



Association between Sociodemographic, Health and Work conditions in Waste pickers in Cartagena de indias (Colombian Caribbean)

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Abstract : The sociodemographic, work and health conditions of 126 unionized recyclers from 4 cooperatives were described, establishing associations through the Chi-Square test. Many of the recyclers do not have all the basic public services, they are of low academic status and are generally the main household support. In health conditions, external risks are observed such as obesity, consumption of liquor and cigarette; They also do not have the habit of paying for medical insurance and labor risks. In working conditions there is exposure to health, biological, food, heavy objects and inadequate protection.

Keywords : Recycling, Waste, Occupational risk, Environmental health, Public health.

Introduction

Health and work are multiple and complex processes, linked and influenced among themselves. The work even in adverse conditions is a mechanism that allows the development of various skills of the human being, so that we can always affirm the existence of a positive pole of work, generator of well-being, in short, health^{1,2}. Health conditions are the set of objective and subjective variables of physiological and sociocultural order that determine or condition the sociodemographic profile and morbidity and mortality of the working population^{3,4}.

The identification of the determinants that affect living conditions in vulnerable groups such as recyclers and their families, allows the generation of strategies that respond to their immediate problems; both from health services, as well as from social and economic policies^{5,6}. The work of people has always been influenced by the conditions in which it carries out its activities, you can find environmental, time and social. The environmental conditions are the physical circumstances in which the employee is obliged to experiment when doing his job depending on the position he occupies in the organization^{7,8}.

The factors of physical risks are associated with the work environment, can be found, temperature, ionizing and non-ionizing radiation, noise and lighting; After these physical factors of risks at work, there are forms of energy, aggressive energy elements present in the environment and generated by specific sources⁹.

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Occupational health presents statistics of important consideration worldwide; approximately 2.2 million deaths are related to work, 270 million people are injured and 160 million people get sick due to work causes; likewise at an economic level, the costs due to accidents at work, occupational diseases, compensations, days of work lost, interruptions in production, medical expenses and others, constitute approximately 4% of the global Gross Domestic Product¹⁰.

In the case of recyclers the problem is even more acute, since their work exposes them directly to different risk factors that workers from other areas do not present and their economic income does not allow them to acquire the necessary equipment for their protection and in turn, they do not have a formal education that allows them to become aware of all the risks to which they are subject^{11,12,13}. Even though many of them are unionized, it requires a greater strengthening in training so that they carry out their work in a less empirical way and can formalize their work in order to increase their productive capacity and, therefore, their income, since their economic activity is of vital importance and contributes to the reduction of waste in the streets¹⁴, which is a major environmental problem in the Caribbean cities of Colombia.

In order to strengthen the working and health conditions of waste pickers, it is necessary to identify the main problems with which they find themselves; authors such as Gómez et al¹⁵, Bedoya et al¹⁶ and Gómez et al¹⁷, have studied social, health and labor conditions in informal workers, but there are few findings in waste pickers in the Colombian Caribbean. Therefore, the following study shows the sociodemographic, health and labor characterization of unionized recyclers in the Colombian Caribbean, the relationships between these conditions and their influence on their health.

Experimental

It is a transversal descriptive case study, since it describes the health and work conditions of waste pickers taking the data at a specific moment in time. This research is a descriptive study that aims to analyze the health and work conditions in relation to the labor activity of the unionized recyclers of Cartagena de Indias in 2017.

The population corresponds to the recyclers' guild of the city of Cartagena de Indias and the sample corresponds to 126 recyclers unionized to 4 cooperatives that were in disposition to supply the information. The structured survey was used as an instrument that addressed sociodemographic conditions, health conditions, and working conditions, similar to that worked by Gómez et al¹⁵.

The survey was applied to collect the information and descriptive analysis of the variables associated with the sociodemographic, work and health conditions of the recyclers considered in the study; later, a Chi-square independence test is done to identify the associations in the socioeconomic, labor and health variables; as well as the mosaic graphs between the variables that resulted with a significant statistical association, to identify the meaning of these associations.

Results and discussion

Sociodemographic conditions

Table 1 shows the distribution of waste pickers with respect to their sociodemographic characteristics; it is observed that the greater proportion of them correspond to the masculine gender (89.68%) and present ages between 40 and 50 years (38.89%), live in their own house (11,785). With regard to basic services, all have energy services, but there is an important percentage that does not have an aqueduct or sewerage service (63.49% and 96.03% respectively); while 71.43% have a cell phone.

Table 1. Distribution of sociodemographic conditions of waste pickers

Item	Total	%
Age		
<30	26	20.63%
30-40	36	28.57%
40-50	49	38.89%
>50	15	11.90%
Gender		
Male	113	89.68%
Female	13	10.32%
Type of housing		
Rent	18	14.29%
Family	10	7.94%
Own	98	77.78%
Aqueductservice		
Yes	46	36.51%
Not	80	63.49%
Sewageservice		
Yes	5	3.97%
Not	121	96.03%
Mobile phone		
Yes	90	71.43%
Not	36	28.57%
Educationlevel		
Illiteracy	8	6.35%
Primary	83	65.87%
High school	35	27.78%
Civil status		
Married	39	30.95%
Single	21	16.67%
Free Union	66	52.38%
Head of thefamily		
Yes	121	96.03%
Not	5	3.97%
Vulnerable population		
Yes	121	96.03%
Not	5	3.97%

According to the educational level, 65.85% have only first-class training and there are even 6.35% of them who say they do not have any educational level. For marital status, 83.33% of waste pickers are married or live in a free union and the vast majority of them are the household support (96.03%); It is also observed that 96.0% belong to some vulnerable population (reintegrated, victims of violence, etc.).

The above results indicate that, at a sociodemographic level, waste pickers do not have all the basic services, have little education, are the main sustenance of their family and come from vulnerable populations. Next, the different associations that exist between these characteristics are observed.

Table 2 shows the p-values for the Chi-square independence test among the sociodemographic variables.

Table 2. p values for the Chi-square test between the socio-demographic conditions of waste pickers

	Sewerage	Head family	Civil status	Age	Education	Gender	Móvil	Time	Living place	Vulnerable
Aqueduct	0.2517	1	0.0036*	0.1207	0.2287	1	0.2812	0.4159	0.0485*	0.4935*
Sewerage		1	0.3976	0.3487	0.5747	1	0.9091	0.147	0.7395	0.4803
Family head			0.3517	0.193	0.5632	1	0.9091	0.147	0.3269	0.4803
Civil status				0.0003*	0.6366	0.1599	0.3666	0.4225	0.0477*	0.3174
Age					0.0005*	0.4771	0.0439	0.0009*	0.0030*	0.4732
Education						0.3097	0.0127	0.3501	0.0486*	0.0447*
Gender							0.9405	0.4776	0.4467	0.9873
Mobile								0.0350*	0.4487	1
Weather									0.5558	0.4215
Living place										0.0496*

* Statistical significance at 5%, values $p < 0.05$

According to the results of the chi-square test, it is observed that there is a statistical relationship between having an aqueduct service and marital status, housing and coming from vulnerable populations (values $p < 0.05$); as well as between the level of education and the fact of being head of the family, age, type of housing, having a mobile phone and the condition of coming from a vulnerable population. There are also relationships between the age of waste pickers and the level of education, marital status, type of housing, mobile phone ownership and work time; as well as the level of education is related to acquisition of mobile phone, type of housing and vulnerable population.

Next in Figure 1, the mosaic graphs for the sociodemographic conditions of the recyclers considered in the study are shown, in order to identify in what sense the relationships established between them are.

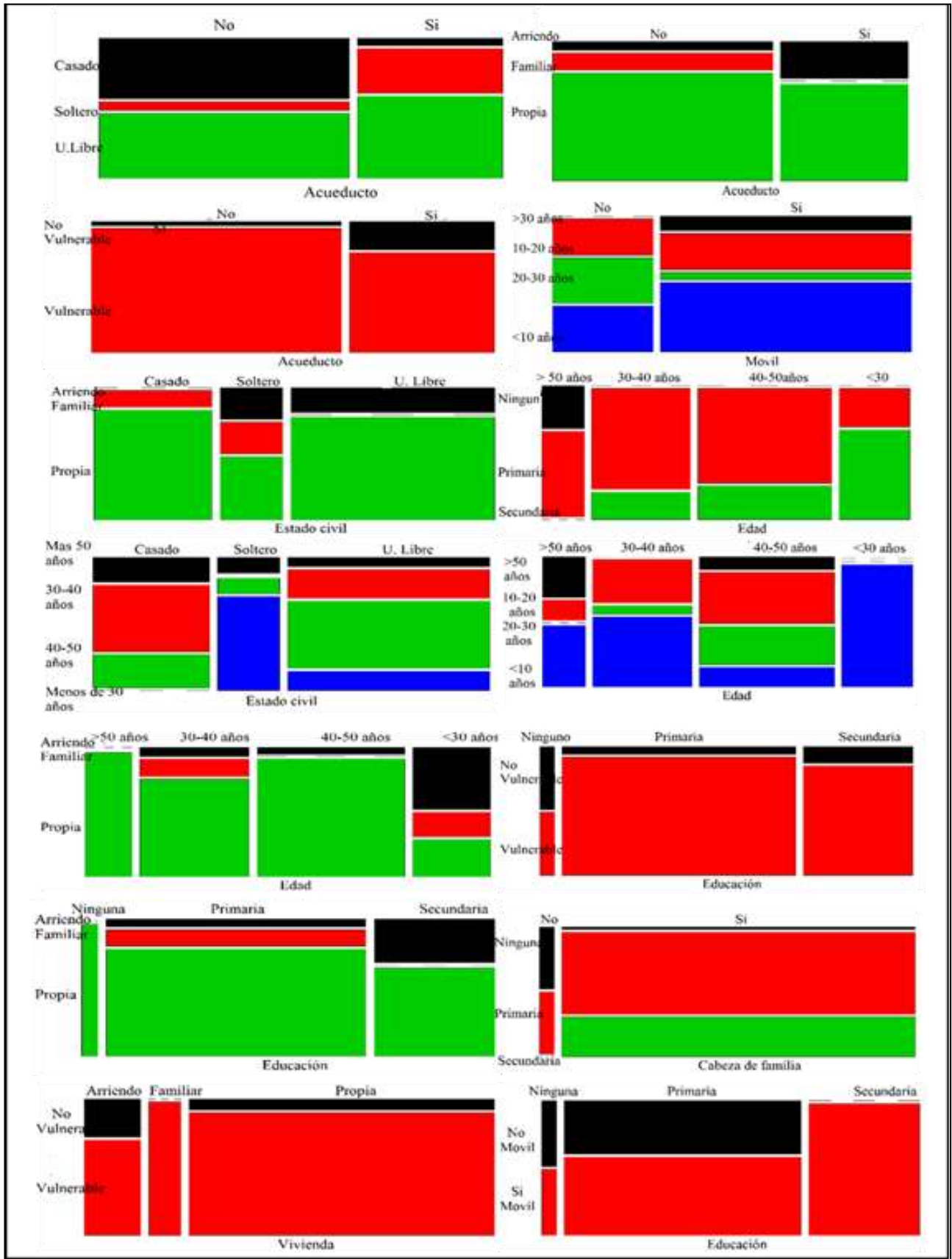


Figure 1. Mosaic charts for the sociodemographic conditions of waste pickers

The behavior of the associations between the sociodemographic conditions that resulted with statistical significance is observed (values $p < 0.05$). It is observed that waste pickers who have some type of marital union (married or free union), who own their own home or who come from vulnerable populations, are characterized by not having an aqueduct service; while those who are head of the family tend to have only primary education level. With regard to marital status, it is observed that those who live with a couple tend to have their own home and to be between 40 and 50 years old. For the age, recyclers older than 40 years are the most likely to have their own homes and have more than 10 years of experience and those over 50 have a higher level of illiteracy; while those under 30 are what most have a cell phone. It is observed that people who come from a vulnerable condition have a primary or secondary education level and their own homes; while the higher the educational level and the younger, the greater the proportion of waste pickers who have a cell phone. Finally, the recyclers of vulnerable populations have to live in family-type homes.

The foregoing indicates that people who have family, although they have their own home, do not have all the basic services and many come from vulnerable conditions, it is also highlighted that the educational level does influence the use of cell phones and that those who have a high level of High school students tend to live on rent and also that the recyclers have remained in their work since their time exercising the trade is proportional to the age in them.

Health conditions

It is observed in Table 3, that a high percentage of recyclers manifest good health (71.43%); however, external risk factors such as overweight (69.39%), cigarette consumption (46.94%) and liquor consumption (69.39%) and 26.53% say they do not feel safe at your workplace. With regard to social security affiliations, it is observed that the contribution of greater frequency is that of pension (73.47%); while only 34.69% and 42.46% quote health and occupational hazards, which indicate that feeling a future economic security prevails, but many recyclers do not worry about taking measures regarding their protection in case of illness or from an accident due to occupational risk.

Table 3. Distribution of health conditions of waste pickers

Item	Not		Yes	
	Total	%	Total	%
High weight	39	30.95%	87	69.05%
Consumption of liquor	39	30.95%	87	69.05%
Cigarette consumption	67	53.06%	59	46.94%
Security	93	73.81%	33	26.19%
Good health condition	36	28.57%	90	71.43%
Affiliated to pension	33	26.19%	93	73.81%
Affiliated to health	83	65.87%	43	34.13%
Affiliated to Risks	72	57.14%	54	42.86%

Next in Table 4, there are associations between the health conditions of waste pickers. Among the characteristics associated with the health conditions of waste pickers are relationships between some of them; It is observed that the weight of recyclers is associated with the perception of safety in the work they have; there is a relationship between cigarette consumption and the variables of health condition and pension affiliation, as well as between safety and affiliation to occupational hazards; while the pension affiliation presents association with health and occupational risk affiliations.

Table 4. p values forthe Chi-square test between the health conditions of waste pickers

	Cigarette consumption	Consumption of liquor	Security	Good health condition	Affiliated to pension	Affiliated to health	Affiliated with occupational risks
High weight	0.1145	0.5413	0.0287*	0.7148	0.8472	0.7148	0.2271
Consumption of liquor		1	0.5563	0.020*	0.1359*	0.7964	0.4324
Cigarette consumption			0.4048	0.7148	0.6466	0.7363	0.5608
Security				0.5736	1	0,5736	0.0401*
Good health condition					0.9945	0.4867	0.4836
Affiliated to pension						0.0064*	0.0106*
Affiliated to health							0.4836

*Statistical significance at 5%, values p <0.05

Next in Figure 2, the mosaic graphs are presented to explain the associations of these variables. It is observed that the recyclers that contribute to the pension are characterized by making contributions to labor risk and health; while those who consume cigarettes in general do not show good health and do not contribute to a pension. With regard to safety, those who make contributions to occupational hazards and do not present a high weight feel safer in their work zone.

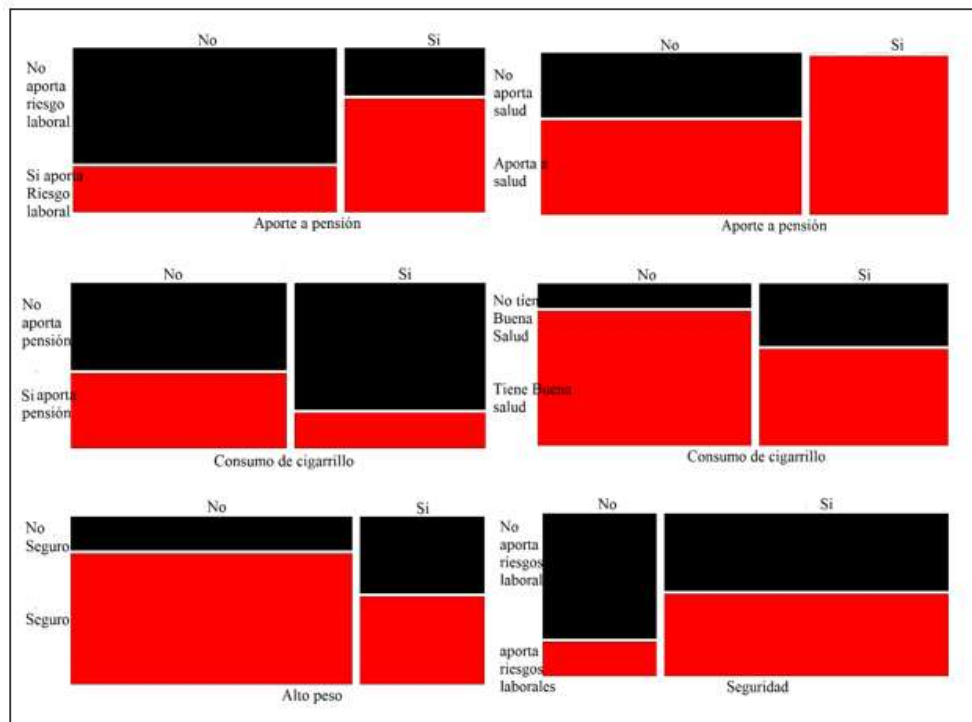


Figure 2. Mosaic charts for health conditions of waste pickers

These results indicate that there is a proportion of recyclers who do not make any of the contributions and that the fact of quoting labor risks may be generating a sense of safety in their work; while those with obesity problems express the opposite. It can also be highlighted that cigarette consumption can be a factor that influences the health condition of waste pickers.

Working conditions

In Table 5, the main risks observed in the working conditions of waste pickers are the risks for food (46.83%), washing (86.71%) and biological (93.65%); Although the majority of waste pickers say they have placed the proper vaccines, there is a 16.67 that has not placed the relevant vaccines and 38.89% that does not use protection in their work. Regarding the handling of heavy objects, 88.1% indicate that they lift heavy

objects, 85.71% claim to take risky positions and 38.89% state that they need tools to carry out their work; In addition, 40.48% said that it requires help at work. One has to emotionally, 49.21% have the perception of monotony in the work and 42.86% indicate that they talk or relate little with other people in their work (42.86%). The foregoing indicates that more awareness and education is necessary in many of the recyclers, with respect to the manipulation of objects and the security mechanisms they must have; as well as in the different cooperatives, activities must be carried out that increase the interaction between the workers and make their work more friendly.

Table 5. Description of the working conditions of waste pickers

Item	Not		Yes	
	Total	%	Total	%
Chemical hazards	106	84.13%	20	15.87%
Foods	67	53.17%	59	46.83%
Washed	18	14.29%	108	85.71%
Biological risks	8	6.35%	118	93.65%
Application of Vaccines	21	16.67%	105	83.33%
Lift heavy objects	15	11.90%	111	88.10%
Risky postures	18	14.29%	108	85.71%
Need tools	77	61.11%	49	38.89%
Combustion	105	83.33%	21	16.67%
Use protection	49	38.89%	77	61.11%
Need help	75	59.52%	51	40.48%
Conversa in your work	54	42.86%	72	57.14%
The work is monotonous	64	50.79%	62	49.21%
Climate exposure	95	75.40%	31	24.60%
Exposure to humidity	62	49.21%	64	50.79%

As shown in Table 6, within the relevant relationships in the working conditions of waste pickers, care in hand washing has a relationship with biological risks; There is an association between chemical risks and the use of vaccines, which require the use of tools. There is also a relationship between the handling of heavy objects and risky postures with the fact that waste pickers talk at work; it is observed that the exposure to the weather (sun or rain) shows relationships with chemical, biological risks, combustion risk, protection, conversation at work and monotony at work. With respect to exposure to moisture, important relationships are observed with combustion, protection, conversation at work, monotony and exposure to the weather.

Table 6. p values for the Chi-square test between the working conditions of waste pickers

	Washed	Biological	Vaccines	Heavy	Position	Tool	Combustion	Protection	Help	Conversa	Monotonous	Weather	Humidity
Chemical	1.00	1.00	0.21	0.57	0.69	0.00*	1.00	0.63	0.33	0.47	0.13	0.02*	0.27
Washed		0.04*	0.69	1.00	0.56	0.86	0.48	0.31	0.59	0.22	0.12	0.10	0.09
Biological			1.00	1.00	1.00	0.42	0.99	1.00	0.74	0.34	0.25	0.01*	0.22
Vaccines				1.00	0.69	0.16	0.84	0.27	0.33	0.13	1.00	1.00	0.65
Heavy					0.42	0.10	0.54	0.29	0.40	0.04*	0.70	0.98	0.03
Position						0.86	0.11	0.86	0.26	0.04*	0.45	0.46	0.01
Combustion								0.02	0.85	0.13	0.41	0.00*	0.10
Protection									0.88	0.13	0.31	0.00*	0.03*
Converse											0.48	0.04*	0.00*
Monotonous												0.00*	0.13
Weather													0.02*

*Statistical significance at 5%, values $p < 0.05$

Figure 3 shows the behavior of these relationships, it is observed that waste pickers who are exposed to chemical risks are also exposed to the weather and require the use of tools for their work. It is observed that recyclers that present biological risks are not exposed to the climate in general nor are they at risk from combustion; In general, recyclers exposed to the weather tend to talk at work and do not consider it monotonous, they are exposed to humidity and generally use protection.

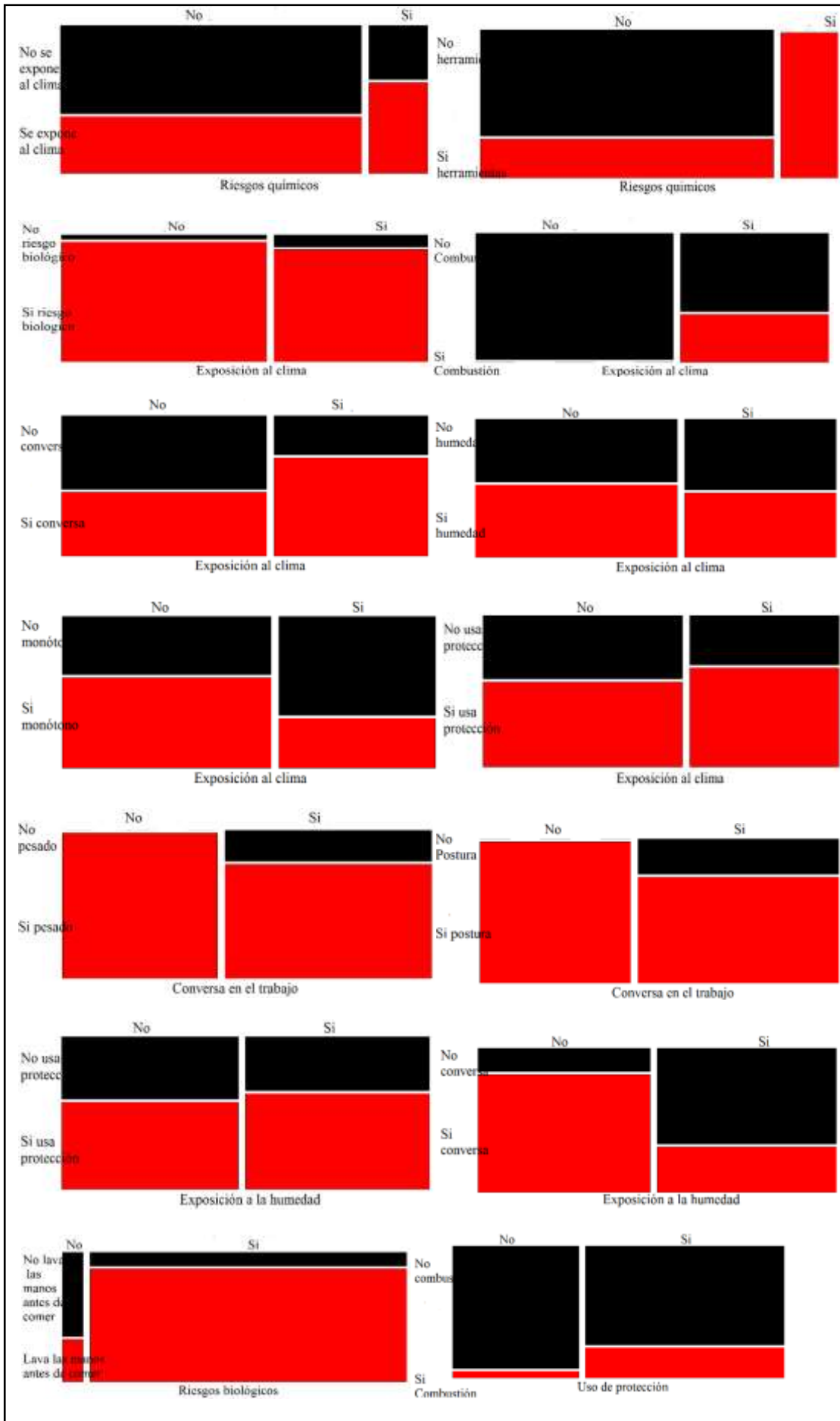


Figure 3. Mosaic charts for the working conditions of waste pickers

With regard to talking at work, we have that those recyclers who manipulate heavy objects and maintain dangerous positions, are characterized by speaking little while working. It has to recyclers who are exposed to moisture, tend to use protection and not to talk; In addition, waste pickers exposed to biological hazards wash their hands before eating and, in case of danger due to combustion, they are characterized by using protection.

Conclusions

From the results shown, from their analysis and from their discussion, the following conclusions can be obtained, on socio-demographic, health and work conditions in waste pickers:

1. Waste pickers in general, although they have their own homes, do not have all the basic services, they come from the most vulnerable population level, predominant education is primary, they are mostly heads of household and from vulnerable populations. The relationships show that the recyclers who have family, although they own their own home, do not have all the basic services and many come from vulnerable conditions, it is also highlighted that the educational level does influence the use of cell phones and that those who have a high level of High school students tend to live on rent and also that the recyclers have remained in their work since their time exercising the trade is proportional to the age in them.
2. The recyclers mostly show good health, however there are risk factors such as consumption of liquor, cigarette and overweight; which influence to that the recyclers do not feel safe in his place of work. It is also observed that recyclers tend to contribute to pension, but not to social security and labor risks.
3. For working conditions, the main risks are the consumption of food at work, biological risks, handling of heavy objects, risky positions, non-use of protection, monotony and exposure to humidity; In addition, the associations between working conditions indicate that recyclers who are exposed to chemical risks are also exposed to the weather and require the use of tools for their work; recyclers that present biological risks are not exposed to the climate in general nor are they at risk from combustion; and those exposed to the weather tend to talk at work and do not consider it monotonous. Waste pickers who are exposed to humidity tend to use protection and not talk; In addition, waste pickers exposed to biological risks wash their hands before eating and, in case of danger due to combustion, they are characterized by using protection.

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