

## Working conditions of Chagas' disease patients in a large Brazilian city

Situação trabalhista do portador de doença de Chagas crônica, em um grande centro urbano

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**Abstract** *This study evaluated the working conditions of Chagas' disease patients in the city of Campinas, São Paulo, focusing on two-hundred-fifty patients with steady employment and treated at the University Hospital (HC-FCM/Unicamp): 98% were working-age and 77.6% were men. The origin of the patients reflected the migratory process occurring among this population. Most of the patients had limited professional skills, while 63.6% had not finished primary school and 21.6% were illiterate. However, 63.6% were regularly employed under duly processed work contracts. Their jobs were mainly in general services (21.6%) and heavy industry (21.2%). Some 55% of the patients reported a monthly income less than or equal to US\$100.00, and 40.4% reported having been fired at least once during the last ten years, in 8.9% of the cases because of a diagnosis of Chagas' disease. Of the patients undergoing pre-hiring physical examinations (57.2%), 9.1% were refused, 92.3% of whom due to positive serology for *T. cruzi*. Finally, 78.4% reported not belonging to a labor union. The study demonstrated the precarious working conditions and discrimination experienced by workers with Chagas' disease.*

**Key words** *Chagas Disease; Trypanosoma cruzi; Urban Health; Workers*

**Resumo** *Este estudo avaliou a situação trabalhista dos chagásicos em Campinas (SP) e região. Entrevistaram-se 250 pacientes com vínculo trabalhista, acompanhados no HC-FCM/Unicamp: 98% integravam a faixa da população economicamente ativa e 76% eram homens. Sua origem confirmou o processo migratório vivido pelos mesmos. A maioria tinha pouca qualificação profissional, com 69,2% dos indivíduos com primeiro grau incompleto e 21,6% analfabetos. Porém, 63,6% estavam empregados com vínculo empregatício regulamentado, concentrando-se principalmente na prestação de serviços (21,6%) e indústria de transformação (21,2%). Dos entrevistados, 55,2% referiram receber até dois salários mínimos, e 40,4% afirmaram ter sido demitidos ao menos uma vez em dez anos, demissão associada ao diagnóstico da doença por 8,9% desses. Também dos 57,2% submetidos a exames admissionais, 9,1% foram recusados, 92,3% dos quais pela soropositividade. Quanto à participação em sindicatos, 78,4% negaram. Evidenciou-se a situação precária e a discriminação contra o trabalhador chagásico.*

**Palavras-chave** *Doença de Chagas; Trypanosoma cruzi; Saúde Urbana; Trabalhadores*

## Introduction

Most of the initial studies on prevalence of Chagas' disease in Brazil were carried out in endemic areas. Studies on the prevalence of *Trypanosoma cruzi* infection in urban areas are more recent: Goldbaum (1976) detected a prevalence of 4.9% in a population of migrants living in São Paulo, and Litvoc (1977) estimated a prevalence of 7.7% among migrants in the municipality of São Paulo. However, on the basis of a nationwide serological survey from 1975 to 1981, prevalence of *T. cruzi* infection for Brazil as a whole has been estimated at about 4.2% (Camargo et al., 1984).

In the municipality of Campinas, São Paulo State, a prevalence of 2% positive serology for *T. cruzi* was detected in 1988 among blood donors (D. San Martini, M. V. F. Camilo, L. L. Takahashi, personal communication). On the basis of this result, the number of Chagas' disease patients in the municipality and surrounding area, including approximately 2 million inhabitants, is estimated at 40 thousand, 10 thousand of whom are assumed to be workers, since 25% of the local population is actively engaged in the labor market (FIBGE, 1992).

Based on the large number of individuals with *T. cruzi* infection in a non-endemic area and occupational health considerations for workers with chronic Chagas' disease (Coura, 1966; Porto, 1974; Cançado, 1987; Luquetti & Porto, 1997), especially in the secondary and tertiary sectors of the economy which predominate in the city of Campinas and the surrounding area (NEPP, 1987), the goals of this study were to evaluate the conditions of workers with chronic Chagas' disease and identify potential discrimination associated with positive serology.

## Methodology

The research used a survey of 250 cases, with the population of patients infected by *T. cruzi* being restricted to the Chagas' Disease Outpatient Service (GEDoCh) of the University Hospital under the School of Medical Sciences, State University of Campinas, the only service in the municipality providing specific care for Chagas' disease patients regardless of the clinical form or stage of the disease. Each individual diagnosis was confirmed by two or more serological tests with positive results. All interviewees were informed about the research protocol before enrolling in the study, performed under guidelines established by the Declara-

tion of Helsinki (British Medical Association, 1964).

The inclusion criterion for Chagas' disease patients in the study was their work relationship, i.e., individuals whose present or past occupation was related to the formal or informal labor market. Thus, minors, housewives, and students were excluded from the study.

The instrument used for the study was a coded questionnaire requesting the following data: age bracket, sex, place of birth, schooling, mode of participation in the work market, area of work, salary, number of and reasons for dismissals over the last ten years, attitude towards dismissal, pre-hiring physical examination, refusal and reason for refusal after pre-hiring physical, and trade union membership.

*T. cruzi*-infected/Chagas' disease workers were clinically classified as follows: 1) indeterminate form (IF), or individuals with no abnormal findings in the physical examination, chest x-rays, electrocardiogram, or esophageal and colonic x-rays and 2) individuals with manifestations of Chagas' disease (CD). The results from IF and CD were compared for all data with the aid of  $\chi^2$  test ( $p < 0.05$ ).

Data on the socioeconomic development of the municipality of Campinas were supplied by the Municipal Planning and Coordination Secretariat (Seplan) and the Institute of Economics at the State University of Campinas.

## Results

The 250 workers enrolled in the study were classified as follows: 143 in the IF group (57.1%) and 107 in the CD group (42.9%).

The majority of the workers interviewed (210, or 84%) were in the 31-to-60-year age bracket (120 or 54.2% in the IF group and 90 or 42.8% in the CD group), followed by the 18-to-29 year bracket (21 workers, or 9%), 16 or 78.2% in the IF group and 5 or 21.8% in the CD group. Only 19 individuals (7%) were over 60 years of age: seven (38.8%) in the IF group and 12 (61.2%) in the CD group. Age distribution was statistically significant. As for sex distribution, 76% were males (190 individuals), with 116 (61.1%) in the IF group and 74 (38.9%) in the CD group. Of the female workers, 27 (45%) were in the IF group and 33 (55%) in the CD group. Sex distribution was also statistically significant.

Some 85 individuals (34.5%) reported coming from the interior of the State of São Paulo: 48 (58.5%) in the IF group and 37 (41.5%) in the CD group. Another 96 (38.2%) were from the

State of Minas Gerais: 53 (52.2%) classified in the IF group and 43 (47.8%) in the CD group. Other locations were reported by 27.3% of the interviewees, with no difference in distribution of clinical presentation.

As for educational level, 69% of the interviewees or 174 patients (106 IF, or 61.6%; 66 CD, or 38.4%) stated having an incomplete primary education (the first eight years of school), while 11 individuals or 5% (8 IF, 72.8%; 3 CD, 27.3%) had completed primary school. The group immediately following consisted of illiterates (54, or 22%): 22 (40.7%) in the IF group and 32 (59.3%) in the CD group. Only 5 (2%) of the Chagas' disease workers reported having received a complete or incomplete high school education: 4 IF, 80%; 1 CD, 20%. The remaining levels were reported by 6 patients: 2 IF, 33.3%; 4 CD, 66.7%. Level of schooling was statistically significant for the two clinical forms.

In terms of occupation or participation in the economy (Table 1), 175 individuals (70%), including 117 IF (66.8%) and 58 CD (33.2%), stated that they were regularly employed, followed by 36 patients (14.4%) who had retired due to disability or were on sick pay. Most of the interviewees (53 individuals, or 21.2%) worked in the services sector: 27 IF (50.9%) and 26 CD (49.1%), followed by heavy industry (53 individuals, or 21.2%): 36 IF (64.9%) and 17 CD (35.1%), agriculture (49 patients, or 19.6%): 21 IF (42.8%) and 28 CD (57.2%), construction industry (31 patients, or 12.4%): 20 IF (64.5%) and 11 CD (35.5%), and others: commerce, public administration, social communications, and transportation (64 patients, or 25.6%), with 39 IF (80.9%) and 25 CD (19.1%).

As for wages, (Table 2), 137 or 54.8% of the workers (61 IF, 44.5%; 76 CD, 55.5%) earned up to US\$ 224.00 per month, while only 14, or 5.6% (8 IF, 57.1%; 6 CD, 42.9%) earned over US\$ 672.00 per month. The data were statistically significant in comparing the two different clinical presentations for workers earning up to US\$ 112.00 per month and US\$ 336.00-672.00 per month. Three patients did not know how much they earned.

Evaluation of the number of dismissals (Table 3) per worker over the last 10 years showed that 149 patients or 59.6% (85 IF, 57.1%; 64 CD, 42.9%) were stable on the job as opposed to 101 workers or 40.4% (58 IF, 57.4%; 43 CD, 42.6%) who had been fired at least once, with a predominance of dismissals with no justification (54 individuals, or 53.5%). Evaluation of the workers' attitudes towards dismissals showed that 80 patients (79.2%) had taken no

Table 1

Mode of participation in the labor economy and work area.

	IF (%)	CD (%)
<b>Occupation</b>		
Employer with own income	01 (100.0)	0
Retired based on total employment time	01 (33.3)	02 (66.7)
Retired, but still active in economy	0	04 (100.0)
Self-employed, without social security	04 (57.2)	03 (42.8)
Unemployed	03 (37.5)	05 (62.5)
On sick pay	03 (30.0)	07 (70.0)
Self-employed with social security	07 (50.0)	07 (50.0)
Retired due to disability	08 (30.8)	18 (69.2)*
Employed with full benefits	109 (68.1)	51 (31.9)#
Employed without full benefits	07 (41.2)	10 (58.8)
<b>Work Area</b>		
Construction industry	20 (64.5)	11 (35.5)
Agriculture	21 (42.8)	28 (57.2)
Processing industry	36 (64.9)	17 (35.1)
Service-oriented work	27 (50.9)	26 (49.1)
Others	39 (80.9)	25 (19.1)

\* p = 0.018

# p = 0.035

Table 2

Salary.

Minimum Wage	IF (%)	CD (%)
< 1	05 (20.8)	19 (79.2)
1-2	56 (49.5)	57 (50.5)
3-6	72 (75)	24 (25.0)#
> 6	08 (57.1)	06 (42.9)
Unknown	02 (66.7)	01 (33.3)

\* p = 0.001

# p = 0.003

measures to challenge the dismissal, while only 16 (15.8%) reported have turned to the trade union for redress.

Pre-hiring physicals had been given to 143 individuals (57.2%): 89 IF, or 62.2%, and 54 CD, or 37.8%, as opposed to 107 individuals (42.8%) who had not received a physical: 54 IF, or 50.5%, and 53 CD, or 49.5%. Of the 13 individuals (7 IF, 53.9%; 6 CD, 46.1%) who were refused (9.1% of those who reported having had a pre-hiring physical), 92.3% attributed this refusal to positive serology for *T. cruzi* infection (Table 4).

Table 3

Number and causes of dismissals in last ten years.

	IF (%)	CD (%)
<b>Number</b>		
0	85 (54.1)	64 (45.9)
1-2	46 (54.8)	38 (45.2)
1-2	12 (70.6)	05 (29.4)
<b>Cause</b>		
Illness	04 (44.4)	05 (55.6)
Bankruptcy	08 (72.8)	03 (27.2)
Just cause	0	01 (100.0)
No justification	32 (59.2)	22 (40.8)
Termination of contract	14 (56.0)	11 (44.0)
Others	0	01 (100.0)

Table 4

Refusal and reason for refusal after pre-hiring physical examination.

	IF (%)	CD (%)
<b>Number</b>		
none	136 (57.4)	101 (42.6)
1	07 (63.6)	04 (36.4)
2	0	01 (100.0)
> 2	0	01 (100.0)
<b>Reason</b>		
Chagas' disease	06 (50.0)	06 (50.0)
Other diseases	01 (100.0)	0

Finally, only 13.6% of the workers reported belonging to a trade union, as opposed to 78.4% who did not participate in any such labor organization.

## Discussion

The social dimensions of Chagas' disease in the Brazilian historical context suggest that predatory settlement of the country generated both irrational exploitation of resources and continuous and progressive deforestation, thus causing ecological imbalance and shifting Chagas' disease vectors from their wild habitats, with the resulting infestation of triatomines in and around human dwellings. This form of colonization involved the construction of "wattle" houses in rural areas. Such dwellings foster

domiciliation of triatomines, thus facilitating the natural transmission of Chagas' disease (Barreto, 1979; Briceño-León, 1990).

In addition, in the industrially-based Brazilian development model, especially in the Southeast, an intensive migratory process has involved large portions of the underprivileged population in the search for better living and working conditions, including individuals from endemic areas for *T. cruzi* infection. According to Dias & Dias (1979), there is a trend towards "urbanization" of Chagas' disease as a consequence of the country's economic model, with a concentration of migrants on the outskirts of large cities. This gives rise to the social problem of a large number of Chagas' disease patients who have left the poorer rural areas for the cities and established a well-defined social situation by joining the capitalist production system (Goldbaum, 1976, 1981; Marins, 1985; Zicker, 1985; Cançado, 1987; Luquetti & Porto, 1997).

Because of the disease's pathophysiological characteristics, especially cardiac involvement (Laranja et al., 1956; Andrade & Andrade, 1979), individuals with Chagas' disease may face exclusion from the labor market during the hiring process, lack of adaptation to professional activities, and summary dismissal, since Brazilian law allows for dismissal with no prior justification (Brasil, 1981). Subsequent formal proof of such dismissals thus becomes difficult. Although the literature suggests the disease's dire psychosocial impact (Dias & Dias, 1979; Petana, 1980; Storino & Milei, 1986), little information is available concerning possible on-the-job discrimination against chronic Chagas' disease patients.

In the current study we interviewed 250 Chagas' disease patients with steady work and found age to be a social indicator for analysis of *T. cruzi*-infected workers. Most of the workers were in their productive years. It should be pointed out that only 2% of the interviewees did not belong to the economically active population which, according to the Brazilian Institute of Geography and Statistics (FIBGE, 1985), includes the 15-65-year bracket. Seventy-six percent of the individuals interviewed were males, a concentration justified by the design of the investigation which excluded individuals without a well-defined work relationship, a situation much more frequent among women. There were proportionally more individuals classified in the indeterminate form of Chagas' disease among men as compared to women. This probably reflected male workers' earlier diagnosis and easier access to a reference clin-

ic for Chagas' disease because of their participation in the production process (Orosz et al., 1996).

The origin of the workers interviewed confirmed the marked migratory process experienced by this population, as well as the direction of this flow towards Campinas and the surrounding region from areas endemic for Chagas' disease. In addition, the low educational level of the sample population allowed us to infer the low professional skills of these individuals, a fact that certainly contributed to their poor wages and unstable work situation. Less education was associated with more severe cardiac damage from *T. cruzi* infection, a result that highlights the precarious conditions of workers with Chagas' disease.

From a social perspective, another characteristic of this population is its mode of participation in the economy. When occupation was surveyed in the present study (Table 1), a high percentage of workers were found to belong to the formal labor market, a fact probably due in part to pressure by representative organizations (unions) which are quite active in Campinas and the surrounding region. However, the cardiac form of the disease was most common in workers with Chagas' disease who had unstable work.

Distribution of the work force was associated with the region's development-centered profile, still maintaining an important link to the rural area because of food production.

Wages are an indicator of life style for the study sample. The reference used here was the minimum monthly wage. Some 45.6% of interviewees reported earning one to two times the monthly minimum wage, and a full 9.6% reported earning less than one minimum monthly wage. In the last group (< 1 minimum wage), the majority of workers with Chagas' disease, or 79.2% of the individuals in this category, had the cardiac form of the disease (Table 2), indicating that worse living conditions were associated with higher morbidity. Considering that purchasing power of Brazilian wages has decreased considerably over the last decade (NEPP, 1987), one can easily infer Chagas' disease workers' level of impoverishment and the related disastrous social consequences.

With regard to job stability (Table 3), 40.4% of the workers had been fired at least once in ten years. No difference was observed between workers with IF and CD. Causes of firing were described as dismissal with no justification, a strategy that may "disguise" possible worker discrimination linked to the individual having Chagas' disease. A full 8.9% of the workers re-

ported having been fired explicitly because of their disease. Following dismissal, most of the workers (80, or 79.2%) reported having made no claims to redress for breach of their labor contract. The interviewees expressed misgivings and lack of information about how to appeal or exercise their rights. Only 16 (15.8%) had contacted the union, and four (4%) had contacted the Regional Labor Office.

Of those undergoing pre-hiring physicals, 9.1% were refused for the job, and 92.3% of these refusals were due to positive serology for *T. cruzi*, confirming the suspected discriminatory attitude in the hiring process, not associated with the clinical presentation of the disease (Table 4). The study also addressed participation in some type of labor union; 78.4% of the workers with Chagas' disease reported not belonging to a union, implying absence of worker defense and strategies to guarantee labor rights.

## Conclusions

The results of this study on individuals with *T. cruzi* infection in a large Brazilian city indicate discrimination against people with Chagas' disease in the labor market. There was a high rejection rate associated with positive serology for *T. cruzi* among job candidates refused after pre-hiring physicals. Serological diagnosis of the disease was also reported as a justification for dismissal, regardless of the workers' clinical condition.

We also observed possible "cover-up" of dismissals without just cause. The precarious labor situation of patients with *T. cruzi* infection was confirmed, particularly for those with more severe clinical evidence of Chagas' disease. Most of the workers are from economically depressed areas with a deficient social infrastructure and have limited schooling and thus low professional skills, earning low wages and experiencing job instability, thus leaving them prone to job discrimination and dismissal on the basis of their positive serological status.

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