

# TAXATION AND LIFE EXPECTANCY IN WESTERN EUROPE

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## SUMMARY

*With the exception of Denmark, life expectancy in Western Europe has shown a significant increase over the last decades. During that period of time overall taxation has increased in most of the countries, especially in Denmark. We, therefore, examined whether taxation could influence life expectancy in Western Europe. We used information on the sum of income tax and employees' social contribution in percentage of gross wage earnings from the OECD database and data on disability adjusted life expectancy at birth from the World Health Organization database. We arbitrarily only included countries with populations in excess of 4 millions and thereby excluded smaller countries where tax exemption is part of the national monetary policy. We found that disability adjusted life expectancy at birth was inversely correlated to the total tax burden in Western Europe. We speculate whether a threshold exists where high taxes exert a negative influence on life expectancy despite increased welfare spending. The study suggests that tax burden should be considered among the multiple factors influencing life expectancy.*

**Key words:** life expectancy, taxation, Western Europe

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## INTRODUCTION

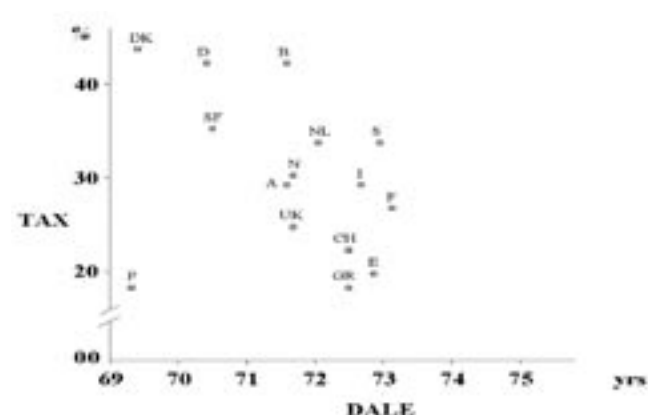
During the last 50 years income per capita has shown a steady increase in Western European countries. During that period of time diversities between the countries with regard to culture, education, political systems, health care, and distribution of wealth have continued to diminish (1). Overall taxation has increased in most of these countries to finance the increased welfare spending (2). Simultaneously with the increase in welfare life expectancy has increased (1,3). However, in Denmark, a country with one of the highest per capita income, the increase in survival rate has been less dramatic and life expectancy now approaches the lowest in Western Europe (3). At the same time, tax burden in Denmark exceeds that in the other European countries (2). To examine the possibility that tax burden may influence survival rate we related overall taxation to life expectancy in Western Europe.

## MATERIAL AND METHODS

World Health Organization data on disability adjusted life expectancy (DALE) at birth (male + female) (3) were related to the sum of income tax and employees' social contribution in percentage of gross wage earnings in Western European countries with populations in excess of 4 millions (2). Countries with populations of less than 4 million inhabitants were not included in this analysis since in some of these countries tax rates are kept artificially low as part of the national monetary policy, and taxation is therefore not influenced by the same regulations as in the larger countries. The use of DALE is an attempt to combine data on mortality and morbidity (3). The Spearman test was used in the search for correlation.

## RESULTS

An inverse correlation was found between DALE and overall taxation in Western European countries (Fig. 1). The relationship between DALE and taxation seems fairly linear with respect to 14 of the countries ( $r=-0.66$ , two-tailed  $P=0.006$ ). Including Portugal, an outlier among the countries in this comparison, weakened this relationship ( $r=-0.36$ ,  $P=0.18$ ). Denmark and Germany are among the highest ranking countries with respect to gross wage



**Fig 1.** Relationship between disability adjusted life expectancy (DALE) at birth and the sum of income tax and employees' social security payment in percentage of gross wage earnings in Western European countries with populations in excess of 4 millions. A – Austria. B – Belgium. CH – Switzerland. D – Germany. DK – Denmark. E – Spain. F – France. GR – Greece. I – Italy. N – Norway. NL – The Netherlands. P – Portugal. S – Sweden. SF – Finland. UK – United Kingdom.

earnings in Western Europe (2). In this respect, Portugal is at the bottom of the list.

## DISCUSSION

There is ample evidence that material welfare is of fundamental importance for longevity (1). Portugal, ranked bottom in Western Europe with respect to both gross wage earnings and DALE (2,3), has probably yet to benefit from the increasing welfare. It seems contradictory that European countries with the highest per capita income (Denmark and Germany) are among those with the lowest DALE. However, the fact that these countries also have the highest overall taxation rate (Fig. 1) raises the question whether a threshold exists where high taxes exert a negative influence on life expectancy despite increased welfare spending. This could result in the curve bending towards the left at the highest taxation rates (i.e. a small increase in taxation causes a dramatic fall in life expectancy, Fig. 1). Before being able to answer this question other factors influencing survival must be taken into account. Several studies have tried to explain the "Danish paradox". Thus, it seems that the lower life expectancy in Denmark as compared with other European countries is mainly caused by a higher mortality rate in the 35-74 year age group (4). This is an age group most likely to be affected by the consequences of heavy taxation. The excess Danish mortality occurred mainly among patients with heart disease and 'symptoms and ill-defined conditions' (4). There was no evidence that inadequacy of the health care system played a significant role in the stagnating life expectancy (5).

One of the explanations for the lower Danish life expectancy has been attributed to a high prevalence of smoking among Danish women as compared to women from other European countries (6). Smoking increases mortality from cardiovascular diseases and chronic obstructive lung disease and cancer (4, 7). Also, a relatively high alcohol consumption in Denmark at least compared to some of the countries in the northern part of Europe have resulted in increased mortality from liver cirrhosis among men in this country (4). In this respect, it is not unreasonable to believe that increased alcohol intake and smoking at least in part could be related to high levels of stress.

The main function of taxes is to fund public services and to redistribute income. As depicted in the figure some countries are approaching the 50% taxation mark. Consequently, the overall disposable income is reduced. As a result, some people will increase their work-load in order to increase net income. At some point, taxation could reach a level where almost all of the income is redistributed and personal responsibility is taken away. As chronic work stress and loss of personal control have been associated with ill health outcomes (including coronary artery disease) we speculate if these factors could play a role for the relatively low life expectancy in the highly taxed countries (8-11).

## LIMITATIONS AND CONCLUSION

Reporting of data to the OECD and WHO does not occur simultaneously from the various countries. Despite of this, a few years of disparity in the data reporting between these countries would not be expected to have any major influence on the overall finding in this report. Population mortality rates in different countries are caused by a multitude of more or less well-known factors, interaction between these factors and influenced by geographical, cultural, and socio-economic variables, which we did not take into account (1). Furthermore, the finding of an association between DALE and taxation does not prove causality. The study suggests, however, that level of taxation should be considered among the factors to assess longevity in a society. Finally, it is intriguing that some of the richest Western European nations (with respect to income per capita) have the highest taxation rates, and are among countries with the lowest life expectancy.

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