Modest population-wide weight loss could result in reductions in Type 2 diabetes and cardio disease

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A paper published today in *BMJ* suggests a strong association between population-wide weight change and risk of death from type 2 diabetes and cardiovascular disease.

Variation in the prevalence of type 2 diabetes across populations can be largely explained by obesity. However, it is unclear as to what extent weight loss would lower cardiovascular disease prevalence.

Whole population trends in food consumption and transportation policies linked to physical activity could reduce the burden of type 2 diabetes and cardiovascular disease at the population level.

Following the Cuban economic crisis of the early 1990s, food and fuel shortages resulted in a decline in dietary energy intake and large increases in physical activity. This resulted in an average population-wide weight loss of 4-5kg (8-11lbs). Rapid declines in death rates from diabetes and coronary heart disease were subsequently observed.

Comparing disease rates over time can demonstrate the power of prevention and help identify key risk factors.

An international team of researchers from Spain, Cuba and the US (led by Dr Franco, associate professor at University of Alcalá) therefore examined the association between population-wide body changes and

diabetes incidence (the number of new individuals who contract a disease), prevalence (the total number of cases in a particular period of time) and death rates from type 2 diabetes and cardiovascular disease, cancer and all-causes in Cuba between 1980 and 2010. Cuba is a country with a long tradition of public health and cardiovascular research which provided the necessary data from national health surveys, cardiovascular studies, primary care chronic disease registries and vital statistics over three decades. The Cuban population is relatively homogeneous and has undergone large social and economic changes directly related to food consumption and physical activity from 1980 through 2010.

Four population-based cross-sectional surveys were used and data were available on height, weight, energy intake, smoking and physical activity. All participants were aged between 15 and 74.

Population-wide changes in energy intake and physical activity were accompanied by large changes in body weight: between 1991 and 1995 there was an average 5kg reduction, whereas between 1995 and 2010 a population-wide weight rebound of 9kg was observed.

Smoking prevalence slowly decreased during the 1980s and 1990s and declined more rapidly in the 2000s. The number of cigarettes consumed per capita decreased during and shortly after the crisis.

Diabetes prevalence surged from 1997 onwards as the population began to gain weight. Diabetes incidence (new cases) decreased during the weight loss period but then increased until it peaked in the weight regain years.

In 1996, five years after the start of the weight loss period, there was an abrupt downward trend in death from diabetes. This lasted six years during which energy intake status gradually recovered and physical activity levels were reduced. In 2002, death rates returned to pre-crisis

trends and a dramatic increase in diabetes death was observed.

Regarding CHD and stroke death trends we can see a slow decline from 1980 to 1996 followed by a dramatic decline after the weight loss phase. These descending trends have halted during the weight regain phase.

The researchers conclude that the "Cuban experience in 1980-2010" demonstrates that within a relatively short period, modest weight loss in the whole population can have a profound effect on the overall burden of diabetes and deaths from cardiovascular disease. They say that although findings show that a 5kg population-wide weight loss "would reduce diabetes mortality by half and CHD mortality by a third", these findings are an extrapolation from this one experience – nonetheless they provide a "notable illustration of the potential health benefits of reversing the global obesity epidemic".

In an accompanying editorial, Professor Willett from the Harvard School of Public Health says that Franco and colleagues "add powerful evidence that a reduction in overweight and obesity would have major population-wide benefits". He also says that authors are appropriately cautious in their conclusions and avoid "attributing all the changes in disease rates to changes in weight". He adds that physicians can help promote healthy behaviour by "visibly engaging in healthy behaviour".

Dr Franco summarises the findings in a video. Dr Franco explains how population science can give us the tools to combat diseases such as cardiovascular disease and diabetes and how tackling unhealthy diet and physical inactivity can reduce the disease burden. He also stresses the importance of promoting physical activity, including cycling and walking, as a means of transportation.

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