CLINICAL RESEARCH

Estimating the Smoking Economic Burden by Morbidity

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ABSTRACT

INTRODUCTION

In the Health Economy research context usually much researches are assuming that the probability of the morbidity attributable to smoking is equal to the probability of the health spend attributable to smoking. Also is attributed the whole health spend because of active smokers to smoking. In this case researchers don´t take account that the whole active smokers health spend isn´t attributable to smoking and usually don´t consider the passive smokers role in the formation of the smoking economic burden by morbidity.

OBJECTIVE

To describe the main elements determining the smoking economic burden by morbidity.

MATERIALS AND METHOD

Was made a bibliographic research to describe the estimation process from the smoking economic burden by morbidity. Were utilized as theoretical method the analysis and synthesis, the comparative and the systematization. As empiric methods were used the Principle of Multiplication and the bibliographic research.

RESULTS

The rate designed solves the limitation identified during the research about the estimation of the smoking economic burden by morbidity.

CONCLUSION

The main elements determining the smoking economic burden by morbidity are the smokers number (active and passive), the morbidity related to smoking and the effective demand of health services attributable to smoking. The estimation of the whole smoking economic burden by morbidity depends from the appropriate consideration from these elements.

1. <u>INTRODUCTION</u>

Smoking is a market weakness witch relevancy is agreed to the smoking social impact. The effect from this risk factor over the public health carries to more spend because of the morbidity and mortality related [1].

In the health economy context frequently is utilized the illness burden (probability from the morbidity) attributable to smoking as equal to the economic burden (spends probability) attributable to smoking [2].

This limitation is given because there isn´t a defined and particular way to measure the smoking economic burden by morbidity. Because of the smoking impact over the fiscal spend by morbidity; the measurement of this burden must be a prior need from the fiscal authorities around the world [3].

Smoking is consequence from the consumption of cigarettes and tobaccos [4]. The smoking impact over the public health services demand´s means an opportunity cost that may cause a strong pressure over the financial fiscal management because of the induced need to increase the consumption of materials and equipment covering the health service demand added because of smoking [5].

People agree to cigarettes and tobacco consumption argument that smoke is a personal decision. However, this position don´t take account the real addiction to nicotine across the tobacco consumption, including in lowest consumption level [6].

Also it makes reference to social benefits related to the real available of employment from the tobacco industry [7]. However, these arguments don´t consider the social and economic damages because of the labor productivity lose attributable to smoking [8].

It is supported that earlier smoker death carries to fiscal save because of the effective reduction of retirement payments too [9]. Nevertheless, this position don´t takes account the whole past costs assumed socially because of the cigarettes and tobacco consumption [10].

The knowledge of the smoking economic impact may account the relative and absolute burden from smoking over the economy. Also, it is a main element to determine the cost - benefit relation as base for an appropriate economic policy to reduce the smoking impact over the morbidity and mortality too [11,12].

The effective accounting from the smoking social costs must be over fact determination of the cost - benefit relation. Also must be a reference for a better valuation from the social costs attributable to smoking [13].

WHO is agreed to increase tax closest to the tobacco and cigarettes consumption to reduce it given that usually tobacco and cigarettes behavior is agree to ordinaries and necessaries goods [14,15].

By this way it reinforces the role of the knowledge about the smoking economic burden for the public health and the society in general because of this knowledge support the smoking economic control across the respective economic policy [16].

The estimation of the smoking economic burden by morbidity may be by two main ways. One of them is using the standardized costs agree to the illness protocol. This method is often used in a reduced context because the generalization in larger population isn´t feasibility. However, many researchers who had used this method had equaled the health spend because of active smokers to the health spend because of smoking. This analysis supports the idea that the whole health spend because of active smokers is attributable to smoking [17-28].

The other method looks to determine the expected value from the public health spend attributable to smoking and is more utilized as a base to develop economic policies for the smoking control. This is the method of the economic burden by morbidity. Also is the main reason from this research [29].

Researchers who had utilized this method estimating the smoking economic burden by morbidity had equaled the expected health spend because of active smokers to this rate. This analysis supports the idea that the whole health spend because of active smokers is attributable to smoking too. In all case, researchers need understand that the whole active smoker health spend isn´t attributable to smoking and from the no-smoker health spend a part is attributable to smoking too. That is why it is important to appoint the main elements determining the smoking economic burden by morbidity.

The previous arguments suggest the need to describe the main elements determining the smoking economic burden by morbidity. That is the main objective from this research.

2. <u>OBJECTIVE</u>
To describe the main elements determining the smoking economic burden by morbidity.

3. <u>MATERIALS AND METHOD</u>
Was made a bibliographic research to describe the estimation process from the smoking economic burden by morbidity. Were utilized as theoretical method the analysis and synthesis, the comparative, and the systematization. As empiric methods were used the principle of multiplication and the bibliographic research.

4. <u>RESULTS</u>
The illness burden is an epidemiologic concept to measure the illness impact over the population researched. In relative terms is equivalent to the probability of the morbidity in the researched population. The illness burden analysis includes the illness economic burden too. This term is equivalent to the spend probability attributable to the researched illness [30].

The smoking economic burden by morbidity measures the health services consumption attributable to smoking [31-33]. Then, the existence of the smoking burden by morbidity is a necessary but not a sufficient condition for the existence of the smoking economic burden by morbidity. Since an economic point of view, the smoking

burden by morbidity represent the potential demand of health services attributable to smoking while the smoking economic burden by morbidity represent the effective demand of health services attributable to smoking [34,35]. By this reason it deducts that the smoking economic burden by morbidity is always less than the smoking burden by morbidity. That is why researches that use both terms as equals are over valuating the smoking economic impact over the health services consumption because of active smokers. This argument shows the real need of remake the rate to measure the smoking economic burden by morbidity.

Examples of those research had been developed by Pichón-Riviere and other authors in 2016 for a small group of Latin American countries [36]. Also, Ariel Barchad [37], Isaranuwatchai [38], Lightwood y Glantz [39], Sung Max [40] had developed similar research and in all case, authors assume that the whole active smoker health spend is attributable to smoking.

Implicitly these research deduct that smoking is limited to the present tobacco consumption without consider the intensity of that consumption and the relation between the accumulative effect from smoking, the morbidity related to smoking and the smoking economic burden by morbidity [41-44].

By other hand, the method utilized until now estimating the smoking economic burden by morbidity don´t include the passive smokers. Passive smoking is a consequence from the active smoking, and both are determined by the consumption of cigarettes and tobaccos. Passive smokers don´t generate fiscal income by the direct consumption of cigarettes and tobaccos but carry to increase the health spend agree to tobacco exposition [45,46].

The economic burden attributable to some risk factor is determined by the simultaneous existence of three independents successes: the existence of somebody affected by the risk factor, the existence of the morbidity related to the risk factor and the effective demand of health services attributable to the risk factor [47].

Each of them is related to an existence probability. According to the Principle of Multiplication, if some success A is given by the simultaneous happening of some successes, then, the probability from the existence of the success A is equal to the multiplication of probabilities from each success determining the existence of success A. This argument is the base for the analytic conception for the new rate to estimate the smoking economic burden by morbidity. Then, the smoking economic burden by morbidity must be equal to the multiplication of probabilities from all successes determining it existence [48].

All tobacco consumption is damaging health agree to the tobacco consumption intensity. Then, the illness burden by smoking is proportional to the tobacco consumption [49]. However, the smoking economic burden is also determined by the effective demand of thealt services attributable to smoking. At same time, the effective demand only occurs when the smoker patient sicked from some morbidity cause related to smoking receive some health service related to smoking too. In consumption terms, there is a distance between the illness burden by smoking and the smoking economic burden by morbidity given by the minime tobacco consumption determining the existence of the effective demand of health services attributable to smoking [50].

However, there is a proportional direct relation between the tobacco consumption moreover than that minimum consumption and the smoking economic burden by morbidity. As result, the difference between the illness burden by smoking and the smoking economic burden by morbidity will be closing while the tobacco consumption is growing too [51-55].

The rate measuring the smoking economic burden by morbidity must be agreed to the following elements:

1) Acknowledge that only apart from the illness burden attributable to smoking is the smoking economic burden attributable to smoking agree to the effective demand of health services attributable to smoking too.
2) Acknowledge the main place from the tobacco active consumption in the formation of the smoking economic burden by morbidity.
3) Acknowledge the social and individual responsibilities from no-active smokers demanding the existence of whole place free from tobacco smoke.
4) Acknowledge the relevancy from the illness burden attributable to smoking in the formation of the smoking economic burden by morbidity.

However, the most important significance must be given by differentiating between:

a) The smoking economic burden by morbidity and the illness burden attributable to smoking.
b) The health spends because of active smokers and the health spend attributable to smoking.

These differentiations only would be possible acknowledging the main role from the effective demand of health services attributable to smoking in the formation of the smoking economic burden by morbidity.

5. CONCLUSION

The main elements determining the smoking economic burden by morbidity are the smoker's number (active and passive), the morbidity related to smoking and the effective demand of health services attributable to smoking. The estimation of the whole smoking economic burden by morbidity depends on the appropriate consideration from these elements.

REFERENCES

1. Fernández Hernández F and Sánchez González E (2020) The smoking economic burden in the National institute on oncology and radiology from Cuba. Journal of Physical Medical & Rehabitation Studies & Report 2(2): 1-3.
2. Guerrero-López CM, Muños-Hernández JA, Sáenz de Miera-Juárez B et al. (2013) Tobacco use, mortality and fiscal policy in Mexico. Public Health of Mexico 55: S276-S281.
3. Guerrero-López CM, Reynales-Shigematsu LM, Jiménez-Ruiz JA et al. (2012) Absenteeism costs attributable to tobacco use in the Mexican institute of social security and in Mexico, 2006-2009. Mexico Public Health 54: 233-241.
4. Hernández FF and González ES (2020) The smoking epidemiologic control across the primary health service. Asclepius Medical Research and Reviews 3(2): 1-3.

5. Fernández Hernández F and Sánchez González E (2021) The macro-social smoking control. Asclepius Medical Research and Reviews 4(1).

6. Fabelo Roche J, Lorenzo Vázquez EL, Iglesias Moré S et al. (2019) Impact of health warnings on cigarette packs on Cuban smokers. Health & Society 9: 306-313.

7. Sánchez González E and Fernández Hernández F (2021) Brief analysis about the smoking economic benefits. Medical Journal of Clinical Trials & Case Studies 5(2): 000282.

8. Hernández FF and González MES (2020) Smoking incidence over the labor health. Journal of Medical Care Research and Review 3(8): 417-419.

9. Cabrera AR, González AMG, Vázquez LA (2019) Economic aspects of demographic aging and its importance for decision-making in the health sector. The Cuba case. Infodir (Information Magazine for Health Management) 15(28): 13-27.

10. Hernández FF (2021) The absolute socioeconomic inequity attributable to smoking. Journal of Medical Care Research and Review 4(5).

11. Sánchez González E and Fernández Hernández F (2017) The role of tax authorities in tobacco control. Journal of Medical Sciences of Pinar del Río 21(3): 62-67.

12. García AP, Gálvez MGE, Friera EC et al. (2016) Smoking: Values and integrity. Electronic Medical Journal 38(3): 460-469.

13. Selvaraj S, Srivastava S, Karan A (2015) Price elasticity of tobacco products among economic classes in India, 2011-2012. BMJ Open 5(12): e008180.

14. Abascal W and Lorenzo A (2017) Impact of the tobacco control policy in the adolescent population in Uruguay. Mexico Public Health 59: 40-44.

15. Arredondo A, Recaman AL, Pinzon C et al. (2018) Financial consequences from smoking-related diseases in middle-income countries: Evidence and lessons from Mexico. The International Journal of Health Planning and Management 33(2): e454-e463.

16. Sánchez González E and Fernández Hernández F (2020) The fiscal policy and the smoking control in Cuba. Journal of Clinical Research and Reports 2(4): 1-4.

17. Hernández FF and González ES (2020) The social and economic inequity from smoking in Cuba. Annals of Medical & Surgical Case Report 2(02).

18. Hernández FFHF and González ES (2019) Impact of smoking on the Cuban health budget 1997-2014. Journal of the Psychiatric Hospital of Havana 14(2).

19. González ES and Hernández FF (2019) General economic characterization of cigarette consumption in Cuba from 2011 to 2013. Revista del Hospital Psiquiátrico de La Habana 14(2).

20. EfraÃn SÃ (2020) Contributions since the health economy research to the smoking control in Cuba. Biomedical Journal of Scientific & Technical Research 30(1): 23102-23104.

21. González ES and Hernández FF (2020) Brief appointments about fiscal policy for the smoking control. Journal of Clinical Research and Reports 2(5).

22. Sánchez González E and Fernández Hernández F (2019) The smoking fiscal space in Cuba. Journal of Clinical and Medical Research 1(3): 1-5.

23. Gonzalez ES and Hernández FF (2018) The relationship between tax policy and tobacco control in Cuba. Holguín Medical Scientific Mail 22(2): 238-249.

24. https://files.sld.cu/dne/files/2018/04/Anuario-Electronico-Espa%c3%b1ol-2017-ed-2018.pdf

25. Ferrer Tan IJ, Ferrer Herrera IM, Oliva García NR et al. (2002) Cuban study on tobacco or health: Characterization in a health area. Camagüey Medical Archive Magazine 6(4): 323-331.

26. Jiménez YS and Acuña TM (2016) Tobacco use in Costa Rica, relationship with multiple pathologies and importance of smoking cessation. Medical Journal of Costa Rica and Central America 73(619): 285-289.

27. https://temas.sld.cu/tabaquismo/temas/regulaciones-vigentes-para-el-control-del-tabaquismo-en-cuba/

28. (2019) Statistical yearbook of Cuba.

29. Fernández Hernández F and Sánchez González E (2019) The economic burden of smoking - quantifying the tangible direct costs of smoking. Spanish Academic Editorial.

30. Seuc AH and Domínguez E (2005) About calculating the burden of disease due to morbidity. Cuban Journal of Hygiene and Epidemiology 43(3).

31. Paredes Díaz R, Orraca Castillo O, Marimón Torres ER et al. (2015) Influence of smoking and alcoholism on the health status of the population of Pinar del Río. Journal of Medical Sciences of Pinar del Río 19(1): 46-55.

32. Castillo N, Malo M, Villacres N et al. (2017) Methodology for estimating direct costs of comprehensive care for non-communicable diseases. Peruvian Journal of Experimental Medicine and Public Health 34(1): 119-125.

33. Hernández FF and González ES (2018) Algorithm to calculate the smoking economical burden in active and passive smokers. MOJ Toxicology 4(6): 373-375.

34. Hernández F and González ES (2019) Estimating the economic burden attributable to some risk factor. Journal of Clinical Investigation and Studies 2: 1-2.

35. Pérez PV, Roche GG, Fogarty AW et al. (2015) Mortality from lung cancer and ischemic heart disease attributable to passive smoking in Cuba-2011. Cuban Journal of Hygiene and Epidemiology 53(2).

36. Pichon-Riviere A, Bardach A, Augustovski F et al. (2016) Economic impact of smoking on health systems in Latin America: A study in seven countries and its extrapolation to the regional level. Pan American Journal of Public Health 40: 213-221.

37. Bardach AE, Caporale JE, Alcaraz A et al. (2016) Burden of smoking disease and potential impact of the increase in cigarette prices in Peru. Peruvian Journal of Experimental Medicine and Public Health 33: 651-661.

38. Isaranuwatchai W, de Oliveira C, Mittmann N et al. (2019) Impact of smoking on health system costs among cancer patients in a retrospective cohort study in Ontario, Canada. BMJ Open 9(6): e026022.

39. Lightwood J and Glantz SA (2013) The effect of the California tobacco control program on smoking prevalence, cigarette consumption, and healthcare costs: 1989-2008. PloS One 8(2): e47145.

40. Max W, Sung HY, Shi Y et al. (2016) The cost of smoking in California. Nicotine & Tobacco Research 18(5): 1222-1229.

41. Cuéllar Álvarez J (2017) Diagnostic characterization for the prevention of tobacco addiction in adolescents characterization diagnostic for the prevention of the addiction to the tobacco in adolescents. Cuban Journal of Health Technology 2017 8(4): 1-7.

42. Rojas Ochoa F (2017) Reconciling priorities between health and the economy. Cuban Journal of Public Health 43: 461-462.

43. Izquierdo Díaz R, Ochoa Ortega MR, Casanova Moreno MDLC et al. (2015) Smoking and its educational prevention in the population of a medical office. Journal of Medical Sciences of Pinar del Río 19(4): 642-651.

44. Jha V, Narayanan BG, Wadhwa D et al. (2020) Economic and environmental effects of reduction in smoking prevalence in Tanzania. Tobacco Control 29(1): 24-28.

45. Hirono KT and Smith KE (2018) Australia's $40 per pack cigarette tax plans: The need to consider equity. Tobacco Control 27(2): 229-233.

46. Valdivia G (2017) Tobacco use: Some epidemiological antecedents. Chilean Journal of Respiratory Diseases 33 (3): 176-179.

47. Toledo Curbelo GJ (2008) Public health fundamentals. 2nd (Edn)., La Habana: Ciencias Médicas: 184-186.

48. Mateos G, Morales A (2002) History of probability (from its origins to laplace) and its relationship with the history of decision theory. History of Probability and Statistics/AHEPE: 1-18.

49. Wamamili BM and Garrow AP (2017) Have higher cigarette taxes in the United States discouraged smoking? A review of data from 1999-2013. Tobacco Prevention & Cessation 3.

50. Cher BP, Chen C, Yoong J (2017) Prevalence-based, disease-specific estimate of the social cost of smoking in Singapore. BMJ Open 7(4): e014377.

51. Hernández FF and González ES (2017) Epidemiological burden vs. economic burden of smoking due to morbidity. Journal of Medical Sciences of Pinar del Río 21 (2): 210-216.

52. Gonzalez ES and Hernandez FF (2019) A view for the morbidity attributable to smoking since the microeconomic. Trends in Research 2.

53. Delaney L (2017) The impact of smoking on healthcare provision. International Journal of Nursing & Clinical Practices 4: 258.

54. Buettner-Schmidt K, Miller DR, Maack B (2019) Disparities in rural tobacco use, smoke-free policies, and tobacco taxes. Western Journal of Nursing Research 41(8): 1184-1202.

55. Galiano Ramírez MDLC (2017) Smoking in childhood and adolescence: An addiction, a challenge. Cuban Journal of Pediatrics 89(4): 1-5.