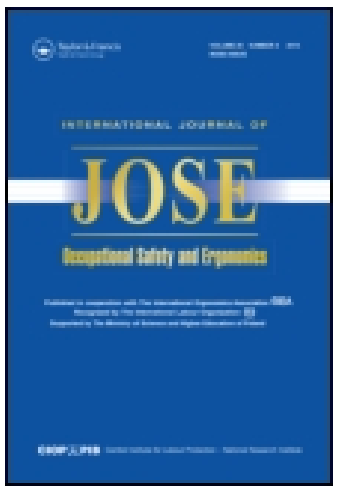

International Journal of Occupational Safety and Ergonomics
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/tose20

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Ruddy Facci[a]
[a] Health at Work International Institute, Curitiba, Brazil
Published online: 08 Jan 2015.

To cite this article: Ruddy Facci (2001) Occupational Health in Brazil, International Journal of Occupational Safety and Ergonomics, 7:4, 493-506

To link to this article: http://dx.doi.org/10.1080/10803548.2001.11076504

INTERNATIONAL JOURNAL OF
OCCUPATIONAL SAFETY AND ERGONOMICS 2001, VOL. 7, NO. 4, 493–506

Occupational Health in Brazil

Ruddy Facci

Health at Work International Institute, Curitiba, Brazil

The author presents a review of the history of occupational health in Brazil, concerning the last 3 centuries. This period was divided into (a) slave labour, (b) immigrant labour, and (c) industrial labour. The author shows the early occupational diseases, pioneering occupational physicians and Brazilian laws on the subject. The creation of Fundacentro (Brazilian Foundation of Occupational Health and Safety) and the foundation of the Brazilian Association on Occupational Medicine (ANAMT) are described as well as their activities. The author concludes the article by showing the importance of the actions of the Ministry of Labour, the Ministry of Health, and the Ministry of Social Security for the development of occupational health in Brazil.

Brazil data historical review occupational medicine occupational health Brazilian occupational physicians occupational health in Brazil

1. HISTORICAL AND GEOGRAPHIC REVIEW

To speak about occupational health in Brazil it is necessary to present a short historical and geographic review.

1.1. Historical Review

From the time Brazil was a colony of Portugal up to the beginning of the 20th century, the workers were slaves. As the Brazilian Indians could not be

Correspondence and requests for reprints should be sent to Ruddy Facci, Health at Work International Institute, Rua XV de novembro, 1425, Curitiba, PR — 80.060-000, Brazil. E-mail: <ruddy@insatnet.com.br>.

enslaved due to their personality, the slave labor was brought from Africa. As industry was almost nonexistent in Brazil, these slaves were sent to the plantations, where they also worked with primitive machines on coffee plantations, sugar cane plantations, and so forth, where, due to the total absence of protection in the machines, there were many work accidents.

Industry progressed slowly and in 1877 there were 30 textile industries and 30 hat factories, with slaves as employees.

This first phase of industrialization was based exclusively on the work of slaves whose owners had the responsibility of dressing, feeding, and housing them. As these slaves were well-trained in industrial activities they became valuable, and, when they got sick, the decrease in performance caused loss to the industries. This was when the slaves started getting medical help, but no thought was given to the possible consequences of the working conditions on the health of those workers.

It was only in the period between 1870 and 1900, after more than 300 years of colonialism, that the Brazilian doctors started to discuss the interrelationship between work and health, with a few theses in the medical schools:

- "of the cigar and snuff factories,"
- "of the candle and soap factories from Rio de Janeiro and the health of their workers and neighbors,"
- "professional intoxication by lead."

The economical crisis of 1875 forced the owners to look for means of making their factories more efficient and less costly. Slaves were still the workers, but the cost of their maintenance was high. The purchasing of a slave trained to work in industry, mainly in the textile industry, implied a high cost for that time, increased by the cost of room and board.

Between 1880 and 1885 the number of industries became 3 to 4 times greater. At this time, several European countries had serious economical and social problems and many of the poor inhabitants emigrated to North and South America in search of a new life.

As the value of a well-trained slave was 2.5 times higher than the cost of a ticket from Europe to Brazil, the factory owners started to hire European immigrants, whose salaries were lower than the cost of maintaining a slave, for they did not have to supply room and board. So, the liberation of the slaves in Brazil in 1888 was, of course, welcomed by the industrial leaders.

In the period between 1889 and 1901, one million European immigrants arrived in Brazil. At this time, 90% of the industrial workers were immigrants and only 10% were ex-slaves.

The working conditions were precarious: The employers established the number of working hours (12 to 14 hrs per day, 60 hrs per week); 33% of the work force were women, but their wages were 30% of the wages of the men; pregnant workers worked until the day of the delivery and several times the deliveries occurred at the working place; minors under 18 worked as adults; tardiness was punished with fines; each visit to the restroom implied a deduction in the salary.

The Brazilian economy in the beginning of the 20th century, based on coffee and sugar, contributed to the development of some pathologies among the workers, such as cholera, plague, and yellow fever. In 1910 the building of the railroad from Madeira to Mamoré in the Amazon jungle, coordinated by the English, showed an epidemic of diseases related to the work environment, malaria and ancylostomosis, causing a high amount of deaths, which gave the railroad the nickname of "the devil's railroad."

However, in 1920, an industrialist named Jorge Street requested a doctor to take care of the general health of his employees, still without any attention to the relationship between work and disease, creating the first medical service in a company hired by the employer. Mr. Street's attitude attracted the attention of other industrialists, who, seeing profit in not having sick employees, started to hire doctors to take care of their employees, starting some company medical services, but still ignoring the relationship between work and disease. The doctors used their free time for this work, treating only the common diseases that caused absences at work. Under intense popular pressure, the Brazilian Congress approved the first Law of Work Accident in 1939. On May 1, 1943, the Law-Decree 5.452 was approved, creating the Consolidation of the Work Laws, whose Chapter V established Hygiene, Occupational Health, and Safety. During this decade the first cases of silicosis appeared, provoked by the work in coal mines. In 1959 the International Labour Office (ILO) published Recommendation 112, advising the companies to create medical services concerned with occupational health, but this recommendation was practically ignored in Brazil. The current occupational health practices in Brazil were born from some important facts:

- 1966—creation by the Ministry of Labour of the Fundacentro (Foundation of Safety and Occupational Health), with the objectives of research and

education in occupational health that organized specialization courses in occupational health and safety, which would be later administered by the medical schools;

- 1968—foundation of ANAMT (National Association on Occupational Health of Brazil), as a scientific entity that congregates occupational doctors, with the objectives of promoting health and avoiding the diseases of the workers and improving the professionals of occupational health technically and scientifically;
- 1972—creation of Decree 3237 of the Ministry of Labour obliging companies to provide services specialized in occupational health and safety;
- 1974—start of the specialization courses in occupational health.

Brazil is a physical continent in a social archipelago, with more than 8.5 m square kilometers, occupying most of South America. The east coast (7,300 km) is bounded by the Atlantic Ocean and, from north to south, the interior borders are with French Guyana, Suriname, Guyana, Venezuela, Colombia, Peru, Bolivia, Paraguay, Argentina, and Uruguay.

Brazil is also a country of huge contrasts in many aspects: social, economic, cultural, technological, and so forth, and these contrasts affect questions connected with workers' health. One very simple example: A nationwide regulation sets limits for temperature conditions acceptable at workplaces. The same limits are valid for workers at an electronic plant in Manaus (the Capital of Amazon) in the north, where it is very hot all year round, and for workers in a textile plant in the south, where it may snow during the winter. Brazil is the only country in South America where Portuguese is spoken; it is a kind of island surrounded by Spanish-speaking countries.

The occupational physicians of Brazil started to group around ANAMT as it spread in the Brazilian states, and today there are almost 3,000 associates, the majority participating in congresses and seminars with the objective of refreshing and updating their knowledge. At each triennial national congress the number of delegates increases.

With more than 30 years of existence, ANAMT lived, followed, and participated in all the developments regarding occupational health in Brazil, cooperating with the Ministry of Labour in the alterations of the legislation, with the universities in the courses of the occupational health field, in research, in the formation of the occupational physicians, and in their continuous education.

1.2. Geographic and Demographic Review

The present population is approximately 170 m (70% living in urban areas), females predominating slightly over males. The age group distribution shows 54% aged less than 25 years and 14% over 50 years. Population parameters vary strongly in different regions (Tables 1–5).

TABLE 1. Distribution of Brazilian Population by Age Groups

Age (years)	%
Up to 14	34.6
15–24	19.4
25–49	32.0
50–69	10.8
>70	3.0
unknown	0.2

TABLE 2. Distribution of Brazilian Population by Geographic Regions

Region	Population Density (inhabitants/km^2)
North	2.6
Northeast	27.2
Southeast	67.7
South	38.3
Center-west	5.9
Whole country	17.8

TABLE 3. Vital Statistical Indicators

Birth rate (births per 1,000 inhabitants)	23.7
Infant death rate (deaths per 1,000 live births)	65.8
North-eastern	88.2
South	26.7
Life expectancy at birth (years)	
Males	70
Females	74

TABLE 4. Schooling

Schooling (years)	Working Population (%)
<1	16.3
1–4	36.4
>8	23.8

Notes. The proportion of illiterates among the general population is 19.6% for people over 15 years old.

TABLE 5. Number of Schools and Universities

Type of School	Number
Primary school	195,840
Secondary school	12,556
Universities	851
Faculty of Medicine[1]	82

Notes. 1—public and private.

1.3. Economic Indicators

The economically active population is 73 m (45.6% of the total population), with 35.5% female, working in industries (28.4%), commerce and services (58.6%), and agriculture (13%). The minimum age for working is 16.

The distribution of the economically active by category shows employees—63.7%, independents—32.7%, employers—4.6%.

The strong difference in income distribution may be summarized as follows: 25.0% of the population earned up to the minimum wage (US$ 120 per month) and 7.8% earned ten times the minimum wage.

The Gross Domestic Product (GDP) is US$ 500 bn, composed of industry (36.3%), agriculture (13.2%), services (52.1%), and others.

2. TEACHING OCCUPATIONAL HEALTH IN BRAZIL

Formal education in occupational health is basically achieved through specialization courses for technicians and university graduates, and at graduate and postgraduate levels in schools and universities.

2.1. Graduate Courses

Since 1962, a class in occupational medicine is part of the minimum required curriculum at medical schools in Brazil. During the 1970s, with the official requirement for specialized occupational health services in enterprises, other graduate courses began to include disciplines connected with workers' health. Therefore, this subject was included in the curriculum of phonoaudiology, psychology, social services, sociology, production, and engineering.

In spite of the legal obligation in the field of medicine, only 26 out of the 82 medical schools confirmed that a program was effectively incorporated and described its content. In schools where the program is better organized, 80-hr courses are scheduled for students in the sixth or seventh semester. In these modules, lectures about prevalent occupational diseases are included along with accidents, evaluation of the working environment, institutions connected with workers' health, pertinent legislation, and safety insurance. These courses also include interviews with workers affected by occupational diseases and accidents, and visits to factories.

2.2. Specialization Courses

According to Brazilian law, since 1972 it has been compulsory for enterprises to employ occupational physicians, safety engineers, safety inspectors, occupational nurses, and occupational nursing auxiliaries, depending on the number of workers and the degree of risk by which the plant is classified. This law stimulated the demand for specific courses. At the technical level, courses for safety inspectors and occupational nursing auxiliaries were created, as were courses for occupational physicians, safety engineers, and occupational nurses.

2.2.1. Specialization courses for occupational nursing auxiliaries

The prerequisite for entrance to this course is a regular nursing course (a technical course leading to what is called a first degree in the nursing career). These courses have a duration of 240 hrs, of which 180 consist of theory and 60 hrs of practice in the health service of an enterprise.

2.2.2. Safety inspectors

The prerequisites for the safety inspectors' course are a minimum age of 18 years, and completion of secondary degree schooling. The courses have a duration of 1,300 hrs, including 450 hrs of daytime training in plants where services in safety engineering are in operation.

2.3. Postgraduate Level Courses

2.3.1. Specialization courses in occupational medicine

The prerequisite is an MD degree. These courses last about 700 hrs, of which 75% of the schedule is theory, 25% is practice at plants, focusing on hygiene and safety, environmental control, and medical control. At the end of the course, students are required to submit an individual monograph on a relevant subject of their own choice. After the degree, the title is Occupational Doctor. According to the medical schools, 20,000 doctors have finished these courses. It does not mean that Brazil has 20,000 occupational physicians working with workers' health, because most of them have stopped their practice. Nowadays, only 4,000–5,000 occupational doctors are working full-time with workers' health.

The awarding of the title of Specialist in Occupational Medicine is a prerogative of ANAMT and is done through a test of knowledge and curriculum, for physicians, after completion of a postgraduate course with 2 more years of practicing occupational health.

Every year ANAMT conducts a national test, and the pass rate is 40–50% of the participants. The title for doctors approved in this test is Specialist in Occupational Health. Brazil has only 1,000 specialists in occupational health.

2.3.2. Residency in occupational medicine

The residential program in occupational medicine lasts from 1 to 3 years. It is organized with lectures and appropriate studies for at least 240 hrs a year. Additionally, 1,200 hrs of practice must be accomplished, including training in outpatient and hospital occupational health services, and in-plant medical services. A residency in occupational health is not a common first choice for recent graduated physicians. Only four faculties of medicine offer a residency in occupational health, with a small staff: 8 full professors, 19 holders of a master's degree, 7 holders of a doctor's degree.

2.3.3. Specialization courses for occupational health nurses

The prerequisite is a certificate from a graduate course in nursing at the university level. The duration is 600 hrs, including 436 hrs of theory and 164 hrs of practical training in occupational health services. Students are required to submit an individual monograph at the end of the course.

2.3.4. Specialization courses for safety engineers

The prerequisite is a degree in engineering, architecture, or agronomy. These courses include about 700 hrs of lecture.

2.3.5. Master's and doctor's degrees

A limited number of universities offer higher university degrees in occupational health for physicians and other health professionals. Generally, these programs are offered in schools of public health.

3. THE PRACTICE OF OCCUPATIONAL HEALTH

3.1. The Practice of Occupational Health in Enterprises

In 1972 occupational medicine services in companies were made compulsory and ever since there have been large differences in its standards of practice. Large enterprises were obliged to hire occupational doctors in order to provide the services required by law, but for the small and medium enterprises there was no such requirement. Inequalities in the practice of occupational medicine in the country became apparent over time.

In 1994 the Ministry of Labour demanded by law a more elaborate control of occupational medicine for all enterprises. The former requirements for large enterprises to contract professionals was maintained, but the small and medium ones were also obliged to have a responsible physician for the development and implementation of a program of occupational health, shaped for the specific hazards of each contractor. This physician may or may not be connected to the contractors, and should implement preventive measures and provide regular medical screening for the workers of these enterprises.

Table 6 presents the percentage of enterprises in Brazil categorized by the number of employees.

TABLE 6. Enterprises in Brazil Categorized by the Number of Employees

Number of Employees	Enterprises (%)
>500	1
100–499	6
10–99	44
1–9	49

3.2. Public Health and Occupational Health

Until the 1980s the Public Health Services had no responsibility for occupational health. There was an historical understanding that this area was only related to the Ministry of Labour. From the mid-1980s, groups of health professionals slowly began to be concerned and created reference centers for workers' health (CRSTs), linked to primary care units of the local authorities (municipality and state). The initial function of the CRSTs was the diagnosis and treatment of occupational diseases and surveillance of accidents and occupational diseases. The creation of CRSTs had a great impact on the recording of occupational diseases, which rose from 3,000 cases in 1985 to 15,000 in 1991, and 22,000 in 1997.

At present, these centers are officially recognized but exist only in the more industrialized and wealthy regions of Brazil (south and southeast); others, only in some of the state capitals. The CRSTs are administered by a mixed body of representatives, including union representatives (indicated by the local union areas).

3.3. Private Health Services and Occupational Health

Private health services care groups never had an important role in the field of occupational health. Only recently, by force of the new legislation, have these groups started to show an interest, some of them having already created specific departments to render these services. This applies particularly to medium and small enterprises that are not legally obliged to have occupational health services at the workplace.

3.4. Private Consultancy in Occupational Health

This is a new job for occupational physicians. In general, occupational doctors, after working for large enterprises for many years, have the opportunity to create their own company in order to attend to small and medium enterprises.

3.5. Workers' Organizations and Occupational Health

In 1979 the Inter-Union Department for the Study of Health and the Working Place Environment (DIESAT) was created, with the aim of giving technical, political, and legal assistance in the field of occupational health to the associate trade unions. The unions have active participation in the tripartite group directed by the Ministry of Labour; the other two are the employers' federation and the Secretariat of Occupational Health and Safety, on behalf of the Ministry of Labour.

3.6. Employers' Organizations and Occupational Health

Employers' organizations have had an important influence on occupational medicine in Brazil. In 1957 the industries' federation opened the first specialized outpatient clinic for occupational diseases in Brazil in Sao Paulo City. The employers have also had, since the 1960s, an association for prevention of accidents (ABPA), with the aim of giving information and courses to member industries (Table 7).

TABLE 7. Work Accidents in Brazil in the Year 2000

	Work Accidents						
Region	**Total**	**(%)**	**PD**	**TI (%)**	**PI (%)**	**RW (%)**	**D (%)**
Whole country	403,532	100	17.8	81.6	3.7	13.7	1.0
North	6,156	1.5	2.6	78.7	6.8	11.3	3.2
Northeast	26,462	6.5	27.2	78.0	7.5	12.3	2.2
Southeast	267,825	66.4	67.7	81.2	3.4	14.2	0.7
South	88,630	22.0	38.3	82.0	2.8	14.4	0.8
Center-west	14,459	3.6	5.9	85.7	6.8	4.7	2.8

Notes. PD—population density (inhabitants/km^2), TI—temporary incapacity, PI—permanent incapacity, RW—return to work, D—death.

4. HOW THE LEGISLATION IS ENACTED

4.1. Ministry of Labour

The Brazilian legislation gives to the Ministry of Labour the authority to standardize and enforce prevention of accidents and occupational diseases. For this task the Ministry has a standard-setting unit, the Secretariat of Safety and Health at Work (SSST), and for each state a Regional Office of Labour (DRT), which has a technical staff for worksite inspections.

The Secretariat develops the technical framework assisted by an institution specialized in occupational health research, Fundacentro, which also helps the DRTs. The standards cover many aspects involving both urban and rural workers, for example,

- establishment of joint occupational safety and health committees;
- requirement for in-plant occupational health services in large enterprises;
- establishment of threshold limit values (TLVs) for many chemical products;
- requirement for medical controls for workers and special control for workers exposed to specific risks (chemical substance, ionizing radiation, hyperbaric pressure, etc.);
- establishment of standards for the sale and use of personal protective equipment, handling of pressure vessels, and safety in construction work;
- requirement of a program for prevention of occupational hazards in enterprises.

In recent years, tripartite agreements about specific subjects have been reached between representatives of contractors, workers and the Ministry of Labour, with the assistance of Fundacentro.

4.2. Ministry of Health

The Ministry of Health is responsible for disease prevention and medical care through a unified health system (SUS). This ministry has very little tradition in preventive action related to work hazards since this has been the responsibility of the Ministry of Labour for over five decades.

The new 1988 Brazilian Constitution gave to the Ministry of Health joint responsibilities in the field of occupational health. Medical care for workers suffering injury at work and occupational diseases (except rehabilitation) is solely the responsibility of the SUS. Also, the SUS, through local

CRSTs, may take part in worksite inspections as a component of their surveillance program. Recently SUS units (basically the CRSTs) have been acting with public prosecutors in questions of public right that may determine changes in working conditions and compensation for injured workers.

4.3. Ministry of Social Security

Payment of compensation and other benefits, including rehabilitation, is the sole responsibility of the State through the National Institute of Social Security (INSS). The ministry enacts legislation concerning evaluation of occupational accidents and diseases for compensation purposes.

In Brazil, occupational diseases and accidents at work are equivalent from the legal standpoint and legislation concerning such cases is not restrictive. Apart from traditional occupational diseases and repetitive strain disorders, any disease that is proven to be connected with work is liable for compensation. Until 1972 the INSS was in charge of payment for work absence from occupational accidents and diseases, but since then the enterprises have been responsible for the first 15 days of absence. This modification discouraged notification of accidents and diseases.

5. OCCUPATIONAL HEALTH AT PRESENT

Occupational physicians in Brazil have many opportunities for training and refreshing knowledge.

- Every year, in every State, there is a local seminar supported and coordinated by ANAMT.
- Every 2 years, there is a regional seminar (geographic distribution) supported and coordinated by ANAMT.
- Every 3 years there is an ANAMT national congress.
- Every 2 years there is a Latin-American Congress on Occupational Health, in different countries.
- Every 3 years there is an Ibero-American Congress on Occupational Health, for countries Spanish- and Portuguese-speaking countries.
- Every 3 years there is an International Commission on Occupational Health (ICOH) Congress.

Occupational health is a fairly new field in Brazil, partly because large-scale industrialization is recent. Although occupational health as a whole is far from ideal, occupational-related accidents have been decreasing in the past 25 years, in contrast with occupational diseases and mortality (Table 8).

TABLE 8. Dvelopment of Occupational Accidents, Diseases, and Deaths From 1970 to 1990

Year	Accidents	Occupational Diseases	Deaths
1970	1,220,111	—	2,232
1980	1,464,211	3,800	4,824
1990	693,572	5,218	5,355

Until recently, the Ministry of Labour was in charge of setting standards, inspecting worksites, and conducting programs on education, technical assistance, and applied research in occupational health. Gradually, the Ministry of Health and the Ministry of Social Welfare have become involved and effectively participate in different aspects of occupational health. There are clear indications that in the near future these three areas will work closely together.

Therefore, this report is to be considered only as a result of general considerations, and no more than a starting point to formulate reasonable research hypotheses in view of more detailed investigations.

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