# Burden of Cancers Attributable to Modifiable Risk Factors in Malaysia

**ICR** MINISTRY OF HEALTH MALAYSIA *Research that matters to patients*

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## Introduction

**Burden of cancer worldwide and in Malaysia**
- Cancer is the second leading cause of death globally
- About 1 in 6 deaths is due to cancer[1]
- Cancer contributed to 9.6 million deaths worldwide and 16,000 deaths in Malaysia in year 2018.[1]

**Disease Prevention**

**Prevention strategies**
- Around one third of deaths from cancer are due to the 5 leading behavioral and dietary risks: high body mass index, low fruit and vegetable intake, lack of physical activity, tobacco use, and alcohol use
- 30–50% of cancers can currently be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies[1]

**Objective of this study**
- To identify the proportion of cancers in Malaysia that were attributable to the modifiable risk factors of overweight, alcohol intake, physical inactivity, tobacco smoking
- To estimate the number of cancer cases that could be prevented if the exposure to the modifiable risk factor was reduced

## Methodology

The quantification of the burden of cancer due to risk factors can be estimated by the Population Attributable Fraction (PAF) approach. PAF estimate is interpreted as the proportion of cases that could have been prevented if the exposure to risk factors is reduced to the ideal reference level[2].

**NHMS 2006** National Health & Morbidity Survey

**CUP Continuous Update Project** Analysing research on cancer prevention and survival

- The two parameters used for the estimation of PAF were exposure prevalence to selected risk factors(overweight, alcohol intake, physical inactivity and tobacco smoking) and the relative risk of getting the cancers given the exposure.
- Exposure prevalence (P) was taken from National Health and Morbidity Survey 2006 (NHMS 2006)[3].
- Relative risks (RR) to cancers were obtained from high quality meta-analysis in the revised Continuous Update Project (CUP) report published in 2018[4].
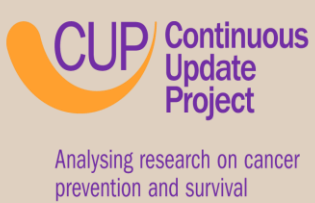
Individual and combined PAFs were calculated using the equations below:

Individual PAF= [P(RR-1)]/ [[Px (RR-1) +1]

*P = Prevalence of exposure to the risk factor in male/female total population*

*RR = relative risk of risk factor to a specific cancer subtype*

$PAF_{combined}= 1-(1-PAF_a)x\ (1-PAF_b) \times (1-PAF_c) \times (1-PAF_d)$

*$PAF_{a-d}$ = PAF due to risk factor overweight, alcohol intake, physical inactivity and tobacco smoking*

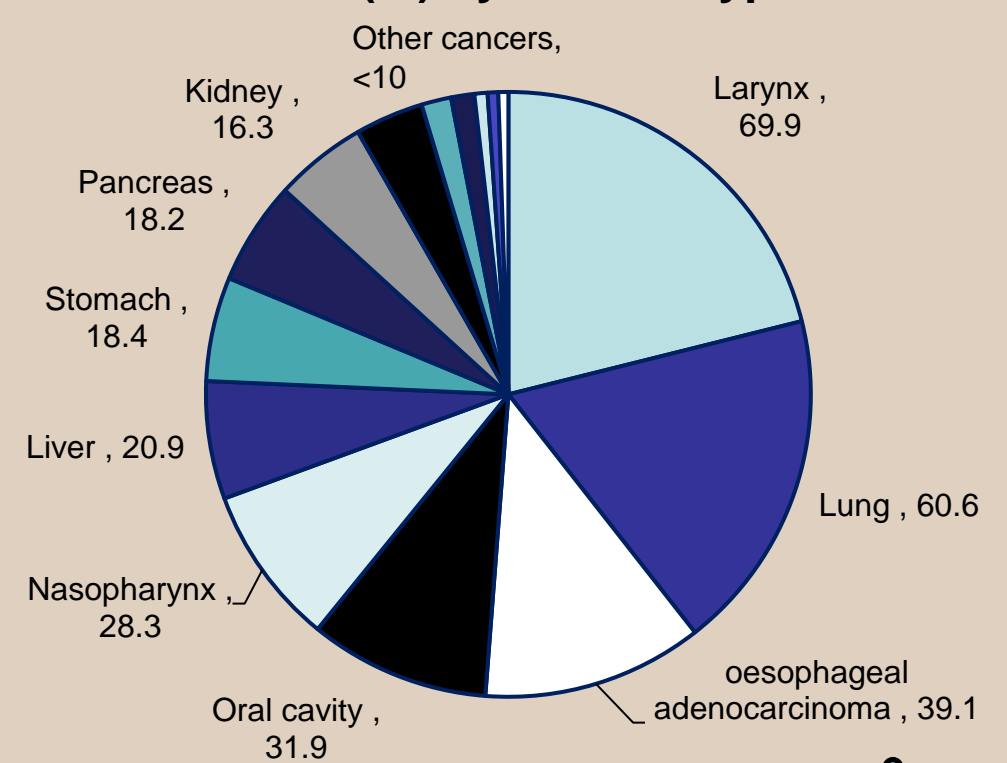**GLOBAL CANCER OBSERVATORY**

We estimated the number of cancer cases attributable to the modifiable risk factor(s) by applying the calculated combined PAFs to the cancer incidences obtained from Global Cancer Observatory (Globocan) 2018[5].

## Results



**Overall Population Attributable Fraction by Risk Factors(%)**

Overweight: 3.5 | Alcohol intake: 0.4 | Physical Inactivity: 1.8 | Tobacco Smoking: 27.9



**PAF (%) by Cancer Types**

- Other cancers, <10
- Kidney, 16.3
- Pancreas, 18.2
- Stomach, 18.4
- Liver, 20.9
- Nasopharynx, 28.3
- Oral cavity, 31.9
- oesophageal adenocarcinoma, 39.1
- Lung, 60.6
- Larynx, 69.9
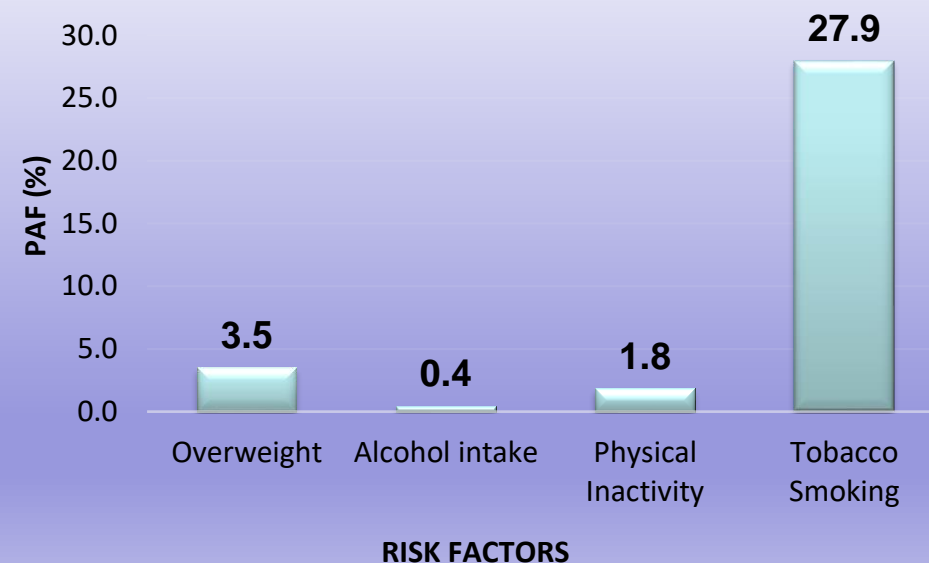
## Discussion/Conclusion

According to Malaysia National Cancer Registry report 2012-2016, the ten most common cancers among Malaysian were breast, colorectal, lung, lymphoma, nasopharynx, leukaemia, prostate, liver, cervix uteri and ovary[6]. Although breast cancers and colorectal cancers were the top cancers affecting Malaysian population, the estimated PAFs were lower (less than 10%) due to limited evidence of attribution by the studied risk factors in these two cancers. Notably, PAFs estimates would be higher if the risk factors were strongly related to these two cancers, such as red and processed meat or long term use of hormone replacement therapy. These risk factors can be considered in the future studies. Gender-specific social behaviours such as tobacco smoking explained the vast difference in overall PAF by sexes (PAF $_{male}$ = 47.1% ;PAF $_{female}$ = 2.9%)

The main factors affecting Malaysian were obesity, alcohol intake and smoking. On the contrary, physical inactivity has a lesser effect on cancers as the evidence from WCRF suggested it only increased the risk of three types of cancers in this study (colorectal, breast and endometrial). This study showed that laryngeal cancer, lung cancer and oesophageal adenocarcinoma had the highest proportion of potentially avoidable cases. The risk factor associated with these top three estimates was largely by tobacco smoking. This finding was consistent with the fractions of cancer reported by a global review done in 2016, in which more than half of the lung and laryngeal cancer were attributed by smoking[7].

As a conclusion, approximately one-fifth (18.3%) of the overall cancers in Malaysia can be prevented by adjusting the modifiable risk factors. From this study, it has re-emphasized that tobacco smoking and excess weight are the two predominant factors for cancer cases in Malaysia.

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