, nongovernmental organization that evaluates and certifies physicians in OM. Currently, graduates of formal specialization courses and physicians with two years of practical experience in OM and 500 hours of coursework related with the specialty have the opportunity to obtain initial certification awarded by the CMMT and subsequent recertification every five years. During the period 1999–2001, over 1,600 physicians were certified and received a national license in OM. These physicians included individuals without formal training in OM, but who meet the CMMT-established requirements.<sup>11</sup> It is estimated that 9,000–12,000 physicians work in private-sector enter-

prises and the majority have no training in OM, despite the fact that there had been a 50% increase in the number of OM-certified physicians in Mexico during the 1998–2000 period.<sup>12</sup>

In the field of SIH, the *Consejo Mexicano de Profesionales Certificados en Administración de Riesgos*, A.C. (Mexican Board of Certified Risk Administration Professionals) is the body that certifies professionals responsible for workplace safety and hygiene and that requires initial examination and recertification every three years for either of its two modalities. In coordination with some of the universities in the country, the STPS offers courses in health and occupational safety directed toward personnel employed at technical- and professional-level companies.<sup>13</sup> There are 11 university-level, multidisciplinary-focused master's-degree programs in OH that contribute to knowledge in the different areas involved in worker health care. The majority of the 32 Mexican states have one or more societies or associations in the different OH fields, especially in OM, SIH, and nursing, and there are over 20 professional associations throughout the country that promote academic activities among their members.

The development of research programs in OH is scarce. There exist few sources of financing for research projects, and these are essentially limited to funding awarded by the *Consejo Nacional de Ciencia y Tecnología* (National Board of Science and Technology, CONACYT), the IMSS, and the ISSSTE. OH professionals interested in the development of research projects often carry out their research with personal resources. Although research publications in the field have increased during the past decade, production continues to be scarce and possesses limited methodologic rigor, with an average of four to five articles per year, the majority of articles published by health institutions.<sup>14,15</sup> There is no national agenda concerning research lines or areas in OH due to the lack of an integration of interests among training, health, and governmental institutions.

## THE PRACTICE OF OCCUPATIONAL HEALTH

Occupational health professionals and technicians are employed at diverse sites such as private businesses, social security institutions, governmental agencies, and institutions of higher education, and as independent consultants.

At private companies, the principal incentive for establishing OH services is to decrease absenteeism and reduce the cost of the work-risk insurance premium, which is based on severity-index and work-risk frequencies.<sup>16</sup> The general perception is that OH preventive activities are obligatory measures on the part of employers.

At the government social security institutions, although preventive actions are contemplated, the main

**TABLE 1 Rates of Occupational Risk, Permanent Disabilities, Death, and Disease Registered at the IMSS, 1985–2004**

Year	Workers with Occupational Risk	Occupational Risks/100 Workers			Permanent Disabilities/1,000 Workers			Deaths/10,000 Workers			Disability Pensions/1,000 Insured Workers†
	Insurance	OA	IA	OD	OA	IA	OD	OA	IA	OD	
1985	6,516,928	7.23	1.07	0.06	1.63	0.14	0.59	1.68	0.44	0.015	4.2
1986	6,680,200	7.73	1.27	0.07	1.98	0.19	0.64	1.81	0.56	0.020	4.7
1987	7,098,896	7.28	1.24	0.07	1.75	0.19	0.65	1.61	0.55	0.015	4.7
1988	7,486,947	6.63	1.13	0.05	1.66	0.17	0.43	1.64	0.53	0.010	5.2
1989	8,023,144	6.28	1.11	0.04	1.59	0.16	0.42	1.26	0.37	0.013	4.7
1990	8,703,149	5.75	1.04	0.04	1.43	0.12	0.38	1.18	0.34	0.007	3.5
1991	9,142,688	5.52	1.00	0.07	1.52	0.12	0.63	1.38	0.41	0.018	3.4
1992	9,995,621	5.38	0.97	0.08	1.52	0.13	0.74	1.36	0.41	0.014	3.5
1993	9,783,854	5.03	0.95	0.07	1.54	0.14	0.71	1.34	0.42	0.008	3.4
1994	9,027,717	4.78	0.91	0.07	1.42	0.12	0.72	1.35	0.36	0.003	2.4
1995	9,335,187	4.09	0.86	0.04	1.43	0.13	0.43	1.28	0.32	0.008	2.1
1996	10,134,368	3.48	0.77	0.02	1.12	0.09	0.26	1.04	0.28	0.004	1.8
1997	10,933,550	3.18	0.74	0.02	1.03	0.08	0.23	0.95	0.33	0.002	1.5
1998	11,608,140	2.87	0.67	0.02	0.91	0.07	0.19	1.00	0.27	0.008	1.3
1999	12,476,677	2.75	0.66	0.03	0.91	0.07	0.38	0.92	0.25	0.007	1.1
2000	12,698,939	2.87	0.74	0.04	1.14	0.09	0.54	1.05	0.35	0.008	1.2
2001	12,599,681	2.70	0.70	0.045	1.00	0.10	0.50	0.90	0.30	0	1.2
2002	12,245,209	2.50	0.70	0.037	1.10	0.10	0.50	0.90	0.30	0.003	1.3
2003	12,169,503	2.30	0.60	0.10	1.00	0.10	0.80	0.90	0.30	0.003	1.2
2004	12,297,653	2.30	0.60	0.10	1.00	0.10	0.70	0.90	0.20	0.001	1.2

\*OA = work accidents, IA = in-transit accidents, OD = occupational diseases.

†Non-professional diseases.

activities are oriented toward medical care and workers' compensation, and indemnization for injuries. The principal function of the physician is to certify occupational accidents and diseases and to evaluate the physical conditions of workers to determine the awarding of pensions or indemnity, and to review workers' legal claims.

Professionals and technicians in the field of safety and hygiene have the responsibility for implementing preventive activities in high-risk enterprises. Safety and hygiene technicians and professionals are entrusted with performing preventive actions in companies with high risks of disaster, which represent 1% of all IMSS-affiliated companies. These professionals also conduct support studies to confirm occupational exposures and accident reconstructions in view of worker claims.

## DATA ON OCCUPATIONAL HEALTH

The majority of social security institutions do not have public information systems, or if they do, these are very limited. The IMSS, which provides the broadest OH services, has developed its own information system whose data are used as national referents. Although the IMSS database is the most comprehensive in Mexico, it represents information about only 30% of the EAP.

In 2004, a total of 12,297,653 workers were registered with IMSS by 804,389 enterprises.<sup>17</sup> Of the total IMSS-affiliated companies, 0.9% were large companies that employed the highest percentage of workers (41.6%), followed by small enterprises that represented 10.6% of all IMSS-affiliated companies and employed 24.3% of

workers. The medium-sized companies comprised 1.5% of the total and employed 14.1% of workers, and the micro enterprises, which constituted 87% of all IMSS-affiliated companies and employ 20% of IMSS-registered workers.<sup>18</sup> These data are in contrast to the 2002 *Escuesta Nacional de Microempresas* (National Micro-enterprise Survey) conducted by the *Instituto Nacional de Estadística, Geografía e Informática* (National Institute of Statistics, Geography, and Informatics, INEGI) and the STPS, which reported data on more than 4 million businesses, of which 99% corresponded to the micro-, small, and medium-sized enterprises that generate 76% of jobs.<sup>19</sup> This indicates that a large number of workers in micro, small, and medium-sized companies are not registered and do not receive social security services.

IMSS-affiliated workers come from the following economic activities: manufacturing industry (31.5%); personal and home services (22.4%); commerce (20.7%); construction industry (8.8%); social and community services (6.8%); transport and communication (5.6%); agriculture, cattle management, forestry, hunting, and fishing (2.3%); electrical industry and potable water distribution (1.3%); and extraction industries (0.6%). The ratio of men to women with work-risk insurance coverage is 2:1.<sup>20</sup>

The LFT and the LSS establish that occupational risks (OR) are accidents and diseases to which workers are exposed during the performance of or directly due to their jobs. Occupational accidents (OAs) include accidents that occur during the time the worker is in transit from his or her home to the workplace and from

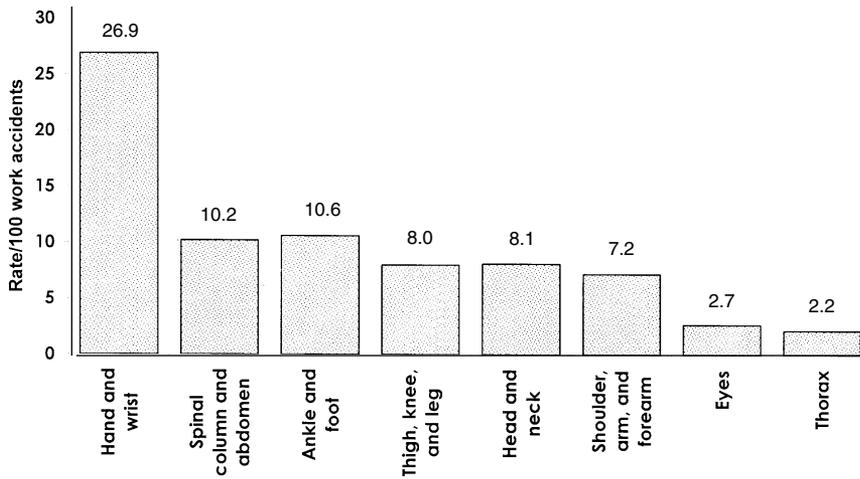


Figure 1—Work accidents by affected anatomic region. Source: IMSS Coordinación de Salud en el Trabajo. Memorias estadísticas 2004.

the workplace to home and are known as in transit accidents (IAs).<sup>4,21</sup> The difference between OAs and IAs is that the latter are not included in the OR insurance-premium determination. In these cases the IMSS absorbs the total expenses generated by the event.<sup>16</sup>

Table 1 shows occupational permanent disabilities (PDs), and deaths due to occupational risks, as well as the disability rates for non-occupational diseases (IRs) during the past 20 years. The annual incidence rate of on-the-job accidents per 100 workers fell from 7.23 to 2.3 and the death rate fell from 1.68 to 0.9 per 10,000 workers, while the rate of occupational diseases for every 1,000 workers increased from 0.6 to 1. This could be interpreted on the one hand as improvement of accident-prevention conditions and on the other as the result of work-risk recognition and registry. Figure 1 shows the anatomic areas affected by occupational accidents, and Figure 2 demonstrates the permanent disability (PDs) corresponding to the affected regions, with accidents and sequelae in hands reported as most prominent.

The main causes of death due to OAs are cranio-cephalic trauma and thoracic and abdominal contu-

sions, the majority from automobile accidents. It is important to point out that while the general death rate related to occupational accidents has decreased (Table 1), the fatality rate has increased; in 1997, 29.9 workers died per 10,000 occupational accidents, a number that increased to 37.8 in 2004.<sup>22</sup>

Figure 3 demonstrates the trends in occupational diseases (ODs) registered most frequently with the IMSS. Hearing loss, chemical bronchitis, and pneumoconiosis, which have increased over the past several years, were found to be the most common. The diverse types of dermatitis, in addition to musculoskeletal injuries due to cumulative trauma, occupy lower frequencies. We estimate that the underreporting of ODs is significantly higher in Mexico than in more developed countries.<sup>23</sup>

Occupational accidents, disabilities and deaths are shown by economic group for the year 2004 in Table 2. Although there has been a decrease in the rates over time, the economic activity groups with the most events continue to be the same as those of ten years ago. The highest rates of occupational accidents are found in the food and beverage preparation and services industries.

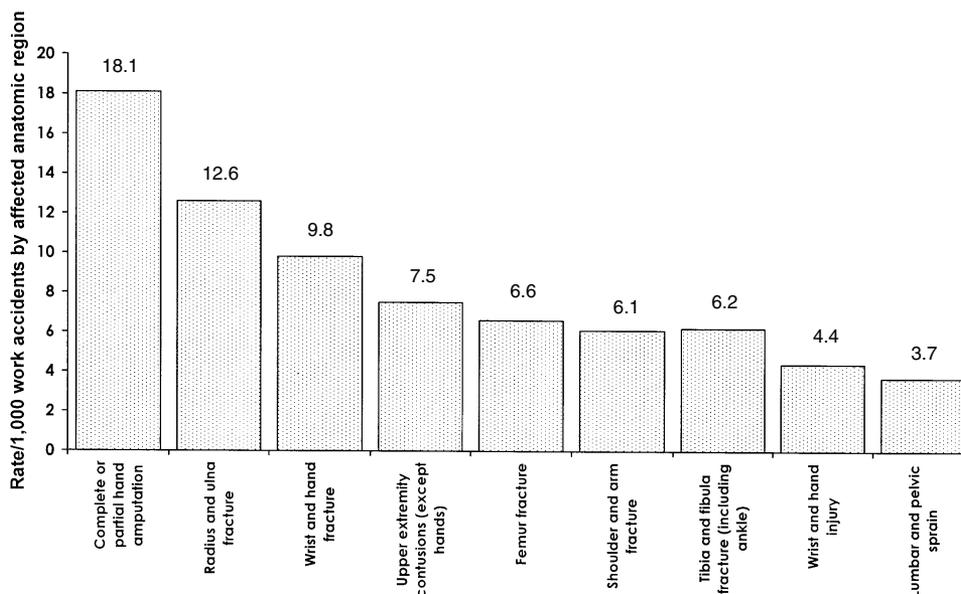
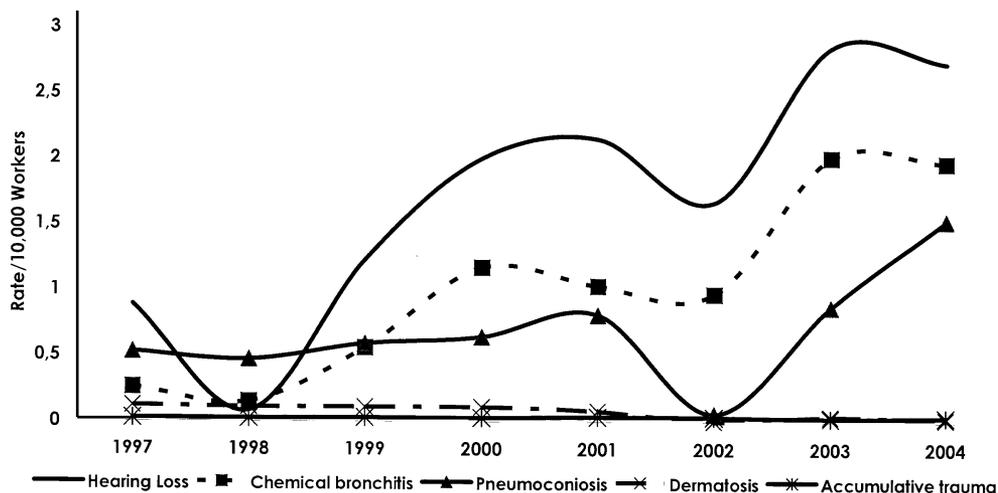


Figure 2—Permanent disability by affected anatomic region. Source: IMSS Coordinación de Salud en el Trabajo. Memorias estadísticas 2004.

Figure 3—Main occupational diseases, 1997–2004. Source: IMSS Coordinación de Salud en el Trabajo. Memorias estadísticas 1997–2004.



The manufacture of metallic products had the highest rate of permanent disabilities, and ground transportation industries had the highest accidental death rate. The construction industry remains among the highest in all three types of events.

Occupational diseases, disabilities and deaths by economic activity sector are shown in Table 3. These data have not changed much over the past decade. The highest rates per event are found in the mining industries, including mining of metallic minerals, mineral

TABLE 2 Economic Activities with the Highest Rates of Occupational Accidents, Permanent Disabilities, and Deaths, 2004

	No. of Workers	Occupational Accidents		Permanent Disabilities		Deaths by Work Accidents	
		Cases	Rate/100 Workers	Cases	Rate/1,000 Workers	Cases	Rate/10,000 Workers
1. Building construction and civil engineering work	753,479	27,489	3.6	1,392	1.8	192	2.5
2. Professional and technical services	1,217,452	18,891	1.6	538	0.4	75	0.6
3. Buying and selling at self-service stores and specialized department stores, by merchandise line	408,963	18,888	3.9	271	0.7	8	0.2
4. Buying and selling of foods, beverages, and tobacco products	520,731	15,145	2.9	377	0.7	63	1.2
5. Food manufacture	494,062	14,770	3.0	797	1.6	45	0.9
6. Public administration and social security services	857,597	13,800	1.6	254	0.3	44	0.5
7. Food and beverage preparation and service	141,313	13,369	9.5	225	1.6	21	1.5
8. Manufacture of metallic products except for machinery and equipment	300,872	12,340	4.1	918	3.1	24	0.8
9. Overland transport	372,142	10,360	2.8	678	1.8	147	4.0
10. Buying and selling of prime matter, materials, and auxiliary	334,918	10,032	3.0	412	1.2	38	1.1
11. Personal services for the home and diverse	394,665	9,160	2.3	278	0.7	20	0.5
12. Manufacture of rubber and plastic products	214,276	6,902	3.2	467	2.2	6	0.3
13. Manufacture and/or assembly of machinery, equipment, apparatuses, and electrical articles, electronic articles, and their parts	391,232	6,565	1.7	338	0.9	3	0.1
14. Buying and selling of clothing articles and other personal use articles	428,787	5,667	1.3	147	0.3	12	0.3
15. Temporary boarding articles	242,894	5,616	2.3	80	0.3	9	0.4
16. Other	5,274,876	96,475	1.8	4,744	0.9	362	0.7
National total	12,348,259	282,469	2.3	11,916	1.0	1,069	0.9

Source: IMSS Coordinación de Salud en el Trabajo. Memoria estadística 2004.

**TABLE 3 Economic Activities with the Highest Rates of Occupational Diseases, Permanent Disabilities, and Deaths Due to Occupational Diseases during 2004**

	No. of Workers	Occupational Diseases		Permanent Disabilities Due to Occupational Diseases		Deaths Due to Occupational Diseases	
		Cases	Rate/10,000 Workers	Cases	Rate/1,000 Workers	Cases	Rate/10,000 Workers
1. Overland transport	372,142	932	25.0	1,197	3.2	0	0
2. Construction, reconstruction, and assembly of transport equipment and its parts	391,232	766	19.6	824	2.1	0	0
3. Textile industry	129,925	531	40.9	605	4.7	0	0
4. Manufacture of rubber and plastic products	214,276	508	23.7	539	2.5	0	0
5. Extraction and benefit of metallic minerals	24,095	483	200.5	544	22.6	0	0.42
6. Basic metallic industries	67,441	462	68.5	658	9.8	0	0
7. Manufacture of metallic products, except for machinery and equipment	376,905	339	11.3	468	1.6	0	0
8. Extraction and benefit of mineral carbon, graphite, and non-metallic minerals, except for salt	34,271	311	90.7	378	11.0	3	0.88
9. Professional and technical services	1,217,452	283	2.3	343	0.3	0	0
10. Constructions and buildings of civil engineering works	753,479	229	3.0	302	0.4	0	0
11. Chemical industry	202,864	227	11.2	259	1.3	0	0
12. Generation, transmission, and distribution of electrical energy	109,485	216	19.7	311	2.8	0	0
13. Manufacture of non-metallic mineral products	129,844	212	16.3	248	1.9	2	0.15
14. Manufacture and/or assembly of machinery, equipment, apparatuses, accessories, electronics and electrical articles and their parts	506,960	173	3.4	166	0.3	0	0
15. Paper industry	81,503	168	20.6	199	2.4	0	0
16. Others	7,812,418	1,578	2.0	1,796	0.2	2	0.002
National total	12,348,259	7,418	6.0	8,837	0.7	8	0.01

Source: IMSS Coordinación de Salud en el Trabajo, Memorias Estadísticas 2004.

carbon, graphite, and non-metallic minerals. Only eight deaths were registered as a consequence of occupational diseases, the majority under the category of mineral-extraction activities.

The disability-pensions rate for non-occupational diseases has diminished from 4.2 to 1.2 per 1,000 insured workers (Table 1) due to legislative changes that restrict access to this line of compensations rather than to improvement in workers' health conditions. Figure 4 shows the main disabling disorders (non-occupational diseases), whose trends have not shown great variation over the past decade. The most frequent are: degenerative articular diseases, complications from diabetes, diverse types of cancer; cerebrovascular disease sequelae, renal insufficiency, cardiopathies, ophthalmopathies, mental diseases, and acquired immunodeficiency syndrome. The progressive increases of cases of cancer and chronic renal insufficiency, for which possible occupational causes have not been discarded, are noteworthy. This type of chronic or

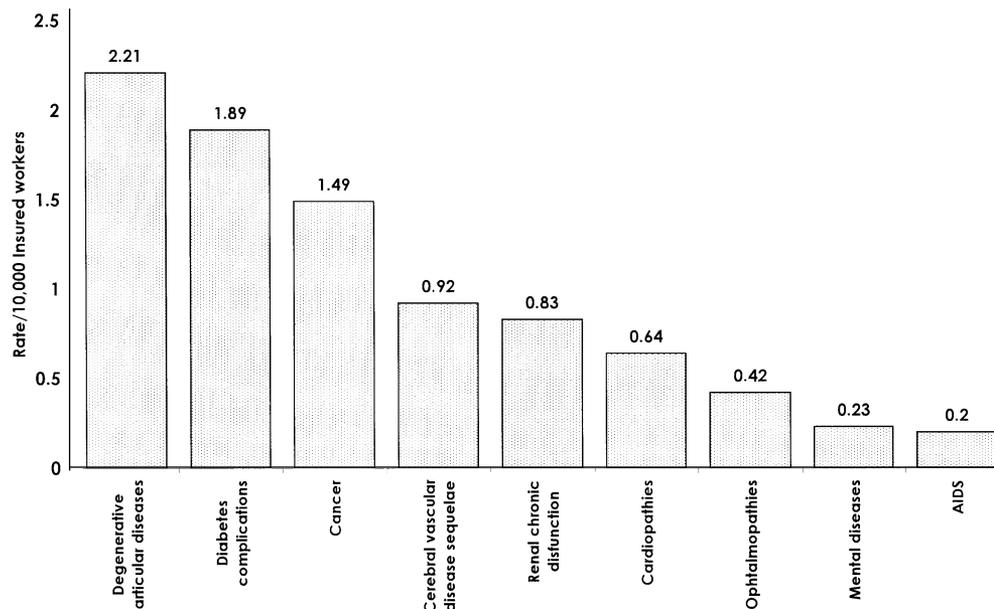
progressive disease under-reporting is due primarily to lack of knowledge of primary care physicians concerning the probable relationships of these diseases to occupational exposures.

## DISCUSSION AND CONCLUSION

In Mexico, workers' health should be a high-priority issue for governmental agendas, in that the social cost of deterioration in the quality of life of the workers and their families is an obstacle to sustainable development of the country. In the face of limited employment opportunities—in part caused by the negative effects of the global economy—the Mexican work force is pushed to emigrate to the informal sectors in Mexican cities and to the United States. Such Mexican workers are relatively uneducated, and lack knowledge of occupational risks and means of protection for health.<sup>24</sup>

Since the 1970s, hazardous industries from developed countries have been concentrated in Mexico.

Figure 4—Main non-occupational diseases causing disabilities. Source: IMSS Coordinación de Salud en el Trabajo. Memorias estadísticas 2004.



These industries often use products that are prohibited in the companies' countries of origin, such as asbestos, arsenic, anilines, butadiene, PVC, benzene, and other agents cataloged as toxic or carcinogenic.<sup>25</sup> In addition to the influx of hazardous industries, we observe the import and export of occupational diseases derived from the exchange of the work force between countries that results from economic globalization. Control and surveillance of such transfers require decisive governmental cooperation to benefit workers who are exposed to hazardous environments and who return in subclinical or manifest-disease stages to their places of origin.<sup>26</sup>

Mexican workers confront new risks, such as psychosocial pressures, intense work burdens, fatigue, and physical wear and tear, in addition to the employment of persons of advanced age and with disabilities, as well as an increase of women in the workplace. All of these issues are only marginally studied in Mexico. In addition, many Mexican workers have low quality-of-life levels that add to the previously mentioned risks, such as the lack of information about prevention. Damage to health resulting from industrialization and risk transference, and the importation of occupational diseases could become greater than corresponding conditions seen in developed countries in previous decades.

The impact of globalization of national economies, the NAFTA framework, and other commercial agreements will continue to challenge occupational health in Mexico. One main challenge comes from integrating the economies of the countries involved, despite their inequality. Protection mechanisms for work, human, economic, social, cultural, and environmental rights should be ensured in such a way that commercial agreements do not debilitate the legal framework or the sovereignty of the states.

Social security institutions in Mexico confront problems derived from the demographic, epidemiologic, and economic transitions that affect the institutions' financial viability. With this situation in mind, proposals that do not contemplate OH services have been set forth for health care reforms.<sup>27</sup> Recently, a public insurance policy has been established with the objective of offering low-cost medical care to the uninsured population, and to reach national coverage in 2010. However, this policy does not contemplate OH services for this population, who could be exposed to hazardous working conditions within the informal economy.

The limited number of specialists trained to care for OH needs, lack of updating of undergraduate and postgraduate academic programs, and poor training methods add to the growing need for professional harmonization at the global level, and render it necessary to carry out actions to strengthen OH in Mexico. Also necessary will be the participation and commitment of the different institutions involved in academic and research development in OH, to define research agendas according to the priority health and quality-of-life problems faced by Mexican workers.<sup>28</sup> To promote norms or regulations that permit the participation of workers and of personnel trained in the diverse areas of OH would result in greater risk control in companies and institutions and an increase in the number of courses and specialized professionals.<sup>29</sup> The lack of information generated by institutions and companies renders national worker-population health registries incomplete, because they take into account only OH reports emitted by the IMSS, principally in urban and industrial areas, in addition to which such information is not integrated into decision making for public health and policy.<sup>30</sup>

IMSS has identified underreporting of 26% of work-related accidents at the national level, probably due to

administrative procedures, lack of worker affiliation on the part of the enterprises, lack of knowledge on the part of the workers, and care for non-severe accidents by assistant medical services contracted by companies.<sup>31</sup> On the other hand, chronic work-related morbidity can be diluted by expulsion of a sick worker before the end of his or her productive life<sup>32</sup> and by underreporting cases of illness due to cancer, cardiovascular, osteomuscular, neurologic, and psychiatric diseases in workers who continue to appear in the social security system, a situation corroborated in a study of the principal causes of mortality in IMSS-insured workers.<sup>33</sup> This study identified cancer as the main cause, with a rate of 33.9/100,000 workers, followed by diabetes mellitus and hypertensive disease complications with rates of 25.2 and 24.9, respectively. Among identified cancer types that are noteworthy due to their possible occupational relationship we find bronchial and lung cancers, leukemias, liver, and encephalus.

International measures need to be established to ensure minimum worker health protection as well as compensation systems. The politics of health and the practice of OH professions in Mexico should be brought up to a standard level of excellence, without losing sight of the international environment. These professionals are capable of confronting the economic, social, and technological transformation associated with development, and the collaboration that would prepare Mexico to confront the challenges of the future with improved quality and professional competitiveness.

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