An Ethnographic Approach to the Nutrition Transition in Ecuador

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***Objective*: To offer an in-depth case study of how diabetes is affecting one urban family and one rural family in Ecuador.**

***Methods*: In-depth interviews, observations and participation in food preparation were realized in one rural family and one urban family living in Ecuador who have at least one member suffering from diabetes; this is a disease understood as a consequence of the nutrition transition. Emphasis was placed on the socio-economic factors that shaped the two families' experiences with diabetes.**

***Results*: The nutrition transition can be defined as a global trend towards diets based on highly processed foods and the appearance of diseases related to such diet modifications, such as diabetes and heart disease. Nutrition transition theory links urban areas with higher incidences of nutrition transitions than rural areas. However, it appears that the rural family studied for this paper is shifting towards a diet high in processed foods that is suggestive of a nutrition transition. This is a situation that requires further research. While urban and rural dynamics were considered throughout this investigation, socioeconomic status was another major variable when analyzing how both families dealt with diet and diabetes. The socioeconomic status of members in each family also influenced their medical trajectory: the rural family, which maintains a lower socioeconomic status than the urban family, was less likely to follow a medical treatment plan for diabetes. In both the urban and rural families, the eldest generation has lived through many of the changes in food preparation and consumption associated with the nutrition transition, such as switching from manual to mechanical cooking techniques and from consuming naturally sweetened to sugar-sweetened beverages. Most members of the urban family benefited from the help of a domestic employee in food-related activities. On the other hand, many members of the rural family were for some period of time working as domestic employees; this allowed them to learn how to cook at an early age and was also a source of financial and medical insecurity in at least one case.**

***Conclusions*: This case study describes one rural and one urban family's diets and reported changes in diets; it was found that even the rural family was experiencing changes in dietary habits that suggest the presence of a nutrition transition. This singular case study could serve as a springboard for future rural nutrition transition research using more statistically significant samples. Further research could determine if this is a confined case or a widespread issue, and could explain how different rural locations in Latin America, and the world, may be experiencing the nutrition transition.**

INTRODUCTION

The worldwide leading cause of death in 2011 was ischemic heart disease, a chronic condition also known as coronary heart disease. Cancer and diabetes—other chronic diseases—were also found within the top ten causes of death.[1] One interpretation of this unprecedented rise in chronic diseases is known as the nutrition transition, defined as an overall global trend towards diets based on processed foods containing more fat, sugar and salt, and fewer fresh, fiber-rich foods. These changes in food consumption promote a host of diet-related diseases, including diabetes and obesity.

The nutrition transition theory was developed by Barry Popkin, a professor of nutrition at the University of North Carolina at Chapel Hill, who has conducted population-level studies on the subject in Brazil, China, Japan, Mexico, Russia and the United States since the 1970s.[2] Popkin explains the nutrition transition according to three continuing historic shifts in dietary and lifestyle habits that took place in the last two decades of the twentieth century; they occur as countries become more urbanized and industrialized. First, a demographic shift from high rates of fertility and mortality, associated with intermittent famine, to low rates, associated with greater consumption of foods high in added fat and sugar; second, an epidemiological shift from high incidences of communicable diseases, such as tuberculosis and hepatitis, to high incidences of non-communicable diseases, such as diabetes and heart disease; third, a shift in the consciousness and behavior of individuals marked by healthier diet-related habits and efforts to prevent non-communicable diseases.[3]

Both epidemiological and demographic evidence suggest that Ecuador is undergoing a nutrition transition. Epidemiologically, Ecuador is experiencing high increases in non-communicable diseases, as indicated in Table 1; over the past ten years, non-communicable diseases have comprised the country's top killers. As stated above, one of the historic shifts that serve as evidence of a nutrition transition is a decrease in fertility. Ecuador is experiencing this shift: in 1960, the average number of children born per woman was 6.7 compared to 2.5 in 2010 (Table 1).[4]

The National Institute for Statistics and Census (INEC) reported that two of the principal causes of death in Ecuador were diseases related to hypertension and diabetes mellitus (which includes type 1 and type 2 diabetes).[5] For every 100,000 inhabitants in Ecuador, the incidence of diabetes rose from 80 in 1994 to 488 in 2010, and that of hypertension rose from 63 in 1994 to 652 in 2010. The coastal region records the highest rates for both diseases, women being more affected than men.[5] The fact that women living on the coast in Ecuador are experiencing higher incidences of hypertension and diabetes is a subject

that merits further research.

Nutrition transitions are overwhelmingly linked to urbanizing areas. Those residing in urban sectors, Popkin argues, more easily acquire modern diets and sedentary lifestyles that make them more vulnerable in comparison to those residing in rural sectors, who often maintain traditional eating behaviors and higher physical activity levels.[6] However, this case study shows that family members residing in rural Ecuador are also experiencing a nutrition transition. Detailed interviews conducted with family members living in rural Ecuador indicate the presence of dietary habits consistent with the nutrition transition, namely the consumption of high fat and sugar foods and the presence of diabetes.

Table 1. The Ten Principal Causes of Death in Ecuador (2000-2010)

	2000	2005	2010
1	Non-classified	Non-classified	Non-classified
2	Heart disease	Heart disease	Hypertensive heart disease
3	Cerebrovascular disease	Cerebrovascular disease	Diabetes mellitus
4	Diabetes mellitus	Hypertensive heart disease	Influenza and pneumonia
5	Hypertensive heart disease	Diabetes mellitus	Heart disease
6	External Causes	Pneumonia	Traffic accidents
7	Pneumonia	Ischemic heart disease	Cerebrovascular disease
8	Ischemic heart disease	Homicide	Homicide
9	Perinatal conditions	Traffic accidents	External Causes
10	Homicide	Perinatal conditions	Ischemic heart disease

Source: Data from the *Instituto Nacional de Estadística y Censos* (INEC) (4).

Nutrition transition research has generally applied predominately-quantitative, population-level studies that analyze demographic and epidemiological statistics. The latest attempt to address the nutrition transition in Ecuador was a two-part article detailing population and diseases trends.[7,8] Yet, only a few first-hand accounts contextualize how individuals and families experience these transitions in circumstances that are unique to Ecuador. This paper provides a deeper look into the little-documented effects of the Ecuadorean nutrition transition.

Several factors contribute to this rise in non-communicable diseases. One such factor is the prevalence of improperly balanced diets. In Ecuador, balancing food groups is a challenge for the general population. This mainly occurs due to an over-emphasis on starches, such as rice, potatoes and plantains, and fats, such as margarines and butter, as well as an under-emphasis on proteins and vitamins from meat, dairy, legumes and vegetables.[9]

Government and industry-controlled food systems exert a large influence in shaping dietary habits. Global marketing strategies that push novel, hyper-processed foods generally lead to a rejection of more traditional, less industrialized fare.[10] Foreign food policy in Ecuador has historically favored imported cash crops, like wheat, that hurt the domestic production of similar crops; this puts food production in foreign hands.[11]

Evidence of a nutrition transition in Ecuador underscores the need for more investigation into the dietary changes associated with the rise of non-communicable diseases. Becoming more informed about the implications of nutrition transitions may help encourage public policies that promote robust prevention plans and response strategies in Ecuador. As evidence in this paper suggests, rural family members in Ecuador are experiencing diet and disease-related changes associated with the nutrition transition. This paper aims to determine how socioeconomic status affects the diet and disease state of the family members interviewed in Ecuador, detail how their eating habits have changed over time from information provided by interviews with older and younger family members and, finally, review new policies aimed at managing the rise in non-communicable diseases.

METHODS

This case study took an ethnographic approach to the nutrition transition using careful observations, one-on-one interviews and time spent cooking and/or eating with each member of the two families interviewed. The criteria for choosing the two families stipulated that at least one member from each family have diabetes, that the families originate from different geographic locations and that they have differentiated socioeconomic statuses. All members of the urban family reported that their total monthly household earnings ranged from more than $1,001 to more than $3,000, while all members of the rural family stated that their total monthly household earnings ranged from less than $500 to no more than $1000. The rubric was taken from the five income categories designed by FLACSO-Ecuador.[12]

Ecuador's National Census and Statistics Center (INEC) determined these socioeconomic categories using the following dimensions: housing, education, economics, consumer goods, technology and consumption habits. Each dimension was given a set of points; according to the average points earned for each dimension, five socioeconomic groups were formed. From highest to lowest, the five socioeconomic groups were given the following classification: A, B, C+, C- and D.[13] According to the latest 2011 socioeconomic stratification survey performed by INEC, all members of the urban family would be placed in categories A and B, which are effectively the two highest socioeconomic classes; all members of the rural family, excluding one, were classified in categories C- and D, which are the two lowest socioeconomic classes.[13]

In order to locate families to be interviewed, diabetic associations were first contacted. Because this initial strategy did not produce results, friends, family members and colleagues were asked if they knew someone with diabetes. This second strategy successfully located two families. One family was from the capital city of Quito, located in the Sierra, and the other was from a small, rural town called Flavio Alfaro, located on the Coast. The family from Quito will be referred to as the urban family and the one from Flavio Alfaro is the rural family, though one member from the rural family now resides in Quito. The origins of the rural family can be traced to the northeast of the province of Manabí, in the town of Flavio Alfario. As of 2010, close to 40,000 people were residing in the biodiverse town of Flavio Alfario, where agronomy comprises the main economic activity.[14] Quito, the capital of Ecuador, is a bustling city with a little over two million habitants. Public and private administration and commerce, along with health, education and social service industry activities, compose the largest economic sectors.[15]

Five members from each of the two families, spanning three different generations, were interviewed for a total of ten interviews. In the rural family, the eldest interviewee was an 85-year-old grandmother, who had a 58-year-old daughter and three granddaughters, ages 42, 39 and 36. It should be noted that these granddaughters share different fathers. Because the 91-year-old grandmother in the urban family could not be reached, an interview with her daughter was conducted that followed the same questionnaire used in all other interviews. The other members of the urban family included the grandmother's 58-year-old son and his wife, as well as their two daughters, ages 31 and 27.

The urban family had one member, a 61-year-old from the second generation, who suffered from diabetes. The rural family had two members, a 58-year-old female from the second generation and a 36-year-old female from the youngest generation, who suffered from diabetes. It should be noted that the 36-year-old female moved to Quito at the age of 17, though she affirmed that she largely maintains a traditional diet which reflects the kinds of food eaten in her rural hometown, Flavio Alfaro.

The field research began in March 2012 and was concluded in September 2012. Each interview lasted an average of two to three hours, and extra time was spent observing living conditions and participating in cooking-related activities. The main categories included in the interview questionnaire were: organization of food shopping and cooking; food and shopping before and after onset of diabetes; changes/difficulties/novelties related to diabetes; consumption habits on weekdays, weekends, at work, outside the home, during holidays and during special events; learning how to cook; healthcare services; exercise/physical activity; and opinions about nutrition in general (Table 2).

All of the interviews were conducted in Spanish with the exception of the eldest daughter from the urban family, as she preferred to speak in English. After being recorded, each interview was transcribed. The research was conducted under the norms for ethical social research established by FLACSO Ecuador.[16]

RESULTS

The nutrition transition noticeably impacted both the families. Over the three generations interviewed in both families, a change in consumption from less processed foods to more processed foods was reported. Notably, results from the interviews conducted showed that socioeconomic status and access to quality medical care were influential variables in determining how family members responded to diabetes. Members suffering from diabetes with higher socioeconomic status had more success in managing their diabetes than those with lower socioeconomic status.

One intriguing result was related to the role of domestic employees. In Ecuador, domestic employee services are commonplace in a large number of middle and upper class families. Approximately 300,000 individuals participate in this profession, and women comprise 95% of this workforce.[7] Interestingly, while most members of the urban family who were interviewed for this case study have at one time employed or currently employ such services, all members of the rural family who were interviewed for this case study at one time worked or are currently working as a domestic employee. Consequently, the urban family reported greater ease in preparing and eating meals at home. Members of the rural family reported learning how to cook traditional Ecuadorian recipes at an early age. The connection between domestic employees and the nutrition transition and/or disease is one that could be further explored in Ecuador, as very little research has been conducted on the subject.

Socioeconomic status was found to be a major contributor to the way that both families live, eat and manage their diabetes. The rural family had a history of socioeconomic insecurity, evidenced by very low levels of education, unstable employment and income and little access to quality medical care. Ecuador maintains a social security system that champions free healthcare for all, yet offers reportedly unreliable services in rural parts of Ecuador. Poor quality healthcare complicates the status of patients suffering from non-communicable diseases. For example, the quality of healthcare coverage in Flavio Alfario was reported sub par. As the 58-year old female suffering from diabetes pointed out, "The town hospital is free because of the State, but it takes one to two months to give back the results."[17] Because of this delay, she feels forced to visit clinics – but at $40 to $60 per exam and often an over one-hour long bus ride, it is a significantly burdensome and time-consuming expenditure. Consequently, she does not regularly visit the doctor. Her daughter, the 36-year-old who has lived in Quito since she was 17 and also suffers from diabetes, reported similar behaviors as a consequence of the lack of economic resources available to manage her diabetes.

Both members of the rural family, including the 36-year-old who suffers from diabetes, reported that their doctors provided no comprehensive information regarding dietary modifications for disease management; they were simply told to avoid sugar and fried foods. As a result of insufficient dietary interventions, both maintained a diet that over-emphasized refined carbohydrates, fried meats and fish, and minimal consumption of high-fiber fresh vegetables. This has also resulted in the continuance of symptoms related to diabetes for both members.

On the other hand, most members of the urban family received a college education and all reported stable employment and income. Almost all reported having access to both private and public healthcare services, implying extensive health security. As a result, the 58-year-old father with diabetes visits his doctor and follows a strict diet regimen.

In response to the father's diabetes diagnosis, the urban family dealt with the disease by decreasing the amount of refined carbohydrates and increasing the amount of legumes, fresh vegetables and salads in their diet, and also restricting the consumption of soda and fried foods. As a result, the father reported that his hemoglobin A1c percentage, a three-month average of his blood glucose levels, has been under control since he started making appropriate dietary modifications. This change was facilitated by the guidance of their daughter, who was studying as an undergraduate for a career in nutrition at the time of her father's diagnosis, though his regular doctor visits and access to quality medical care were other factors contributing to his diabetes management.

After analyzing the interviews from three distinct generations in both families, the older generations reported consuming fewer processed, industrial foods than did the younger generations. As the grandmother from rural Ecuador recalls, "We used to pick, toast and grind coffee beans by hand. Now, everyone I know drinks instant coffee."[18] It was reported that the eldest member of the urban family, at age 91, transitioned from eating mostly baked goods and drinking mostly fresh fruit juice in her youth to consuming a large amount of soda and packaged sweets today; she also used fresh butter before and now relies more heavily on oil and processed margarine. Similarly, she rarely ate out growing up and now eats out at least once a week, frequenting fast food restaurants more often. The eldest member of the rural family, at age 84, reported similar dietary transitions. She cited changes from manually grinding coffee and peanuts to mechanically grinding them to discontinuing the process altogether and buying them prepackaged; she also mentioned reluctantly switching from butter to margarine and oils.

The youngest generation of the urban family, two women ages 27 and 31, reported a high consumption of processed foods in their diets due to time constraints. One reports eating breakfast on the go while driving. They admitted to preparing sauces from packets instead of from scratch and freezing whole meals, practices that both women's mothers would never have condoned for fear of compromising quality. The youngest generation of the rural family, ages 36, 39 and 42, also mentioned dietary changes evidencing the nutrition transition: higher meat consumption, the use of oils, a greater presence of refined carbohydrates and the use of more kitchen appliances than their mother and grandmother. Testimonies of shifting food habits over three different generations provide insights into the various diet-related changes associated with nutrition transitions.

These ten food histories comprise a microcosm of how dietary changes, and ultimately disease, have evolved over time.

DISCUSSION AND CONCLUSION

Limitations of the present ethnographic investigation include the fact that the sample size was small by design, the urban family had a member who was a nutritionist and the rural family had one member with diabetes who grew up in a rural area, but now resides in an urban area. However, the ethnographic methodology used in this investigation has been particularly useful in portraying a richer account of the nutrition transition at the family level by entering the homes and observing the eating habits of each family member interviewed. Recording and reporting personal stories is a qualitative method that provides highly valuable testimony and insight into eating habits over time. The interviews performed with family members over three generations culminated in interesting food histories of both the urban family and rural family. These ten food histories comprise a microcosm of how dietary changes, and ultimately disease, have evolved over time in two families in Ecuador.

After conducting interviews with both urban and rural family members, it is apparent that any setting, urban and rural alike, can experience the changes in diet and lifestyle attributable to nutrition transitions. Fieldwork should be continued in rural areas, presenting an interesting opportunity for future research.

One major observation noted by this case study was the difficulty that the rural family members had in accessing quality healthcare and managing their diabetes. The set of socioeconomic circumstances that guide the rural family's diet and health-related behavior can be interpreted through the phenomenon that Brazilian nutrition expert and professor Dixis Pedraza deems "obesity in poverty"—except that here "diabetes

in poverty" is observed.[19] This theory explains that those populations in Latin America with the lowest levels of education and lowest socioeconomic status have a greater risk of becoming obese. A "diabetes in poverty" approach could help explain how the economic instability of the members of the rural family may be a hindrance to proper disease management.

As previously mentioned, all Ecuadorians are eligible to receive the state-sponsored social security healthcare program, yet inadequate medical attention in Flavio Alfaro has been reported. The insufficient attention paid to the rise in non-communicable diseases may also be compounded by the fact that Ecuadorian public health policy has only recently responded to this rise. The Public Health Minister (Ministerio de Salud Pública) has enacted two national strategies that are still in the beginning stages. The first is a strategic plan for the prevention and control of chronic, non-communicable diseases), whose elements and objectives are comprehensive and achievable.[5] They include capacity-building, education, research, communication and community participation. The second outlines a specific set of protocols that doctors are expected to follow when treating chronic, non-communicable diseases; it provides a step-by-step guide that doctors can use for a more attuned and thorough treatment process.[20] While both strategies are promising steps forward, their principles and protocols must be adopted in everyday practice, especially in places like Flavio Alfaro.

RECOMMENDATIONS

Future prevention and response plans to the nutrition transition must include a broad analysis of information in order to address the root causes of and manage the rise in non-communicable diseases. Several projects and theories are already approaching nutrition from a variety of disciplines in an effort to more effectively solve the issues associated with non-communicable diseases.

Food sovereignty, a growing new alternative in agriculture, is a movement dedicated to constructing a more just and equitable food system by empowering producers and consumers to take greater ownership of their food culture. Food sovereignty approaches the problems related to food production and consumption from a number of perspectives that include policymaking, farming, public health, the environment and gender.[21] Facing complex nutritional dilemmas such as diabetes and obesity will require responses that include community action and encourage consumers to understand how, where and by whom their food is produced. This is especially important in Ecuador, where twenty-seven percent of its population is employed in the agricultural sector.[22] Farming communities in the northern region have recorded some of the highest rates of acute pesticide poisonings in the world. This situation is largely due to a market dominated by pesticide industries and a government that offers farmers little education about proper pesticide use.[23] New research has linked pesticide use to insulin resistance and type 2 diabetes.[24] Policies that encourage food sovereignty could include diversifying crops and rewarding farmers who produce organic and native fruits and vegetables. Local authorities and health experts could assist in encouraging consumption of Ecuadorian-grown produce. This would not only deliver health benefits for consumers, but also create economic and social benefits for producers.

One way to create more connected communities is to develop more individual- and family-level responses to the nutrition transition, responses that Suárez-Herrera et al, specialists in social participation, detail and defend.[25] The authors argue that traditional population perspective approaches taken in response to the nutrition transition have undermined individual and family perspective responses to the nutrition transition. They propose greater social participation as a more inclusive means to responding to the nutrition transition. This can be feasibly achieved through community nutrition assessments and programs.

The integration of social participation campaigns could take on many forms. For example, Ecuador would benefit from public nutrition education in order to correct what has been described as a pervasive overemphasis of refined carbohydrates.[15] Campaigns and events that involve and invite community participation could take the form of healthy cooking demonstrations, food label education, grocery store tours that educate individuals about healthy and affordable options, healthy food tastings, Community Supported Agriculture (CSA) programs and free community nutrition classes at public libraries or in public parks. With donations and funding from the private sectors and grants from the public sector, these interactive education programs can become sustainable solutions. Moreover, student volunteers, university professors, public health professionals, nutritionists and members of the community could be recruited to jumpstart and manage such programs.

All of the solutions mentioned above can take place both in urban and rural settings. Extra emphasis must be placed on implementing these solutions in rural areas of Ecuador, that have already been impacted heavily by the nutrition transition, and which could suffer even more without sufficient measures in place to manage nutritional challenges. Such solutions are important not only in Ecuador, but also at a global scale, as the nutrition transition is a worldwide phenomenon. More generally, countries must prioritize public health nutrition education and intervention strategies that empower individuals and communities to make dietary and lifestyle choices that prevent non-communicable diseases.

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