

ALCOHOL AND CANCER IN ITALY: ATTRIBUTABLE FRACTIONS AND TRENDS IN CONSUMPTION AND MORTALITY.

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Introduction

The harmful use of alcohol resulted in an estimated 3 million deaths (5.3% of all deaths) globally in 2016, and over 10% of deaths in the European Region were attributable to alcohol. Alcohol is strongly related to cancers of the digestive and upper respiratory tract, as well as breast cancer [1-3].

The Pattern of alcohol consumption in Mediterranean countries was historically different from the rest of the European region, high rates in the '60s and '70s have given way to major falls in consumption with a regular consumption of wine during meals rather than binge drinking with spirits and beer.

Aim

To examine the trends in cancer mortality in relation to historic trends in alcohol consumption and drinking prevalence and to quantify the cancer deaths attributable to alcohol.

Methods

We obtained official resident population and death certification data from the World Health Organization (WHO) database for the 5 major alcohol related cancer sites in Italy for the 1970-2017 period [4]. We recoded cancer deaths according to the 10th International Classification of Disease (ICD) Revision: oral cavity and pharynx (ICD codes C00-C14), oesophagus (C15), liver (C22), larynx (C32) and breast (C50) [5].

We computed age-standardised (World Population) mortality rates by sex and calendar year or quinquennium. [6]. A joinpoint regression model was used to analyze the death rate trends over the studied period [7], and calculate the estimated annual percent change (EAPC) for each trend and the average annual percent change (AAPC) [8].

Yearly pure alcohol per capita consumption data for Italy over the 1961-2018 period were obtained from the WHO European Health for All database (HFA-DB) [9]. We obtained data, for the corresponding period, on alcohol consumers and ex-consumers and abstainers from the "Istituto Superiore di Sanità".

Partial Attributable Fractions (PAF) for alcohol were calculated according to the formula [10]:

$$PAF = \frac{P_F(RR_F - 1) + \int_0^{150} P_C(x)[RR_C(x) - 1] dx}{1 + P_F(RR_F - 1) + \int_0^{150} P_C(x)[RR_C(x) - 1] dx}$$

using the continuous Relative Risk (RR) functions derived from Bagnardi et al [1].

Results

Figure 1 *top left* illustrates yearly pure alcohol consumption data in litres per capita for total, wine, beer and spirits consumption in over 15 year old Italians from 1961 to 2018. Consumption fell from about 20 litres per capita in the '70s to about 7 in 2010. Wine fell from nearly 90% in the '60s to 65% share of consumption in recent years, in favour of beer that went from 3 to 25% in the same period.

Top right illustrates the same total yearly pure alcohol consumption data by sex between 2000 and 2018 with 95% confidence bands. Female consumption was about a third that of men and followed the same trend.

Bottom left this frame shows age-standardised mortality rates per 100.000 population for alcohol related cancers in men (points) and corresponding joinpoint model (lines). All considered cancers showed descending rates both for the most recent identified segment and for the last 20 years with AAPCs from -

1.7% per annum for colorectal cancer and -3.7% per annum for laryngeal cancer. 2019 rates were highest in colorectal cancer with 13.3/100,000 men, the others being lower between 4.6/100,000 for liver and 1.6/100,000 for laryngeal cancers.

Bottom right displays the same mortality data and models for women. Only breast and colorectal cancer showed significant falls over the past 20 years with AAPCs of -1.1 and -1.7% per annum respectively. Breast and colorectal cancers also showed the highest age-standardised rates in 2019 with about 14/100,000 and 8/100,000 respectively, other cancers all had rates below 2/100,000.

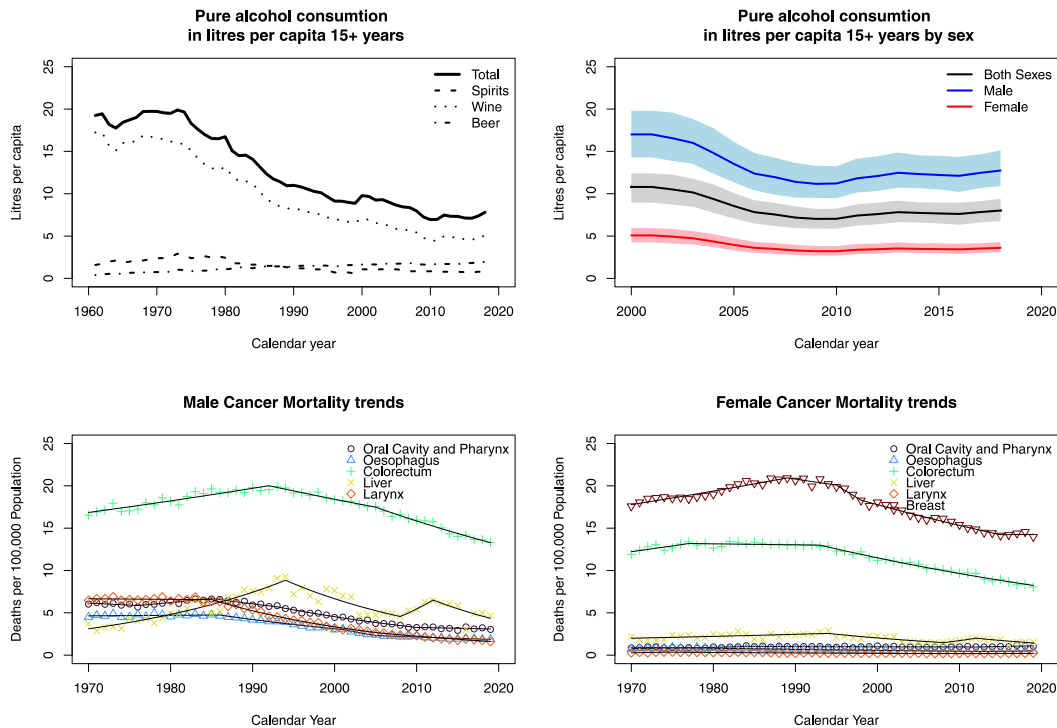


Figure 1: Top Left: Pure alcohol consumption in litres per capita at 15+ years, total wine, beer and spirits. Top right: Pure alcohol consumption in litres per capita at 15+ years, in men, women and both sexes with 95% confidence bands. Bottom left: male age-standardised mortality rates (world standard population) for alcohol related cancers (circles: oral cavity and pharynx, triangles: oesophagus, crosses: colorectum, Xs: liver, diamonds: larynx) with corresponding joinpoint models (lines), from 1970 to 2019. Bottom right: female age-standardised mortality rates (world standard population) for alcohol related cancers (circles: oral cavity and pharynx, triangles: oesophagus, crosses: colorectum, Xs: liver, diamonds: larynx, inverted triangles: breast) with corresponding joinpoint models (lines), from 1970 to 2019.

Calculated PAFs and corresponding attributable deaths were higher in men the highest being for cancers of the oral cavity and pharynx and squamous cell carcinoma of the oesophagus with 46% (980 deaths) and 49% (430 deaths) respectively in men and 15% (170 deaths) and 21% (70 deaths) in woman, however the nearly 6% PAF for female breast cancer resulted in 750 attributable deaths. Overall alcohol accounts for nearly 3% (5290 deaths) of total cancer deaths 3.8% in men and 1.9% in women.

Conclusions

The decline in alcohol consumption led to substantial declines in liver cancer and other chronic liver diseases [11, 12], as well as all major alcohol related cancers in the last decades in Italy. The influence of Alcohol reduction is evident in head and neck cancers where it has a multiplicative effect with tobacco smoking. In men these cancers all showed favourable trends, also due to the changes in tobacco consumption [13, 14].

In women the trends are not so, and in the last decade where rises for these cancers were recorded, they were probably due to patterns in tobacco prevalence. The fall in alcohol drinking is also a contributing factor to the fall in breast cancer mortality [15].

Alcohol is a major cause of cancer and other diseases, the recent lack of falls in consumption is cause for concern and should be monitored closely.

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