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Comparison of mortality attributable to tobacco in selected Latin American countries

Laura Débora Acosta, Florencia Molinatti, & Enrique Peláez

Comparison of mortality attributable to tobacco in selected Latin American countries

Mortalidad atribuible al consumo de tabaco en países seleccionados de América Latina

Laura Débora Acosta[1], Florencia Molinatti[2], & Enrique Peláez[3]

—— **RESUMEN: Objetivo:** Comparar la mortalidad atribuible al consumo de tabaco en países seleccionados de América Latina (Argentina, Brasil, Chile y México) entre los años 2009 y 2013. **Método:** Se utiliza la metodología de Evaluación Comparativa de Riesgos (CRA) para estimar la mortalidad atribuible; luego se calculó los años de esperanza de vida perdidos (AEVP), siguiendo la metodología propuesta de Arriaga. Se utilizaron datos secundarios de la agencia nacional de estadísticas de cada país. **Resultados:** Los mayores porcentajes de muerte por tabaco se observaron entre los hombres argentinos y chilenos (14,4 y 14,3 % del total de muertes, respectivamente), seguidos por los mexicanos (12,5 % del total de muertes). Entre las mujeres, el mayor porcentaje se registró en Chile (8 % del total de muertes), seguido por México y Argentina (5,3, y 5,1 % del total de muertes, respectivamente). Para ambos sexos, Brasil registró los menores porcentajes (5,4 y 2,8 % del total de muertes, para hombres y mujeres). En términos de esperanza de vida, los más afectados por la mortalidad debido al consumo de tabaco fueron los hombres y las mujeres de Argentina, quienes perdieron 1,77 y 0,65 años de esperanza de vida, respectivamente, seguidos muy de cerca por los hombres y mujeres chilenas. **Conclusiones:** Los hombres y mujeres de Argentina presentaron la mayor pérdida de años de vida a causa del tabaco. Este hecho concuerda con la incipiente implementación de la política antitabaco en este país. En cambio, en los otros países estudiados las políticas de control han sido implementadas más tempranamente. Sin embargo, el tabaco sigue siendo una importante causa de mortalidad en todos estos países, a pesar de los grandes esfuerzos para reducir su consumo.

—— **Palabras Clave:** Enfermedades No transmisibles- Mortalidad- Tabaco – Salud Pública – América Latina

—— **ABSTRACT: Objective:** To compare the mortality attributable to tobacco consumption in selected Latin American countries (Argentina, Brazil, Chile, and Mexico) between the years 2009 and 2013. **Methods:** In order to estimate the mortality attributable to risk factors, the Comparative Risk Assessment (CRA) methodology was used. Years of Life Expectancy Lost (YLEL) were calculated following the methodology proposed by Arriaga. Secondary data from the national statistics agency of each country were used. **Results:** The highest percentages of all deaths due tobacco were observed among Argentinian and Chilean men (14.4 and 14.3% of the total deaths, respectively), followed by Mexicans (12.5% of the total deaths). Among women, the highest percentage was registered in Chile (8% of total deaths), followed by Mexico and Argentina (5.3, and 5.1% of total deaths, respectively). For both sexes, Brazil recorded the lowest percentages (5.4 and 2.8% of the total deaths, for men and women). In terms of life expectancy, the most affected by mortality due to tobacco consumption were the men and women of Argentina, who lost 1.77 and 0.65 years of life expectancy, respectively, followed very closely by the Chilean men and women. **Conclusions:** Men and women of Argentina had the greatest loss of life expectancy due to tobacco; this is consistent with the incipient policy against tobacco implemented in that country. In contrast, in the other countries studied, tobacco control policies were implemented earlier. However, tobacco remains an important cause of mortality in all these countries, despite the great efforts to reduce its consumption.

—— **Keywords:** Non-communicable diseases- Mortality- Tobacco – Public health – Latin America

[1] Centro de Investigaciones y Estudios sobre Cultura y Sociedad (CIECS), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) y Universidad Nacional de Córdoba, ARGENTINA. ldacosta@conicet.gov.ar
[2] Centro de Investigaciones y Estudios sobre Cultura y Sociedad (CIECS), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) y Universidad Nacional de Córdoba, ARGENTINA. fmolinatti@conicet.gov.ar
[3] Centro de Investigaciones y Estudios sobre Cultura y Sociedad (CIECS), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET) y Universidad Nacional de Córdoba, ARGENTINA. epelaez@eco.unc.edu.ar

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1. Introduction

Preventable risk factors are the basis of most non-communicable diseases (NCD) such as cancer, diabetes mellitus, cardiovascular diseases, chronic respiratory diseases, and external causes. Risk factors such as smoking, physical inactivity, an unhealthy diet, and harmful alcohol use are responsible for a large part of the global burden of morbidity and mortality, either directly or through conditions such as hypertension, hyperglycemia, and hypercholesterolemia (World Health Organization [WHO], 2016).

Particularly, tobacco use is associated with disabilities and NCD deaths: cancers, especially lung cancer, cardiovascular disease, and diseases of the respiratory system (Öberg, Jaakkola Maritta, Woodward, Peruga, & Prüss-Ustün, 2011). According to World Health Organization (2013) data, tobacco kills up to half of its consumers, about 6 million people, more than 5 million of whom are consumers of the product and more than 600 000 are non-smokers exposed to other people's smoke. Almost 80% of the world's 1 billion smokers live in low- or middle-income countries. It is the leading cause of worldwide preventable death.

Nearly 70 million smokers in Latin America are at risk of tobacco-related death and disease, according with The Tobacco Atlas, Sixth Edition (American Cancer Society, 2016). For example, smoking is the single most important cancer risk factor and accounts for 26% of all cancer deaths and 84% of lung cancer deaths in Latin America (Yamaguchi *et al.*, 2017). While the proportion of the population who use tobacco has nearly halved across the region thanks to strong tobacco control policies in some countries, the region is seeing an increase in tobacco-related deaths, to more than 300 000 in 2016 (American Cancer Society, 2016).

To reduce the public health threat of tobacco use, the WHO has promoted the ratification of the WHO Framework Convention on Tobacco Control (FCTC) and developed demand reduction tools to help countries reduce tobacco use.

> Specifically, the "MPOWER" package advocates the following evidence-based strategies: Monitor tobacco use and prevention policies; Protect people from tobacco smoke; Offer help to quit tobacco use; Warn about the dangers of tobacco; Enforce bans on tobacco advertising, promotion, and sponsorship; and Raise taxes on tobacco. (Ahluwalia, Arrazola, & Graffunder, 2017, p.10)

Argentina, Chile, Cuba, and Uruguay have the highest smoking prevalence in Latin American-Caribbean countries and, in the last ten years, the impact of smoking meant the loss of between two and six years in life expectancy among men 50 years and over (Palloni, Novak, & Pinto-Aguirre, 2015). In these countries, the level of implementation of MPOWER package has not been homogeneous, but most of them (Argentine, Chile, Brazil, and Uruguay) implemented four to six strategies (Blanco, Sandoval, Martínez-López & Caixeta, 2017).

Raising tobacco taxes to make these deadly products unaffordable is the most cost-effective measure to reduce tobacco use or to prevent its initiation among youth. Argentina and Chile are the only countries in Latin America that have taxes on tobacco products of at least 80% of the retail price. In contrast, in Brazil and Mexico the share of total taxes in the retail price does not reach 70% but the cigarettes are less affordable since 2008 (World Health Organization, 2017).

Based on this background, the goal of this study is to compare the mortality attributable to tobacco use, in selected Latin American countries (Argentina, Brazil, Chile, and Mexico) between the years 2009 and 2013.

2. Methods

2.1. Data

This study compared the differences in mortality attributable to tobacco use[4] in Argentina, Brazil, Chile, and Mexico, by using official secondary data. The data on the smoking prevalence (P_i) were obtained from several surveys carried out in the countries studied:

— Argentina. Encuesta Nacional de Factores de Riesgo (ENFR) 2013 [2013 National Survey of Risk Factors],
— Brazil. Pesquisa Nacional de Saúde (PNS) 2013 [2013 National Health Survey],
— Chile. Encuesta Nacional de Salud (ENS) 2009-2010 [2009-2010 National Health Survey], and
— Mexico. Encuesta Nacional de Salud y Nutrición (ENSANUT) 2012 [2012 National Health and Nutrition Survey].

The Relative Risks (RR) corresponding to each cause of death related to tobacco use were obtained from meta-analyses (United States Department of Health and Human Services, 2014), as established by the Comparative Risk Assessment (CRA) methodology.

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[4] Tobacco use was classified in three categories: 1) Smoker: the person who has smoked at least 100 cigarettes in his or her lifetime and currently smokes all or some days, 2) Former-smoker: the smoker who no longer smokes; and 3) person who has never smoked is the person who has never smoked or smoked less than 100 cigarettes in their entire life. Exception: Considering that the Brazilian National Health Survey did not inquire whether the person had smoked 100 or more cigarettes in their lifetime, a person who smokes daily or occasionally is considered a smoker.

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Mortality observed (MO) and population data were obtained from public-use microdata files and statistical yearbooks prepared by the national agencies responsible for their registration:

1. Argentina. Ministerio de Salud de la Nación, Dirección de Estadísticas e Investigación en Salud (MSAL-DEIS) 2012-2014

2. Brazil. Ministério de Saúde do Brasil. Sistema de Informações sobre Mortalidade (MS-SIM) 2012-2014

3. Chile. Ministerio de Salud de Chile, Departamento de Estadísticas e Información de Salud (MINSAL-DEIS) 2009-2011, and

4. Mexico. Secretaría de Salud de México. Sistema Nacional de Información en Salud (SSA-SINAIS) 2011-2013).

The quality and internal consistency of the databases were evaluated. According to the latest report on health statistics of the World Health Organization (2014b), the four countries analyzed have a mortality registry coverage of more than 90% and the proportion of deaths without registration of sex or age is less than 2%; these were imputed according to the distribution of the valid data.

The calculations of mortality attributable (MA) and Years of Life Expectancy Lost (YLEL) were performed using the Epidat (2016) software: a piece of software for epidemiological data analysis, Version 4.2.

2.2. Attributable Risk Calculation

To estimate the mortality attributable to tobacco, the Comparative Risk Assessment methodology [CRA] (Ezzati *et al.*, 2006) was used. The CRA methodology is based on the fact that the contribution of a risk factor to mortality can be estimated by means of the Population Attributable Fraction (PAF), comparing the burden due to the exposure observed in the population with a hypothetical distribution. This hypothetical distribution is defined as a counterfactual scenario (Mathers, Vos, Lopez, Salomon, & Ezzati, 2001). The PAF formula for discrete variables tobacco use with n exposure levels is (see equation 1):

$$PAF = \frac{\sum_{i=1}^{n} P_i \times RR_i - \sum_{i=1}^{n} P\prime \times RR_i}{\sum_{i=1}^{n} P_i \times RR_i}$$ (equation 1)

where n is the number of exposure categories or levels, P_i the prevalence of the exposure category (prevalence of smoking prevalence obtained from several surveys carried out), RR_i is the relative risk in the exposure category (United States Department of Health and Human Services, 2014), and $P\acute{}_i$ the prevalence of exposure in the counterfactual scenario.

Then, MO due to tobacco use was multiplied by the attributable fraction obtained and the MA to tobacco use was obtained (see equation 2).

$$MA = MO \times PAF$$ (equation 2)

2.3. Years of Life Expectancy Lost Calculation

Once the attributable deaths were estimated, the YLEL were calculated following the methodology proposed by Arriaga (2014). The method of calculation of the YLEL is based on the life tables and allows adjustment by age structure of the population. Unlike other methods, such as the Years of Potential Life Lost (YPLL) developed by Pan American Health Organization, or the Healthy Life Years (HLY) index, the YLEL index is not affected by the age structure of the population. YLEL were calculated between ages 35 and 80. These age limits were used for two reasons: first, because the RRs estimated in the meta-analyses were estimated as of 35 years; second, because the average life expectancy in the countries studied is approximately 80 years.

3. Results

Argentina, Brazil, and Mexico had a prevalence of smoking among men higher than 20% and lower than 30%, while Chile is 37.7 % (see table 1). In the case of Chilean women, a smoking prevalence of 33% stands out. Argentina and Brazil had a prevalence among women lower than 20%, and Mexican women had the lowest prevalence (8.7%).

Table 1

Argentina, Brazil, Chile and Mexico, 2009-2013: Prevalence of smokers, former smokers and people who never smoked for the adult population aged 35 and over, by gender and age group

Age group	Tobacco use	Argentina 2013		Brazil 2013		Chile 2009-10		Mexico 2012	
		Men	Women	Men	Women	Men	Women	Men	Women
35 to 64 years	Smokers	30.6	22.7	21.9	14.9	42.6	37.6	30.2	9.6
	Former smokers	23.3	16.7	23.8	17.5	30.0	21.4	26.4	10.2

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	Never smoked	46.1	60.6	54.3	67.6	27.4	41.1	43.5	80.2
	Smokers	12.4	10.4	13.9	7.1	11.8	14.4	17.1	4.5
Aged 65 and over	Former smokers	44.3	17.3	45.7	20.7	42.2	22.2	45.2	13.5
	Never smoked	43.3	72.3	40.4	72.2	46.0	63.4	37.7	82.0
	Smokers	26.7	19.3	20.4	13.3	37.7	33.0	27.9	8.7
Total population aged 35 and over	Former smokers	27.8	16.8	27.9	18.2	32.0	21.5	29.7	10.8
	Never smoked	45.5	63.9	51.7	68.5	30.4	45.5	42.5	80.5

Source: Argentina: ENFR 2013 / Brazil: PNS 2013 / Chile: ENS 2009-10 / Mexico: ENSANUT 2012. Own research with Epidat (2016) 4.2

In the case of people over 65, both Brazilian and Mexican men had the highest prevalence among smokers and former smokers, covering approximately 60% of the population of that age, followed by Argentinian and Chilean men. In the case of women, Mexican women were the smokers (both current and past) who smoke the least, with a prevalence of 18%.

In the case of the 35-64 age group, the trend was quite different: Chilean men had the highest prevalence, more than 72% of the population of that age (including smokers and ex-smokers). In the second place were the Chilean women, with a prevalence close to 59%. Among women, less than 40% of Argentinian women smoked at least once in their lifetime and that percentage was lower among Brazilian women, less than 33%.

Regarding the weight of the deaths attributable to tobacco in the general mortality of the country, it was observed that among Argentinian and Chilean men, smoking deaths accounted for just over 14% of the total. Among women, the highest percentage of all deaths due to tobacco was recorded in Chile (8%) (see table 2).

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Table 2

Argentina, Brazil, Chile and Mexico, 2009-2013: Mortality attributable to tobacco use by gender and large groups of causes of death

Causes of death (ICD-10 code)	Argentina 2013		Brazil 2013		Chile 2009-10		Mexico 2012	
	Men	Women	Men	Women	Men	Women	Men	Women
Malignant neoplasms	9,195	2,916	29,028	9,800	2,843	1,223	7,316	2,180
Cardiovascular diseases	7,890	2,626	29,267	12,877	2,260	1,101	13,479	3,779
Respiratory diseases	4,780	1,887	33,801	17,814	1,510	1,037	43,291	6,522
All deaths attributable to tobacco	21,865	7,430	92,347	40,581	6,614	3,360	35,511	12,481
All deaths	**151,969**	**146,779**	**1,701,410**	**1,426,386**	**46,353**	**41,970**	**278,393**	**235,543**
Percentage of all deaths attributable to tobacco	14.4	5.1	5.4	2.8	14.3	8.0	12.6	5.3

Source: Argentina: ENFR 2013. MSAL-DEIS, 2012-2014 / Brazil: IBGE - PNS 2013. MS-SIM, 2012-2014 / Chile: ENS 2009-10. MINSAL-DEIS, 2009-2011 / Mexico: ENSANUT 2012. SSA-SINAIS, 2011-2013. Own research with Epidat (2016) 4.2

Performing a simple cause analysis, it could be observed that among men and women in Argentina and Chile, the main cause of death attributable to smoking was cancer of the trachea, lung or bronchus. In Brazil and Mexico, however, others chronic obstructive pulmonary diseases (COPD) were the leading cause of death (see table 3in the end of article).

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When analyzing the impact that these prevalence had on mortality using the YLEL methodology (see table 4), it could be observed that the most affected by mortality due to tobacco use were Argentinian men, who lost 1.77 years of life expectancy, followed by the Chilean men who lost 1.28 years of life expectancy. Mexican men lost 0.95 years of life expectancy, and Brazilian men had the lowest loss of years (0.65). Among women, the greatest loss of years of life expectancy was recorded in Argentinian women (0.65), followed by Chilean (0.53); Mexican women loss 0.31 years and Brazilian women had the lowest loss of years of life expectancy (0.28).

Table 4

Argentina, Brazil, Chile and Mexico, 2009-2013: Comparison of YLEL attributable to tobacco use in adults aged 35 and over, by gender and groups of causes of death

Groups of causes of death	Argentina 2013		Brazil 2013		Chile 2009-10		Mexico 2012	
	Men	Women	Men	Women	Men	Women	Men	Women
Malignant neoplasms	0.82	0.28	0.25	0.09	0.59	0.23	0.25	0.08
Cardiovascular diseases	0.69	0.24	0.27	0.12	0.53	0.23	0.49	0.12
Respiratory diseases	0.26	0.12	0.13	0.07	0.16	0.08	0.21	0.10
Total causes attributable to tobacco use	1.77	0.65	0.65	0.28	1.28	0.53	0.95	0.31
Other causes not attributable to tobacco use	5.82	4.07	7.39	4.70	4.76	3.05	6.59	4.64
Total YLEL	**7.59**	**4.72**	**8.04**	**4.99**	**6.04**	**3.58**	**7.53**	**4.95**

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4. Discussion

The objective of this study was to compare the mortality attributable to tobacco use in selected Latin American countries between the years 2009 and 2013. We found that, between males, the most affected groups by mortality due to tobacco use were Argentinian men and, between females, were Argentinian women.

Differences in the level of mortality attributable to tobacco between the countries studied could be explained by the prevalence of tobacco use and the prevalence and incidence of NCD in each population. The first issue is related to the policies of prevention and promotion of health, and the second issue is associated with the health system in each country, in addition to epidemiologic transition and population aging in the countries studied.

Although the highest prevalence of tobacco use was recorded in Chile, both among men and women, the greatest loss of years of life expectancy was observed in Argentina. In the same way, although Mexico and Argentina have close smoking prevalence (slightly over 25% of men aged 35 and over currently smoke), the proportion of deaths attributable to this factor is higher in Argentina (14.4% versus 12.6%); and Mexican men lose less years of life expectancy (1.77 versus 0.95). The factors that can explain these facts could be found in the daily number of cigarettes smoked, the average age of the onset of smoking, the age at which former smokers quitted, among others.

In addition, highest loss of years of life expectancy observed in Argentina could be explained by policies applied against tobacco, related specially with protecting people from tobacco smoke. In this sense, in Chile, like Brazil and Mexico, the highest level of application of the MPOWER package was achieved, particularly in relation to tobacco monitoring and the application of control policies, and health warnings about tobacco hazards between three and six years earlier than in Argentina (Organización Panamericana de la Salud [OPS], 2016). Brazil, along with Uruguay and Panama, has been a continental leader in tobacco control; it has implemented progressively stronger tobacco control policies to more than halve smoking prevalence since 1980. In Argentina smoking rates are falling, but the country has yet ratify the WHO FCTC, and cigarettes are extremely affordable (Burki, 2017). In fact, in the group of 65 years and more the prevalence of ex-smokers in both sexes in almost every country is almost double that of smokers. What would be reflecting success in awareness are campaigns to stop smoking, combined with the abandonment of habit due to health complications.

Another explanation is related to incidence and treatment of illness associated to tobacco, and health system in each country. In Argentina and Chile, the main cause is neoplasms, especially cancer of the trachea, lung or bronchus with a 5-year survival

rate of 49% (American Cancer Society, 2016), in Mexico and Brazil, it is the COPD, with a 5-year survival rate of 74% (Solanes & Casan, 2010).

Compared with figures from other countries, it is observed that, while Brazil and Mexico have an incidence of deaths caused by tobacco use lower than other countries, Argentina and Chile show values similar to those recorded in Spain (Gutiérrez-Abejón *et al.*, 2015) and Uruguay (Sandoya & Bianco, 2011) and slightly higher than those observed in Paraguay (Sánchez & San Martín, 2010).

Estimates of the number of deaths attributable to tobacco use are lower than those achieved by other studies such as those carried out by the Institute for Clinical Effectiveness and Health Policy (IECS) work team (Instituto de Efectividad Clínica y Sanitaria [IECS], 2017a, 2017b, 2017c; Pinto *et al.*, 2017), by Argentine Observatory on Drugs (Observatorio Argentino de Drogas, 2016), and by Guerrero López, Munos-Hernandez, Saenz De Miera-Juarez, & Reynales-Shigematsu (2013), particularly in Brazil and Mexico. Nevertheless, these differences can be possibly explained by the application of different methodologies, the selection of sources of information and the incorporation of parameters[5].

This paper has some limitations. One limitation of our study was related to the source of data of the Brazilian National Health Survey, because a person who smokes daily or occasionally is considered a smoker, and it did not inquire whether the person had smoked 100 or more cigarettes in their lifetime, like other sources of data. This fact could affect the prevalence of smoking in Brazil.

Another limitation was related to the quality of mortality data, with an underreporting of mortality of about 1% in Chile and of up to 9% in Brazil in 2009. Moreover, wrongly defined causes are high in Argentina and Brazil (around 8%) (Comisión Económica para América Latina y el Caribe [CEPAL], 2014). In addition, garbage codes are high in these countries: in average, in the period 1998-2011 about 22% in Argentina, 21% in Brazil, 6% in Mexico and 11% in Chile (World Health Organization, 2013). Both, underreporting of mortality and garbage codes could affect the prevalence of mortality related to tobacco, especially in Argentina and Brazil.

Finally, it is important to clarify that tobacco use is just one cause of disease, and non-communicable diseases are associated with the effects of multiple causes: genetic, lifestyle and environmental factors. In this sense, differences in mortality attributable to tobacco between these countries could reflect other factors not studied in this paper. For example, Mexican women had higher loss of years of life expectancy than Brazilian women due to respiratory diseases; despite Brazilian women had a higher prevalence of tobacco use than Mexican women. One possible explanation is that women in Mexico are more exposed to other risk factors to respiratory diseases (for example, occupational and environmental air pollution).

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[5] For example, to estimate people's probabilities of getting sick or die from each of the conditions associated with smoking, IECS used a mathematical model. In all countries the data correspond to 2015 and to people over 35 years of age (IECS, 2017a, 2017b, 2017c, Pinto *et al.*, 2017).

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5. Conclusion

We found that the groups most affected by mortality due to tobacco use were Argentinian men and women, and this fact is according to incipient policy against tobacco in that country; while in Brazil, México and Chile tobacco policy control was implemented early. Despite this, tobacco use is still an important cause of death in these countries. The results of this study indicate the importance of considering tobacco consumption as a public health issue in these countries. Efforts to reduce tobacco use have been significant, but they are far from being sufficient.

The Political Declaration of the High-level Meeting of the United Nations General Assembly on the Prevention and Control of Non-Communicable Diseases, adopted in September 2011, recognize that effective non-communicable disease prevention and control require leadership and multisectoral approaches for health at the government level, including, as appropriate, health in all policies and whole-of-government approaches across such sectors as health, education, energy, agriculture, sports, transport, communication, urban planning, environment, labour, employment, industry and trade, finance, and social and economic development (World Health Organization, 2014a).

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7. Financiamiento

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Table 3

Argentina, Brazil, Chile and Mexico, 2009-2013: Number and percentage of all deaths attributable to tobacco by gender and cause of death

Causes of death (ICD-10 code)	Argentina 2013				Brazil 2013				Chile 2009-2010				Mexico 2012			
	Men		Women		Men		Women		Men		Women		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Malignant neoplasms	**9,195**	**61.2**	**2,916**	**32.3**	**29,028**	**61.5**	**9,800**	**33.1**	**2,843**	**49.1**	**1,223**	**30.5**	**7,316**	**57.4**	**2,180**	**17.7**
Lip, oral cavity, pharynx (COO-C14)	454	72.7	90	36.2	4,079	73.3	559	37.4	100	70.4	28	41.9	509	74.7	103	28.6
Esophagus (C15)	846	69.7	249	42.1	4,302	70.1	848	48.2	280	66.2	120	48.4	526	71.8	85	36.9
Pancreas (C25)	401	21.3	359	17.3	935	22.0	766	17.9	113	23.0	138	23.0	428	24.7	257	12.8
Larynx (C32)	561	81.3	69	62.2	2,999	81.8	339	65.1	94	76.8	10	53.6	604	82.5	58	53.0

Causes of death (ICD-10 code)	Argentina 2013				Brazil 2013				Chile 2009-2010				Mexico 2012			
	Men		Women		Men		Women		Men		Women		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Trachea, lung, bronchus (C33-C34)	5,530	87.1	1,845	63.9	12,736	87.1	6,147	63.8	1,419	85.7	676	68.2	3,682	88.0	1,240	53.0
Cervix uteri (C53)	n/a	n/a	114	11.8	n/a	n/a	445	9.0	n/a	n/a	78	n/a	0	n/a	214	n/a
rinary bladder (C67)	427	42.8	64	18.0	1,070	44.0	233	20.8	113	40.4	35	24.8	308	46.9	51	15.7
Kidney and renal pelvis (C64-C65)	457	37.1	24	4.2	631	36.8	37	3.7	149	37.1	11	5.1	460	39.6	18	2.5
Stomach (C16)	473	25.8	89	8.5	2,277	25.8	427	8.8	557	25.4	119	11.0	799	28.0	153	6.1
Acute myeloid leukemia (C92.0)	46	21.7	13	7.4	/a/	/a/	/a/	/a/	17	22.9	7	9.4	/a/	/a/	/a/	/a/
Cardiovascular diseases	**7,890**	**18.5**	**2,626**	**6.1**	**29,267**	**21.0**	**12,877**	**11.1**	**2,260**	**19.7**	**1,101**	**10.6**	**13,479**	**21.2**	**3,779**	**6.5**

Causes of death (ICD-10 code)	Argentina 2013				Brazil 2013				Chile 2009-2010				Mexico 2012			
	Men		Women		Men		Women		Men		Women		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Coronary heart disease (I20-I25)	2,570	21.8	728	8.8	14,256	23.5	5,321	12.1	1,029	23.1	376	12.9	9,229	22.5	2,321	7.1
Other heart diseases (I00-I09, I26-I28, I29-I51)	3,284	16.0	974	4.0	4,189	18.5	1,402	7.7	389	16.6	187	7.1	1,313	19.2	345	4.3
Cerebrovascular disease (I60-I69)	1,412	15.6	791	8.2	7,856	15.9	4,887	10.0	634	15.3	439	10.1	2,594	17.4	1,023	6.3
Atherosclerosis (I70)	32	20.1	5	1.6	132	24.6	23	3.4	25	39.9	7	8.8	39	26.8	6	3.2
Aortic aneurysm (I71)	560	61.0	109	34.2	2,566	62.5	1,062	39.5	162	61.3	76	44.2	215	64.1	39	29.5
Other arterial disease (I72-I78)	32	11.8	18	7.1	269	13.7	183	9.0	21	12.2	16	9.5	89	15.9	45	6.8
Respiratory diseases	**4,780**	**34.4**	**1,887**	**13.9**	**33,801**	**51.7**	**17,814**	**31.0**	**1,510**	**46.4**	**1,037**	**33.5**	**43,291**	**217.2**	**6,522**	**39.5**

Causes of death (ICD-10 code)	Argentina 2013				Brazil 2013				Chile 2009-2010				Mexico 2012			
	Men		Women		Men		Women		Men		Women		Men		Women	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Influenza, pneumonia (J10-J11, J12-J18)	1,975	19.1	691	5.9	6,182	20.2	2,366	7.4	303	18.3	133	7.5	2,120	28.9	407	6.6
Bronchitis, emphysema (J40-J42, J43)	186	86.9	87	63.4	2.796	89.3	1,425	72.0	95	84.3	68	75.3	8,296	353.1	1,027	67.0
Other chronic obstructive pulmonary diseases (J44)	2,619	78.4	1,109	59.9	24,823	78.5	14,023	59.9	1,112	74.9	836	67.8	32,875	320.9	5,089	57.5
TOTAL deaths attributable to tobacco	**21,865**	**30.5**	**7,430**	**11.3**	**92,347**	**36.5**	**40,581**	**19.8**	**6,614**	**32.3**	**3,360**	**19.3**	**64,086**	**66.5**	**12,481**	**14.4**

Notes: N: Number of deaths attributable to tobacco; %: Percentage; ICD-10: International Classification of diseases. Tenth version; n/a: not applicable data; /a/ Cause of death excluded due to non-availability of the fourth digit in the *Sistema de Informações sobre Mortalidade (Brazil)*.
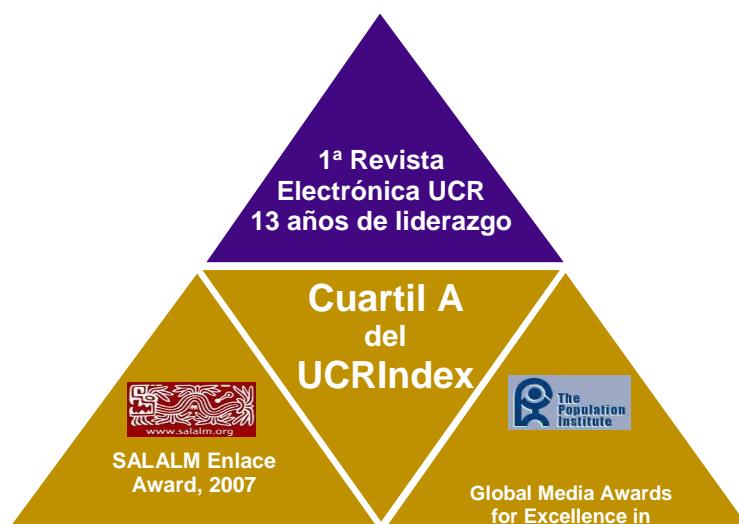
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