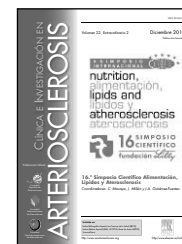




## CLÍNICA E INVESTIGACIÓN EN ARTERIOSCLEROSIS

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### 16.º SIMPOSIO CIENTÍFICO ALIMENTACIÓN, LÍPIDOS Y ATHEROSCLEROSIS

## Dietary patterns, food composition and chronic disease

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### Introduction

The hypothesis of this presentation is that the recent and almost singular negative emphasis on the role of food components and the food industry as the cause of chronic disease rather than on a "Whole-of-Society" approach to prevention and management of chronic disease within a population is unproductive. In most countries, food guides and dietary guidelines are formulated based on the premise that reduced chronic disease will be apparent in the target population. Yet international cardiovascular disease (CVD) statistics provide an obvious challenge to these assumptions. For example, Canadians have a Western dietary pattern but die from CVD deaths at a rate 25% less than Americans, with a similar dietary pattern. Canadians have CVD death rates similar to Japan, France, and Spain, countries with very different dietary patterns and eating behaviours. Clearly, research aimed at understanding the complex associations among food production, food supply, food behaviour and the economic and physical health of the population within countries is required in order to reduce the burden of chronic disease. In addition, more research is needed to understand the physiologic functionality of food and food components, beyond their nutrient contributions.

### Dietary patterns, food composition and chronic disease

Dietary patterns and food composition vary greatly among countries with similar prevalence of chronic disease. Yet dietary guidelines for the public are characterized by an assumption that there is a universal characteristic of the

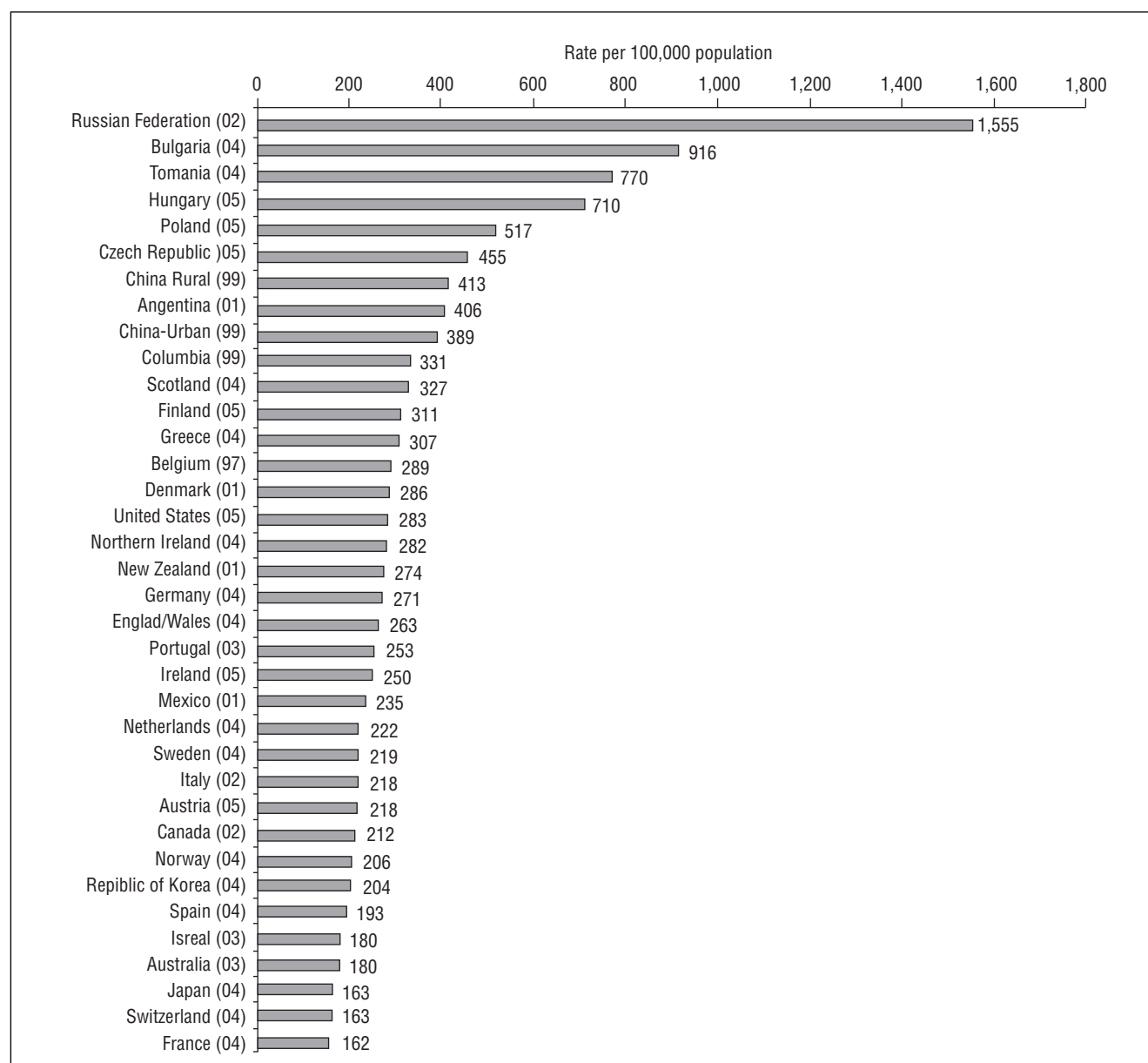
food supply that explains the prevalence of chronic disease. Many negative characteristics are emphasized as motivational guidance to encourage a change in food selection. The negative guidance approach has gained considerable momentum as a result of the rapid prevalence in obesity in the past 35 years. As a result, and in contrast to the historic partnerships of the past, a polarization between the health care and agri-food systems has emerged. The agri-food system has been marginalized as a partner in developing solutions for prevention of chronic disease. The complex associations among food production, food supply, food behaviour and the economic and physical health of the population within countries has been ignored in preference for immediate and untested solutions to the obesity "epidemic".

Obesity has become a global pandemic with the greatest prevalence in industrialized countries. The United States leads the way with almost 40% of their population obese<sup>1</sup>. The composition of the food supply is blamed for excessive intakes of high fat, sugar and salt, for being nutrient poor, highly processed, and in the Western Dietary Pattern. However, this recent and almost singular negative emphasis on the role of food components and the food industry as the cause of obesity is clearly unproductive as evidenced by the continued rise in obesity. Dietary guidelines<sup>2</sup> aimed at providing the public with advice on foods to reduce and foods to increase in their diets first appeared in the US and Canada in the 1970's. The US is mandated by law to issue new dietary guidelines every five years. Concurrently, obesity continues to increase, for the simple reason that excess energy intake, but not composition, is the strongest correlate with increased BMI in the population<sup>3</sup>.

Health economists have concluded that agriculture and the food industry have contributed 50%–70% of the advances in health and economic status of nations since the industrial revolution due to advances at the farm level for production, food processing, nutrition, food distribution and food

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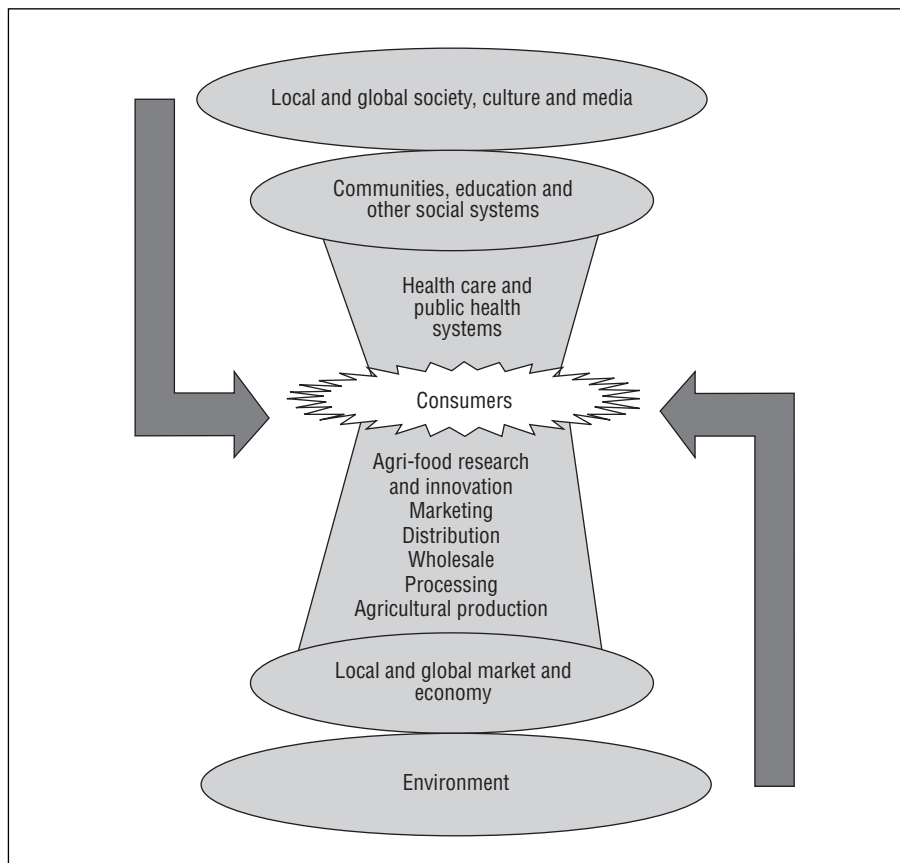


**Figure 1** Death rates for total cardiovascular disease (CVD) deaths in men ages 35-74 from selected countries (most recent year available)<sup>7</sup>.

safety<sup>4</sup>. However, in the late 20<sup>th</sup> century the food supply became judged to be the singular cause of premature morbidity and mortality whereas the health care industry moved forward to become the exclusive custodian of health. Unfortunately, the financial rewards of medicine are based on a business model that depends on treatment and not prevention. Yet, chronic diseases, such as CVD, diabetes and cancers, are recognized to be in large part preventable through modification of lifestyle factors, of which diet is only a part. For example, the European Prospective Investigation into Cancer and Nutrition (EPIC) Study found that participants that adhering to 4 simple lifestyle factors at baseline, such as never smoked, body mass index (BMI) lower than 30 kg/m<sup>2</sup>, involved in 3.5 h/wk or more of physical activity and higher intake of fruits,

vegetables, whole grains and lower meat consumption, had a 78% lower chance of developing a chronic disease (93% lower risk for diabetes, 81% lower for myocardial infarction, 50% lower for stroke and 36% lower for cancer) compared to participants who followed none of the lifestyle factors over 8 years<sup>5</sup>.

Public health messages to the consumer on food and nutrition are based on dietary patterns believed to be effective for prevention of chronic disease. In most countries they contain similar messages aimed at reducing fat, salt and added sugars while increasing intake of fruits, vegetable and dairy products<sup>2</sup> and assumes that significant reduction in chronic disease will occur in the target population. Although the Mediterranean Diet, characterised by generous amounts of fruits and vegetables, seafood,



**Figure 2** The whole-of-society systems driving food supply and consumer demand<sup>13</sup>.

olive oil and inclusion of small amounts nuts and red wine, is promoted for its association with reduced risk of heart disease<sup>6</sup>, it is clearly not the only responsible solution for many countries. Not all countries can produce or have accessibility to many foods typical of the Mediterranean Diet, and in isolation of many factors, it is not necessarily the only solution to lower prevalence of chronic disease in many countries as indicated by international CVD statistics (Fig. 1)<sup>7</sup>. For example, Canadians have a Western dietary pattern but have age adjusted CVD death rates for 35-74 year olds that are 25% less than Americans. Canadians also have a much lower CVD death rate than Greece and have similar rates to Japan, France, and Spain, countries with very different climates, health care systems, cultures, dietary patterns and eating behaviours. Although the relatively low rates of CVD deaths are present in Canadians, whom are 35-75 years of age and consuming what is described as the Western dietary pattern, composition of the food supply is different from that of Americans and illustrates the potential of engaging agriculture research in prevention of chronic diseases. Because of an adverse northern climate, agriculture research has produced crops that are uniquely adapted to the Canadian environment. For example, Canada has developed crops containing heart healthy oils including those from canola (high in monounsaturated fatty acids and alpha-linolenic acid)<sup>8</sup> and flax (high in alpha-linolenic acid)<sup>9</sup>, and produces pulses<sup>10</sup> which have significant health advantages but do not grow well in warmer climates. Indeed it has been

suggested that Americans would achieve healthier fatty acid balances in their diets by switching from soy and corn oil to canola oil<sup>8</sup>. In addition, breeding, farming and processing have produced leaner meats and low fat milk products, which have been shown to associate with healthier body weights<sup>11</sup>.

Another example of initiatives to promote and take advantage of local food availability and dietary pattern is the New Nordic Diet which is designed to promote foods and research on the health advantages of foods produced within the Nordic region<sup>12</sup>. The University of Copenhagen has launched a 5 year multi-level project that enlists the help of experts in nutrition gastronomy, consumer organizations, sociology and economics and top Nordic chefs to drive the new Nordic cuisine movement to reduce chronic disease.

Clearly agriculture and the food industry is not the evil to avoid, but rather to be embraced as a powerful ally in achieving the changes needed to combat obesity, and chronic disease by harnessing their power of innovation, technology, and logistics<sup>13</sup>. A "Whole of Society" approach, defined as a multi-level multi-stakeholder partnership approach, would engage the whole agri-food value chain that connects the producer to the consumer to achieve healthier populations (Fig. 2)<sup>13</sup>. This approach is designed to take into account the broader cultural and environmental context at local and global levels to move the supply and demand toward health and nutrition in a convergent and sustainable manner.

## Conclusion

To move toward a prevention model to reduce the burden of chronic disease a greater understanding is required of the complex associations among food production, food supply, food behaviour and the economic and physical health of the population. More research is needed to understand the physiologic functionality of food and food components produced and available within a country on the health of its population. Partnerships from all sectors need to be created. Health and agriculture and agri-food systems should not be allowed to operate in isolation from each other if effective solutions to prevention of obesity and chronic diseases are to be achieved.

## Conflict of interest

The authors declare they have not any conflict of interest.

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