

Feasibility of establishing relationships between cardiovascular disease mortality rates and iodine deficiency indicators in Latin American countries

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SUMMARY

Context: Iodine deficiency disorders (IDD) and cardiovascular diseases (CVD) have been recognized strongly in the 20th century as global problems with large populations at risk. Current evidence suggests that the two existing global health policies for tackling IDD using salt as a vehicle of fortification and reducing average population salt intake in order to prevent CDV may create a potential conflict between them.

In the Latin American Region, it has been demonstrated that the prevention of IDD through Universal Salt Iodization (USI) is possible by increasing dietary iodine intake, based on the assumption of an average salt intake of 10g per day at the population level to reach the personal daily iodine recommendation. Considering that evidence has demonstrated that high Blood Pressure (BP) is one of the main risk factors for CVD and that high BP could be influenced by lowering salt consumption (< 5g/day) , it could be assumed that iodized salt intake may be related to CVD morbidity and CVD death rates in this context. Despite the abundant scientific evidence on CVD and IDD, information that proves associations between IDD indicators and CVD morbidity and mortality does not yet exist. Therefore, in order to advocate for new adjustments in the

health policies aimed to eliminate IDD and to prevent CVD, scientific evidence is needed. Starting with ecological studies is the usual approach.

Objectives: to investigate the feasibility to establish a relationship between CVD mortality rates and IDD indicators in Latin American countries (LAC) for the period 1960 - 2006. Mortality data and data on IDD indicators in LAC were reviewed and trends in age-standardized mortality and IDD indicators described. Where possible, associations between IDD indicators and CVD mortality levels were investigated.

Methods: WHO data for cardiovascular registered deaths and IDD indicators were used. Only LAC that had data coverage over 75% for cause-specific mortality, CVD age stratified mortality rate and population figures with one cut-off point for at least two IDD indicators (Total Goiter Prevalence, Urinary Iodine Median and proportion (%) of households consuming iodized salt) given before and after USI introduction, were included. Age standardized CVD mortality rates were calculated through direct method using the world standard population. In order to investigate the relationship between CVD mortality rates and IDD indicators, simple linear regression and correlation analyses were performed at country level.

Results: Among the 23 Latin American countries, only 9 (Argentina, Chile, Costa Rica, Cuba, Guatemala, Mexico Panama, Uruguay, Venezuela, Brazil, Colombia, Ecuador and El Salvador) report mortality data in sufficient quality. Around 50% of the countries have at least two sets of time period data for total Goiter prevalence (%) and percentage of households consuming iodized salt before 2000. Sufficient data for the content of iodine in salt at the national level was not available. Data on UI from surveys conducted between 1993 and 2005 was available for 14 countries (60%). 12 out of those 14 countries had national UI data at one point of time. Nine countries (Argentina, Belize, Chile, Ecuador, Guyana, Honduras, Suriname, Uruguay and Venezuela) lacked national urinary surveys. Six countries (Brazil, Colombia, Costa Rica, Guatemala, Mexico and Panama) were selected according to criteria in order to illustrate CVD mortality rates and Iodine nutrition trends.

Overall CVD mortality rates rose before the 1970s in Colombia, Costa Rica, Mexico and Panama. Among the selected countries, Colombia (279,9/100 000

in 1968) and Brazil (259,7/100 000 in 1980) had the highest CVD mortality rates over the study period. A similar pattern of falls after the 1980s was observed in those both countries. Selected countries characterized by the lowest CVD mortality rates were Costa Rica and Guatemala, with an increasing CVD mortality trend during the 1990s for this second. Some differences in the trend coronary heart disease and stroke were seen among selected countries.

Steady decreases of Goiter were observed in 4 countries (Brazil, Colombia, Costa Rica and Mexico) in the same time period that the coverage of household iodized salt increased. The national UI medians from national surveys carried out in selected countries between 1994 and 1999 were above the normal level (100-200 µg/L) in five countries and in the normal range for Brazil.

The feasibility to investigate relationships was highly limited due to a lack of appropriate data and that no statistical associations were observed.

Conclusions: The lack of CVD mortality and IDD data, and the shift in IDD indicators from TGP to UI over the last decades in LAC resulted in substantial limitations for this study. In general, epidemiological health data is still scarce and has been collected in some LAC without standardized methodologies. Thus, the feasibility of establishing associations between those variables was very limited for the study period (1960-2006). The correlation findings remained insignificant. More precise estimates of associations between CVD mortality rates and IDD progress may be obtained in future studies as additional years of IDD data become available.