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## INTRODUCTION

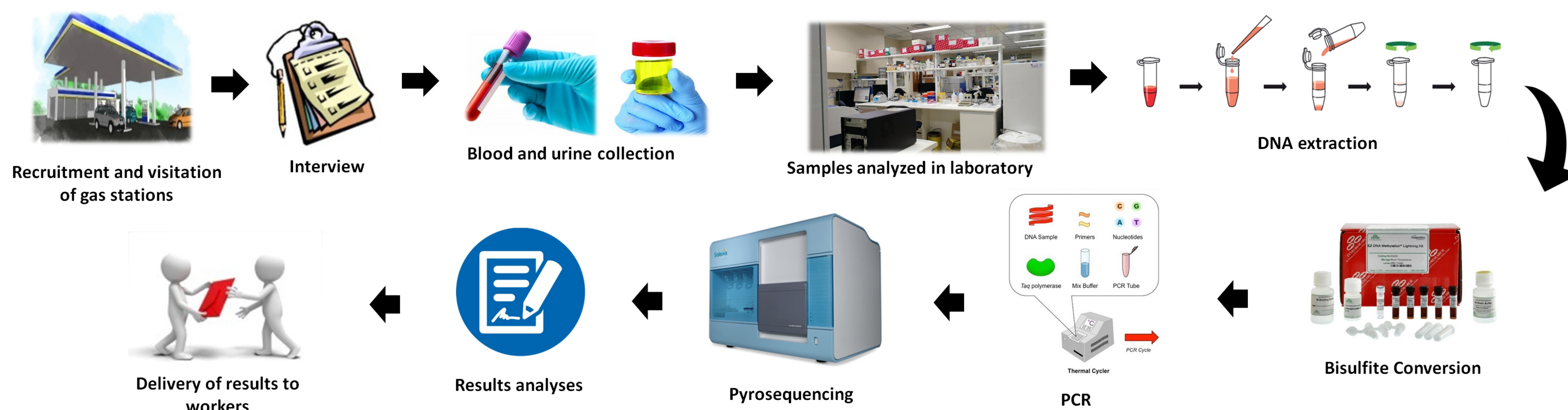
Benzene is a substance widely used by the industry and its presence is especially high in fuels such as gasoline. This solvent is classified as carcinogenic to humans (IARC, Group 1A) due to its toxicity to the hematopoietic system and association with leukemia development.

## OBJECTIVE

To evaluate the toxic effects and molecular alterations of workers exposed to benzene.

## METHODOLOGY

This is a cross-sectional study of gas station workers occupationally exposed to benzene, from Downtown and South Zones of Rio de Janeiro city. All participants are older than 18 years old and signed an informed consent form prior to study enrollment. The demographic, socioeconomic, lifestyle, clinical and occupational data of the study volunteers were collected with a validated questionnaire. Blood samples were collected for the evaluation of hematological and biochemical alterations, as well as the DNA methylation profile of repetitive elements (LINE-1 and ALU) and genes involved in DNA repair (*PARP-1*, *MGMT* and *MSH3*).



## RESULTS

From a total of 149 workers occupationally exposed to benzene, 75 were directly exposed (attendants, managers) and 74 were indirectly exposed (convenience stores). A control group of non-exposed workers, composed of office labor workers, included other 103 individuals.

**Table 1** - Demographic and socioeconomic characteristics of workers exposed and not exposed to benzene.

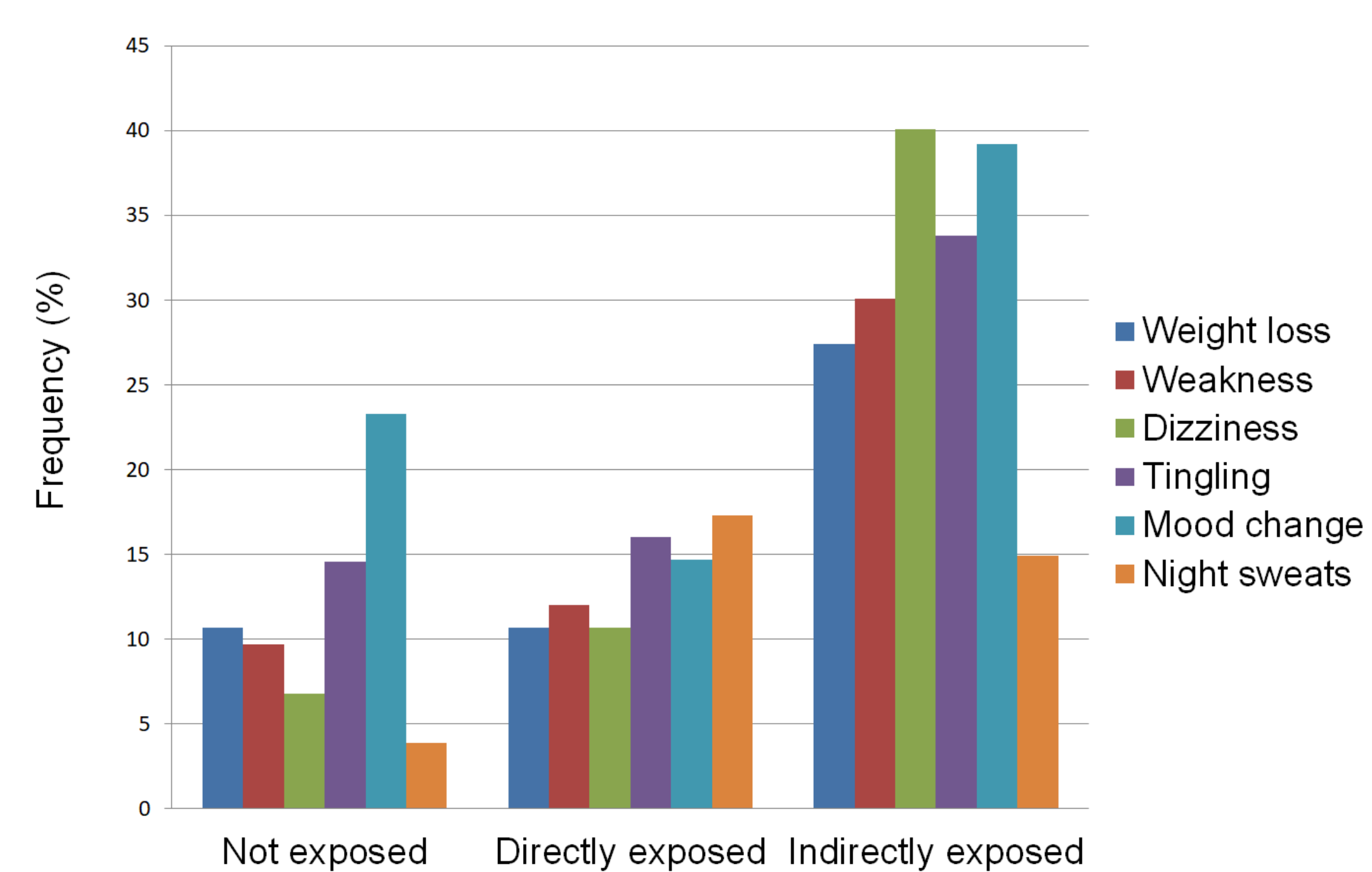
Demographic Characteristics	Not exposed	Directly exposed	Indirectly exposed	pValue	
	N (%)	N (%)	N (%)		
Gender	Male	48 (46.6)	68 (90.7)	23 (31.1)	0.0
	Female	55 (53.4)	7 (9.3)	51 (68.9)	
Median age, years (min/max)	36 (21-60)	38 (19-69)	28 (18-59)	-	
Skin color	White	46 (44.7)	20 (26.7)	17 (23.0)	0.004
	Non White	57 (55.3)	55 (73.3)	57 (77.0)	
Marital status	Married	49 (48.0)	46 (61.3)	25 (33.8)	0.003
	Unmarried	53 (52.0)	29 (38.7)	49 (66.2)	
Education	> 8 years	97 (94.2)	52 (69.3)	56 (75.7)	0.0
	≤ 8 years	6 (5.8)	23 (30.7)	18 (24.3)	
Median, family income (min-max)	6500 (1200-30000)	2000 (800-7000)	2340 (780-10000)	-	
<b>Total</b>	<b>103</b>	<b>75</b>	<b>74</b>	-	

Analysis for test Chi-Square.

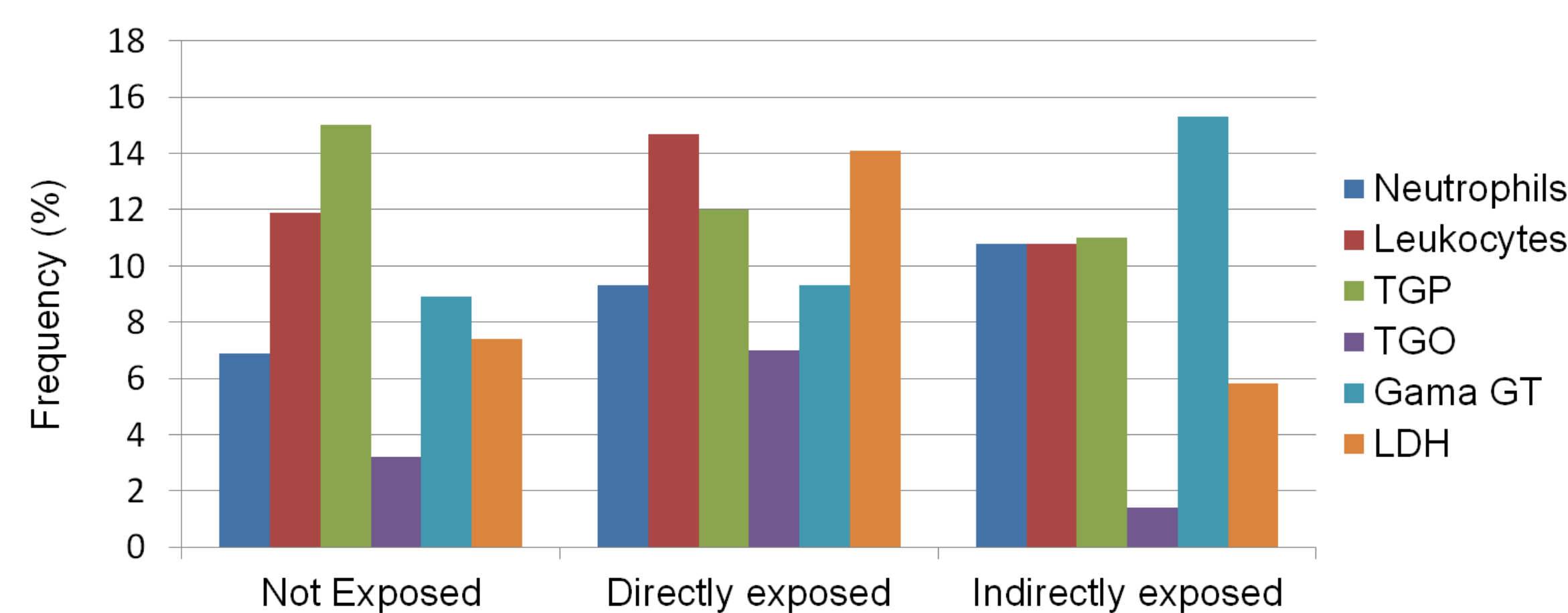
**Table 2** - Occupational activities of workers exposed to benzene

Occupational Activities	Directly exposed	Indirectly exposed	pValue
	N (%)	N (%)	
Attendant	58 (77.3)	0 (0.0)	0.0
Manager	11 (14.7)	4 (5.4)	
Lubrificator	4 (5.3)	0 (0.0)	
Car washer	1 (1.3)	2 (2.7)	
Convenience store	0 (0.0)	54 (73.0)	
Office	0 (0.0)	7 (9.5)	
Others	1 (1.3)	7 (9.5)	
<b>Total</b>	<b>75</b>	<b>74</b>	

Analysis for test Chi-Square.



**Figure 1**- Signs and symptoms reported by workers exposed and non exposed to benzene.



**Figure 2**- Main Hematological and Biochemical changes of workers exposed and non exposed to benzene.

## CONCLUSION

For the moment, we can conclude that occupational exposure to benzene induced toxic effects characteristic of benzénism.

## REFERENCES

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