

When immigrating makes you sick

Richard Béliveau

Translated from Le Journal de Montréal, February 25th, 2019

A number of studies have found a significant increase in the risk for several chronic diseases among people who have immigrated to North America. According to a recent report, one of the factors involved in this phenomenon is an important change in the intestinal microbiome of these immigrants, which leads to obesity and to metabolic disorders that result from it.

The incidence of several chronic diseases (cardiovascular diseases, type 2 diabetes, several types of cancers) is much higher in North America than in other regions of the world. This suggests that the North American lifestyle (processed foods, sedentary nature) promotes the development of these diseases.

This is particularly well shown by the study of immigrant populations. For example, while Asian women exhibit one of the lowest incidences of breast cancer in the world, this cancer can become up to 4 times more frequent following their immigration to North America where it becomes similar to that of third generation Americans.

One of the important factors contributing to this phenomenon is excess weight. In fact, a study has shown that the proportion of obese immigrants had increased by a factor of nearly three at 15 years after their arrival, reaching 19%¹.

Amongst these immigrants, refugees seem to be particularly vulnerable to becoming obese, exhibiting weight gain, which is notably very rapid in those who are originally from South-East Asia². Given the well documented role for excess weight in progression of the ensemble of chronic diseases, it is probable that this major transformation in body weight plays a role in the increased incidence of these diseases following immigration.

REFUGEES AT RISK

To better understand the mechanisms behind this, a team of American scientists studied the Hmong and Karen ethnic communities who immigrated to the United States in recent years, particularly within the region of Minnesota³. The Hmong left Laos during the civil war which ravaged that country in the 1970s, whereas the Karen were for many years victims of repression by the military junta in Myanmar. These communities show levels of excess weight and obesity that are higher than in other Asian immigrants within Minnesota and are thus an interesting model for studying the factors involved in the relationship between immigration and obesity.

The researchers were particularly interested in the intestinal microbiome, the bacterial community present within the colon which plays a central role in the control of metabolism. To examine the effects of immigration, they compared the bacterial composition of the microbiomes within Hmong and Karen living in Asia with those of three groups: the Hmong and Karen living in



America, the children of these immigrants who were born in the United States and Caucasian Americans. In parallel, they also followed a group of 19 Karen refugees during their immigration to the United States by analyzing the variations in their microbiome during their first year on American soil.

THE ASSIMILATION OF MICROBES

The results obtained illustrate the extent to which immigration causes major changes in the composition of the microbiome. After only six to nine months in America, the Karen refugees already showed a major reduction in the diversity of the bacteria composing their microbiome, a phenomenon which is often a precursor sign for bad health and which has been associated with an increased risk for obesity. The microbiome of the immigrants also showed a diminution in the bacteria involved in the digestion of fibre (e.g. *Prevotella*) and an increase in *Bacteroides*, a species associated with a number of diseases, particularly autoimmune disorders. With time, these changes become even more important, particularly among people who are obese, and lead to a situation where the microbiome of the immigrants becomes very similar to that of native-born Americans, a similarity which is particularly striking in the children of immigrants born in the United States. In other words, the intestinal microbiome becomes rapidly similar to that of the natives of the receiving country and this "assimilation" can contribute to the strong increase in obesity observed in these immigrant populations (in one generation, the level of obesity rose from 5 to over 30% among the Hmong).

Immigration to America is generally associated with a spectacular improvement in living conditions, particularly for persecuted communities who have lived under very difficult conditions in their country of origin. Unfortunately, this better life can be counterbalanced by a deterioration in metabolic health when the immigrants adopt the North American lifestyle, particularly the eating habits.

- (1) Goel MS et al. Obesity among US immigrant subgroups by duration of residence. *JAMA* 2004; 292: 2860-7.
- (2) Careyva B et al. The effect of living in the United States on body mass index in refugee patients. *J. Health Care Poor Underserved* 2015; 26: 421-30.
- (3) Vangay P et al. US Immigration westernizes the human gut microbiome. *Cell* 2018; 175: 962-972.