

Algorithm to calculate the smoking economical burden in active and passive smokers

Abstract

Introduction: The smoking consequences over health had stimulated to take decisions by the fiscal authorities to control the effect from this risk factor. Although that, the critics from tobaccos and cigarettes consumption defender about estimations way for smoking economic burden close to the relative burden of tobacco industry in the national economy for several countries had carried to insufficient control over smoking. That's why, have a guide for carry to easy and precise smoking economic burden estimation would contribute to provide strong answer to these arguments and make easier the smoking control especially since economic point of view.

Objective: Create an algorithm to calculate the smoking economical burden in active and passive smokers.

Methods: The algorithm was making according to measurement method to express the smoking economic burden like the health expense probability attributable to smoking. Were used theory methods like the inductive-deductive, the historic-logic, the analysis and synthesis and the comparative.

Results: The algorithm may obtain the smoking economic burden by a precise and easy way. The useful from this algorithm will provide a precise value for smoking economic burden in active and passive smokers. By this way, the passive smokers will be included in the estimation for the smoking economic burden.

Keywords: economic burden, algorithm, smoking

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Introduction

Because of the high cost induced by smoking in the society, many people had been agreeing in take effectives measures for a better smoking control. However, the high fiscal benefits obtained from tobacco and cigarettes consumption close to the unknown from the smoking economical burden hadn't jumped to some fiscal authorities to apply effective measures for a better smoking control.¹⁻⁶ One of the arguments utilized in that way it is directly related with the calculus way to determinate the smoking economical burden because this way use the smoking burden like equal to the relative value of smoking economical burden. This is a conceptual mistake that must be repaired because the results using this way aren't full trustable.⁷ By other hand, this way don't include the passive smokers. Then the smoking economical burden it isn't complete using this way and the fiscal authorities haven't in the smoking cost by the now way a whole tool to smoking control. Attending to this situation, the authors created a new formula to determinate the smoking economical burden and because it is a new way, was necessary provide a guide that step by step carry until determinate the smoking economical burden in active and passive smokers.⁷⁻¹³

Objective

Create an algorithm to calculate the smoking economical burden in active and passive smokers.

Methods

The theory methods used mainly were the inductive-deductive, the historic-logic, the analysis and synthesis and the comparative. The

algorithm is based in the empiric method of measurement to express the smoking economical burden like the probability of the health spends because of smoking.

Results

The algorithm is based in two main supposes. First, the total population for research will be separated in two main groups: active smokers and passive smokers, one excluded from the other. This means that all no-active smokers are considered passive smokers. Second, the morbidity causes because of smoking are the same in active smokers and passive smokers. To understand the forming process about the smoking economic burden in active and passive smoker, it is precise know the main success that are present in it. In general way, the mains successes related with smoking economic burden in active and passive smokers are identified in the following Figure 1 Like the previous graph suggest, the successes in red are related with smoking economic burden in active and passive smokers. Also, all them are mutually excludes and complementary at same time. That's why, identify or calculate the probability associated to each success in red it is full important to calculate the smoking economic burden. In this case, the use of the Theorem of Multiplication would provide the solution to determinate the smoking economic burden in active and passive smokers. Then, the algorithm suggested must provide a sequence of step according to the graph. Others research based in similar theory method had demonstrated it strong autonomy by the use of mathematic methods like the previous said. Then, in this case, the use of this methodology provide an important stronger to the algorithm.¹⁴⁻²¹

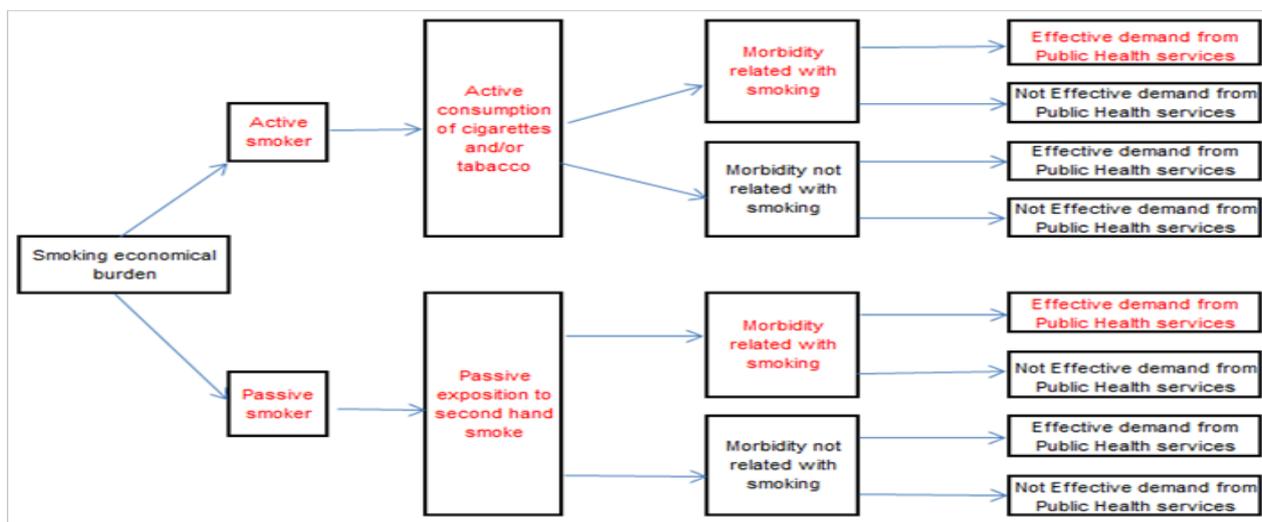


Figure 1 Like the previous graph suggest the successes in red are related with smoking economic burden in active and passive smokers.

This algorithm designed by the authors is developed by the following steps:

Step 1: Bibliographic and documental research to determinate the main morbidity causes where smoking is an important risk factor.

This step is very important to understand how impact the smoking over individual and social health in active and passive smokers and how induce this risk factor to the assignation and distribution of resources that fiscal authorities make to the Public Health.

Step 2: Identify the principal morbidities causes.

In this step the use of yearbooks should be recommended because in many cases the statistic information appears added by morbidity cause. Nevertheless, the most important is that based on the previous step, the researcher must identify the mains morbidity causes that are present in the population.

Step 3: Determinate the principals morbidity causes that are related with smoking like risk factor.

The combination of the step 1 and the step 2 in this step must provide the necessary information to select the morbidity causes that are strongly related with smoking like risk factor. That's why the good results of step 1 and 2 are manifested in this step.

Step 4: Calculate the morbidity probability's by each morbidity cause strongly related with smoking.

In this step the researcher must identify the morbidity number by morbidity cause and totalize it. By morbidity cause strongly related with smoking the probability must be calculated by the division of the number of cases identified and the total cases of morbidity.

Step 5: Determinate the full probability of morbidity strongly related with smoking.

The full probability of morbidity strongly related with smoking must be calculated like the sum of all probabilities calculated in step 4.

Step 6: Determinate the probability to have an active smoker.

The probability to have an active smoker it calculated like the division between the number of active smokers and the total population.

Step 7: Determinate the consumption by active smoker.

This calculus it make like the division between the total consumption of cigarettes or tobacco and the total of active smoker.

Step 8: Determinate the minimum consumption.

Given the concept from the authors this consumption level is the one that determinate the existence of the health spends attributable to smoking⁷. Generally it is closest related with the minimum level for moderate consumption.

Step 9: Calculate the probability of existence of health spends attributable to smoking.

This probability must be calculated like $1 - (\text{minimum consumption} / \text{total consumption})$.⁷

Step 10: Determinate the smoking epidemiologic burden by morbidity in active smokers.

This rate it is calculated like the multiplication of the probability calculated in step 5 and the probability calculated in step 6.

Step 11: Determinate the smoking economic burden by morbidity in active smokers.

This rate must be calculated by the multiplication of the smoking epidemiologic burden by morbidity in active smokers (step 10) and the probability of existence of health spends attributable to smoking (step 9).

Step 12: Determinate the exposition level to the second hand smoke.

This rate depend from two mains variables: exposition to the second hand smoke and the consumption intensity. For beginners

research could be used the probability to have a no-active smoker influenced by second hand smoke.

Step 13: Calculate the smoking economical burden in passive smokers.

This rate it calculi like the multiplication of smoking economic burden by morbidity in active smokers and the exposition level to the second hand smoke.

Step 14: Determinate the whole smoking economical burden.

This rate it is calculated like the sum of the smoking economic burden in active smokers and the smoking economic burden in passive smokers. This algorithm is a trustable way to determinate the smoking economic burden. In first place, it is based on a new formula to calculate the smoking economic burden in active and passive smokers, which one resolve the arguments from smoking defender that the now way estimating the smoking economic burden in active smoker overvalue the real. Also, this new formula includes the passive smokers' case, which the now way doesn't. In second place, the algorithm it is according to the mains success related with the existence of the smoking economic burden in active and passive smokers.

Conclusion

The algorithm suggested provides an easy way to calculate the smoking economic burden in active and passive smokers. Also, the useful from this algorithm in several contexts would carry to a more trustable result to measure the impact from smoking over the economic resources uses in the Public Health.

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None.

Conflict of interest

The authors declare that they have no conflict of interest.

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