

# Occupational and environmental cancer: Description of the Brazilian scene about the exposure of carcinogens to support actions in health surveillance

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## INTRODUCTION

About 80% of cancer cases are environmental-related, including those work-related, which are considered preventable cancers. International Agency for Research on Cancer (IARC) lists 111 agents known carcinogens to humans, and a considerable amount of them are available on the places where one lives and works.

## OBJECTIVE

Describe the exposure of carcinogens widely used in Brazil, such as asbestos, benzene, formaldehyde and pesticides, to subsidize prevention and health surveillance priority actions.

## METHODOLOGY

Data were collected from multiple data sources, including cancer registries, government websites, scientific publications and expert appraisals.

## RESULTS

Brazil is among the five largest producers, consumers and exporters of asbestos in the world. This substance is associated with pleural and peritoneal mesothelioma, lung larynx and stomach cancer. Data from cancer registry reveal the onset of 200 new mesothelioma and 500 new pleural cancer cases in six capitals cities in Brazil over the last 10 years (Table 1). Another carcinogen is benzene, studies conducted among gas stations workers exposed to benzene, a carcinogen associated with the development of leukemia, revealed alarming clinical and genetic alterations (Table 2). Formaldehyde, agent associated with nasopharyngeal cancer, is widely used as hair straightener in Brazil, despite the prohibition of its use to this purpose. This is worrying since the number of salons grew by 78% in five years - from 309,000 in 2005 to 550,000 in 2010 (SEBRAE-SP, 2012). Besides that, Brazil is considered the first consumer of pesticides, substances possibly associated with cancers (breast, lymphoma, leukemia, ovarian, pancreas, kidneys, stomach and testis). The chronic effects of pesticides (cancer, for instance) has been the subject of forums, conferences and seminars across the country, including within the Brazilian National Cancer Institute.

**Table 1:** Mesothelioma and pleural cancer rates, according Cancer Registry Population Based (RCBP), in six Brazilian capitals: periodo 1997-2006

RCBP	Mesothelioma (N)	Pleural cancer (N)	População <sup>1</sup>	Rates mesothelioma <sup>2</sup>	Rates pleural cancer <sup>2</sup>
Fortaleza	13	70	2.141.402	6.1	32.7
Recife	19	60	1.422.905	13.4	42.2
Belo Horizonte	15	32	2.238.526	6.7	14.3
São Paulo	142	216	10.434.252	13.6	20.7
Curitiba	10	31	1.587.315	6.3	19.5
Porto Alegre	22	141	1.409.351	15.6	100.0
<b>Total</b>	<b>221</b>	<b>550</b>	<b>19.233.751</b>	<b>11.5</b>	<b>28.6</b>

<sup>1</sup> National Survey IBGE, 2000  
<sup>2</sup> for 100.000 inhabitants

**Table 2:** Percentual distribution of main clinical alterations self-reported and chromosomal aberrations analysed

Major clinical complaints (related)	
Visual discomfort	<b>41.8%</b>
Osteoarticular and respiratory problems;	<b>27.0%</b>
Gastrointestinal problems	<b>18.3%</b>
Respiratory problems	<b>14.8%</b>
Cytogenetic analysis (chromossos 1, 2 and 4)	
Total chromosomal changes (for 1,000).	<b>9.2%</b>
Translocations	<b>40.0%</b>
Deletions	<b>23.7%</b>
Monosomies	<b>14.5%</b>
Chromosome breakage	<b>12.7%</b>
Chromosome fragments	<b>7.3%</b>
Trisomies	<b>1.8%</b>

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## CONCLUSION

The situation of environmental and occupational exposure in Brazil differs from that of developed countries regarding the cited carcinogenic. The current use of asbestos, the exposure of benzene for gas stations' workers, the intensive and indiscriminate use of pesticides and the peculiar use of formaldehyde to straighten hair are important issues in public health, that need to be discussed and solved.