

Understanding the social determinants of health/disease: intestinal parasites and malnutrition in the families of Urabá, Colombia

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Introduction

The triple burden of endemic pathogenic intestinal parasites (PIP), malaria, and hunger-malnutrition remains quite common in many countries of the Americas, Africa, and Asia.

PIPs “affect more than 800 million children worldwide, most of whom live in impoverished settings.”¹ 20–30% of Latin Americans are infected.² PIP infections can last for years and, while everyone is at risk for parasitic infection, the burden of diseases falls primarily on children under 15 years of age.

In 2010-2011, 104 countries reported data on endemic malaria; 99 had active transmission, with 219 million cases and 660,000 deaths. In the Americas, cases have fallen 60% since 2000.³ Malaria is particularly dangerous for children and pregnant women. In these vulnerable groups there can be four, six, or even more recurrences of malaria each year. The resultant hemolytic anemia further worsens their pre-existing nutritional anemia

In 2011, an estimated 165 million (26%) of the world’s children under the age of 5 were chronically malnourished.⁴ The most common forms of malnutrition are chronic protein-calorie malnutrition (years of insufficient caloric and protein intake), anemia (primarily iron and protein deficiency), and specific vitamin and mineral deficiencies syndromes.

Infections (PIP, malaria, others) often co-exist with malnutrition and the two problems are mutually reinforcing. Each increases the seriousness and mortality of the other. The recurrent and chronic nature of these conditions provokes inflammatory and immunological abnormalities.^{5,6} The triad of “malnutrition-infection-immunological compromise” harms millions of people,^{6,7} particularly those in countries economically and politically dependent on the so-called “world powers.”⁸⁻¹⁰

In Colombia, this triad is commonplace in areas such as Urabá, Alto Sinú, Alto San Jorge, and Bajo Cauca.¹¹⁻¹⁵ Over 60% of Colombia’s malaria cases occur in these regions,^{11,12,16} where 60% or more of children aged <10 years are chronically malnourished,¹¹⁻¹⁵ and living conditions are extremely poor for the families of these children as well as for pregnant mothers.¹⁵ In these regions, social inequity and inequality have run rampant since time immemorial and show no indication of diminishing.¹⁷

Why do PIPs and malnutrition continue to be endemic throughout the world? For decades now we have had a solid scientific understanding of these diseases. We have developed proven methods to eliminate them as public health problems. Their persistence indicates that their structural origin or determinants are social in nature; historical social pro-

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Submitted: December 12, 2012

Accepted: January 13, 2013

Conflict of interest: None

Peer-reviewed: Yes

cesses (economic, social, ideological, political, cultural) are at the root of the health-disease process. This process is not fundamentally determined by genetic and biological, or natural environmental factors; rather it is primarily the social causes that encompass and reinforce the biological causes. Social factors here mean something more than the typical epidemiological search for statistically significant associations between various “epidemiological variables” and particular diseases.

The objective of this paper is to use the tools of critical epidemiology to examine the prevalence of PIPs and malnutrition and to describe the living conditions of children aged <15 years and their families in the Urabá region within the Department of Antioquia in northwest Colombia.

Materials and methods

Study site

The Urabá region is relatively flat; it is home to banana, plantain, and oil palm plantations as well as cattle ranches. Turbo, a seaport, is one of Antioquia’s municipalities and contains the *corregimiento* (township) of El Tres, a primarily rural town.

Study design

We implemented a cross-sectional survey.

Inclusion and exclusion criteria

Inclusion criteria were a) families with a child aged <15 years; b) residence in El Tres; c) voluntary agreement to participate in the study and informed consent. Exclusion criteria were a) plans to leave El Tres; b) requests for compensation of any kind to continue in the study; and c) withdrawal of informed consent.

Recruitment

Apparently healthy children were recruited at home or at school. Researchers visited families in their neighborhoods and villages, explaining the project and inviting them to participate. All children entered the study at a single point in time. Only 11 families, all from rural areas, refused to participate because they were planning to leave the area.

Sample size calculation

Sample size was calculated using the following statistical and epidemiological criteria: a) the population of children under the age of 15 was estimated at 3000; b) the proportion of children with any disease was estimated at 50% (available data suggested that 80% would have intestinal parasites and 65% would be chronically malnourished but we chose 50% to increase our sample size); c) a precision of 0.02 and d) a confidence interval of 95%. This resulted in a sample size of 1334,¹⁸ which was increased to 1600.

Laboratory tests

Stool was examined to determine the presence of helminths and protozoa using a single sample (approximately 3g of fecal matter) preserved in 10% formalin for 4-7 days. A direct visual exam was done and if no parasites were detected, a concentrated specimen was tested. Both tests were conducted using standard procedures.¹⁹

A complete blood count (type IV)²⁰ was performed using an automated analyzer, the Celltac Auto Nihon Khodan® MEK 8118 (Nihon Khodan Co., Tokyo, Japan). Laboratory reference values for the diagnosis of anemia were hemoglobin ≤11 g/dL for ages 0.5-6 years and ≤12 g/dL for 7-14 years. Retinol was evaluated in the Nutrition Laboratory of the National Institute of Health (Bogotá) using high performance liquid chromatography with a Waters 600E liquid chromatograph and UV detector. Values <20 µg/dL (0.698 µmol/L)²¹ were considered deficient. Serum ferritin was measured by microparticle enzyme immunoassay in the clinical laboratory of the IPS Universidad de Antioquia (Medellín). The Abbott AxSYM® System kit was used (reference 7th 58-20 B7A583 56- 4324/R12, Abbott Laboratories, USA). The cutoff point to define low iron stores was <12.0 µg/L in the absence of infection and <30 µg/dL in the presence of infection. Serum C-reactive protein (CRP) was measured by turbidimetry using BioSystems (CRP) Latex in the IPS laboratory. A CRP value over 8 mg/L indicated inflammation.

Social surveys

Seven questionnaires were administered to each family in the study. They examined:

1. Paid employment
2. Unpaid labor
3. Social conditions and lifestyle
4. Workplace and exposure to intestinal parasites
5. Socioeconomic, environmental health, and housing conditions
6. Diet
7. Economic Activity of Adults

Questionnaires contained both open and closed-ended questions and were drawn from standard instruments, mostly pre-coded and pre-tested in similar research settings.^{14,15,22-24}

Data analysis

The principal statistical analysis consisted of summary measures of central tendency and dispersion of the variables. All decisions on statistical significance used a probability (p) value of <5%. Data analysis was done with SPSS 10 and EpiInfo 6.0 software.

In general, the analysis was guided by the tenets of Latin American critical epidemiology, which considers the health-disease process through the lens of social determination of health.²⁵⁻²⁹

Ethical aspects

The project was approved by the ethics committee of the Institute for Medical Research, School of Medicine, University of Antioquia. Each patient's guardian gave informed consent before they were enrolled.

Results

A total of 1600 children were recruited and studied: 19% were urban (n=304) and 81% rural (n=1296); 49% were male (n=785). Mean age was 6.68 years; mean weight was 20.88 kg; mean height was 110.4 cm. Among children aged 4-6 years, 30% attended school; aged 7-10 years, 80%; and aged 11-14, 70%.

Chronic malnutrition was defined as a height for age less than 2 standard deviations from the median,

based on the reference standards of the National Center for Health Statistics, USA. Chronic malnutrition affected 55% of male children and 45% of female children; this difference was statistically significant. (p < 0.003)

Depending upon the age, 49% to 79% of children had anemia. Mean values for ferritin were 27.0±22.0 µg/L; for retinol 26.0±9.0 µg/dL and for CRP 3.0±10.0 mg/L. When the population was divided into four groups (male/malnourished, male/not malnourished; female/malnourished, female/not malnourished), values for hemoglobin, ferritin, and retinol in children aged <7 years did not show significant intergroup variation using Kruskal-Wallis ANOVA (hemoglobin p=0.325; ferritin p=0.337; and retinol p=0.507). However significant differences were found in children 7 years of age or older when the population was divided into the same four groups (hemoglobin p=0.013; ferritin p=0.010; retinol p=0.040). Hemoglobin and ferritin were lowest in malnourished boys. Retinol levels were lowest in malnourished girls.

Pathogenic parasites were found in 87% of children; 63% had protozoa and 69% had helminth infections (Table 1).

The most common ethnic group (65%) was Chilapo (the ethnic name of immigrant farmers from the Sinú and San Jorge river valleys in the department of Córdoba). Family characteristics are summarized in Table 2. These are generally nuclear families, typically 2 parents and 3-4 children. The

Table 1. Prevalence of pathogenic intestinal parasites

Parasite	n (total = 1545)	%
<i>E. histolytica</i>	346	22.0
<i>G. lamblia</i>	523	34.0
Ascaris	688	44.5
Whipworms	700	45.3
Hookworms	436	28.2
Strongyloides	107	6.9
<i>H. diminuta</i>	3	0.02
<i>H. nana</i>	8	0.5
Pinworms	6	0.4
Tapeworms	0	0

Table 2: Family characteristics in El Tres (Turbo, Urabá, Antioquia)

Characteristic	Summary
Ethnic group	65% of respondents were of Chilapo ethnicity
Family type	Most respondents lived in nuclear families
Average number of family members	5.4
Average maternal age	22.5±4 years
Average maternal parity	2.0
Mothers	
Formal education	60% had some primary schooling (grades 1-5)
Knows a specific trade	14% of women knew a specific trade
Gainfully employment	20% of women were gainfully employed.
Type of work	Usually involving low academic-technical skills
Fathers	
Literacy	82% were literate
Formal education	66% had some primary school education 32% had finished primary school; 36% at least one grade of secondary school 9% had graduated secondary school
Trade	50% were unskilled or worked in very low skilled trades 15% worked in agriculture 16% were day laborers
Job stability	66% were stably employed
Control over means of production	These men were always dependent upon an employer and were never owners of the means of production (land, machinery, equipment, tools, raw materials, etc.)

parents have little formal education and very limited training in specific trades. Their jobs pay very little and many are not stable. Gainfully employed mothers (20% of total) always held jobs involving low-skill activities.

Housing (Table 3) is of poor quality; more than half of homes have dirt or sand floors and metal roofs (in a region with high annual temperatures). Regarding basic residential services (Table 4), three quarters of the families use rainwater (alone or with another source) for drinking and cooking.

Eighty percent of families rely solely on income from a working husband or common-law partner; average monthly income is US\$160. Seventy-five percent of families regularly obtain food from raising small animals and/or from kitchen gardens; 15% regularly receive gifts (such as food or money) from relatives and friends. Consumption of animal protein is deficient; only eggs are eaten daily. Household

consumption of foods providing vitamin A is as follows: organ meats once a week; milk 2-3 times a week; fruits with provitamin A once a week. Fifty-five percent of families are considered to have low or average amounts of vitamin A in their diet.

Individual processes (bio-psycho-social processes at the individual and family level) refer to the most immediate level of determination or causation at which health and disease problems are found. This is the level at which diseases are identified, their frequency and distribution mapped out, and a detailed description of the full disease course (from diagnosis to resolution) can be worked out. As demonstrated in Tables 1-4, individual consumption patterns in children and their families with regard to basic goods and services showed severe insufficiency in quantity and quality of food, housing, and basic services (water, sewage, garbage, and waste disposal, energy sources for cooking, lighting, and

Table 3. Living conditions in El Tres (Turbo, Urabá, Antioquia)

Dwelling	Result
Hut or shack	30%
Families per dwelling	One 70%; Two 20%
Ownership of dwelling	Own home: 63%
Roofing material on dwelling	Zinc/tin sheets: 75%
Exterior walls	Present 89%; wood 65%
Floor of dwelling	Dirt or sand 54%; cement or tile 43%
Vegetation in area around house	69%
Stagnant or running water in area around house	66%
Ownership of mosquito nets	95%
Sleepers per mosquito net	2-3
Regular family anti-mosquito activity	Only 38% do this

operating appliances, etc.). In addition, 62% of families do not engage in regular activities to protect their home against mosquitoes despite living in areas with malaria, dengue fever, and other diseases transmitted by biological vectors. Sixty-nine percent of homes have surrounding vegetation, and 66% have stagnant or running water near the house. Likewise, almost one in three families toss their garbage or waste out in the open or in the water in the area around the home. All this suggests a lack of health education and/or very limited capacity to create healthy living environments.

According to our data, mothers lack even mid-level technical job training. Only a few (20%) have paid work and all spend a lot of their time on housework. Fathers also lack formal education, work at jobs that require little training, and have unstable jobs that are paid poorly with respect to

their individual and family needs. Paid and unpaid work is demanding with regard to time spent, physical effort (from which they cannot adequately recover due to low income and other living conditions), and harsh occupational/environmental conditions. Farm work is usually done in open fields, in intense heat under the hot sun, and with constant exposure to insect bites.

Consumption of goods and services by the Chilapo ethnic group is clearly deficient in quantity and quality. This results from lack of ownership, possession, or control over the means of production (land, raw materials, tools, machinery). The people of El Tres lack land and livestock and thus work as operators or day laborers at the service of those who own both. Those who work in non-agricultural jobs also do not own the means of production.

Table 4. Essential residential services in El Tres (Turbo, Urabá, Antioquia)

Essential residential services	Percentage
Water for drinking and cooking comes primarily from the rain	75%
Indoor toilet	66%
Type of toilet	Running water or flush: 35% Latrine or hole in floor: 11%
Connected to municipal sewer system	41%
Cooking fuel	Chopped wood: 60% Gas: 32% Other: 8%
Garbage collection: Urban families (irrespective of final destination of the garbage)	57% of urban households had their garbage collected by the municipality or a private company
Garbage collection: Rural families	30% of rural families disposed of trash on land around the house

Discussion

Critical epidemiology seeks to understand how social, cultural, political, and economic processes determine the distribution of health and disease in populations. The first premise of critical epidemiology is that reality is organized hierarchically and that levels of higher complexity determine, in general, what happens at levels of lower complexity; critical epidemiology also recognizes that dynamic, two-way relationships exist. Social organization influences other factors, such as locality and family characteristics (mid-level or group level). These first two levels influence conduct, biology, and the subjective understanding of individuals (micro or individual level). This leads to the second premise: that biological and psychological processes are subordinate to social processes. A further premise of critical epidemiology is that to understand collective health problems, we must understand how social groups are integrated into the society.^{26,30} This integration defines a configuration of risks and opportunities that either constrain or foster the development of inherent human potential. Social structures can pose harmful risks (destructive processes) or opportunities (protective processes). These processes are expressed in epidemiological profiles or patterns of morbidity and mortality specific to a particular group or social class. These patterns reflect relative similarities within groups and relative differences between groups.²⁶ If we start with the study of social groups to explain collective health problems, then we must analyze not only average health indicators, but also their distribution: how health indicators differ between groups and individuals within the population.³¹

Individual and family processes

Our data demonstrate that the health and social status of Urabá children and families is worse than that of Antioquia as a whole; this finding is consistent with other studies done in Urabá and Bajo Cauca, Antioquia.^{13-15,23,24,32} The harshness of living conditions in Urabá is corroborated by government data on unmet basic needs,³³ illiteracy,³⁴ dwellings without safe water,³⁵ insufficient dietary energy in-

take,³⁶ and extreme inequality (the concentrated distribution of and access to land).³⁷

Our findings involve diseases such as intestinal parasitosis that are associated with fecal contamination of the environment. They not only document the terrible social and health situation of the inhabitants of El Tres, they also speak to decades of neglect and indifference. In 1977, 35 years ago, Urabá was the region of Antioquia with the lowest number of dwellings obtaining household water from urban (25%) or rural (10%) systems and with sewer connections to urban (25%) or rural (4%) sewage systems.³⁸ In 2000, Turbo was described as:

“... generally lacking in physical infrastructure and in sewage and water systems for both urban and rural areas. In the municipal seat, the situation is aggravated by the constant influx of people from the countryside. ... After Chigorodó, Turbo has the lowest coverage for piped water (53.4%). In the urban area, coverage is 79.4% but the water is not potable, water pressure is poor, and the water supply is subject to frequent service cuts. 37.9% of rural household have access to poor quality, untreated water. Sewerage coverage (in 2000) was 20.6%; in the municipal seat it was 45%, while in the rest of the municipality it was only 5.9%. Electrification reached 70.8% of dwellings in the municipality; 88% in the urban area and 59% in the rural area.”³⁹

Our findings of chronic malnutrition, possible iron deficiency anemia, and retinol deficiency in children are consistent with prior work done in Urabá and Bajo Cauca, Antioquia.^{13,14,22,23,40} These problems also affect pregnant women.⁴¹

Malnutrition and its manifestations are evidence of hunger, “... the most basic human drive. ... The most primitive instinct of man is to eat. ... Never does man lose his rationality and his senses more than when he is hungry,” as per Omar Cabezas in “A Love Song for Men” (as cited by Morales).⁸

“The current extent of hunger (which stands in stark contrast to the existing scientific and technical opportunities to eradicate it) reveals not only that we live in a world with considerable imbalance, injustice, and irrationality, but that,

in addition, we are witnessing a dangerous time for humanity.”⁸

As noted by the editors of *Salud Ambiental*:

“Among the things that should bring our attention to these neglected diseases is the availability of effective strategies and tools that could permit us, with a small investment of resources, to decrease the number of cases, through either prevention or treatment programs. In addition there exist global and/or regional agreements to reduce the burden of these diseases and even eliminate them.”⁴²

Morales says that:

“[T]he most recent analyses of the persistence of hunger and its consequences in the world may not only demonstrate the increasing seriousness of this problem in recent times, but also the incredible lack of political will to address hunger by those who hold the strings in the major world powers and international agencies.”⁸

Thus, more than any other “neglected disease,” (using a trendy euphemism) hunger and malnutrition are the most forgotten and ignored.

Hunger and malnutrition have always been the consequence, essentially, of social processes, not biological ones. They are determined in part by how society is structured and operates, and only by changing these will it be possible to eliminate hunger. The “lack of political will” that Morales mentions is a matter of twisted economic systems, such as the savage or neoliberal capitalism plaguing the world.

It is inexcusably naive (by its complicity with the outrageous current situation) to examine and explain hunger and malnutrition primarily as a function of genes, of biological markers, of such and such processes, or of the “social variables” that “may or may not be associated.” Aside from individual exceptions, hunger and malnutrition have always been determined, and increasingly more so, by inequitable social processes that produce enormous inequalities.¹⁷

PIPs in 87% of children is much too high. Even worse is that fact that the situation in El Tres and other communities has not changed in the past four decades. In 1965, 48 years ago, 80% of Colombia’s population was infected with PIPs; the prevalence in children aged 1-4 years was 83%, in those aged 5-14 years it was 90%,⁴³ and in the population as a whole was 86.5%. What Morales has to say about governments and agencies regarding hunger and malnutrition must also be said about intestinal parasites: there is no interest in eliminating them because the current economic and political system does not permit it. How can we explain and understand that decades have gone by – decades which have brought enormous scientific and technical capacity to act and to prevent these problems – yet hunger, malnutrition, and parasites still run rampant?

We continue to write papers such as this one, yet afterwards governments and agencies remain unmoved. It is unacceptable that governmental authorities remain inactive when faced by the well-documented benefits that the availability and use of appropriate waste disposal offers in terms of reducing the acquisition of soil-borne helminths.⁴⁴

Particular or group processes

As noted by Carlos Miguel Ortiz Sarmiento:

“An agrarian peasant economy, which barely provides a livelihood for the subsistence farmer’s family and never any surplus for accumulation, still characterizes many sectors of Urabá. This is what one sees travelling in the plantain plantations along the road from Turbo to Necoclí, to the plots of plantains, rice, and corn on lands cleared only 40 years ago in western Mututá and Belén de Bajirá, passing through the plantain-shaded cacao groves of San José de Apartadó, in the Abibe foothills.”⁴⁵

The dominant feature of land ownership in Urabá has been an accelerated concentration of vast amounts of land in the hands of a few individuals.⁴⁵ As recently as 2007, this concentration continued in the cattle ranching regions; cattle production has been a notable beneficiary of capital derived from the drug trade. In contrast, investment by traffickers

in banana plantations has been less marked.⁴⁵ In Urabá, in 2005, the Gini coefficient was 0.720 to 0.742. In Turbo, the 2002 Gini coefficient was 0.83,⁴⁶ indicating that most of the land is held in a few hands.

The Chilapo are peasants from the department of Córdoba who moved to Urabá. This has implications for their cultural values and identity as a social group. They feel that the name Chilapo only applies to those who are descended from the Zenú Amerindian group, ancient residents of the Sinú River valleys. Even when they have mixed with other ethnic groups they remain Chilapo. From their indigenous ancestors, they retain their attachment to the land; their greatest desire is to buy a piece of land to farm and to die there. They hope to leave the land to their children; it is considered the most precious gift. They are not businesspeople and their only interest in money is to meet their basic needs. They are hard workers and skilled at clearing vegetation for pasture land or crops.⁴⁷

The overarching context

The *social dimension* in Critical Epidemiology explores the key social organizations in the community under study and how research subjects participate in these organizations, be they unions, artisan guilds, employers' associations, non-governmental organizations, women's and youth associations, or sports and recreation groups. Similarly, the activity of these organizations should be studied, as well as how and to what extent they are involved in the social life of the community, its struggles, achievements, and setbacks.

The *political dimension* involves an examination of the political organization in the study community: the government: its type, structure, and mode of operation; the relationship between individuals and social groups and the government; the operation and structure of political parties and groups; the constitution and the framework for social security in general and health in particular; and the structure and operation of the social security and health systems, among others.

The *cultural and ideological dimension* refers to the study of the culture and ideas in the community and the social classes/groups involved in the study.

“Culture is the assemblage of all forms, models, or patterns, explicit or implicit, through which a society regulates the behavior of the individuals belonging to it. As such, it includes customs, practices, codes, standards, and rules on ways of being, dress, religion, rituals, behavioral norms, and belief systems. From another point of view, culture can be seen as all the information and skills that humans possess. The concept of culture is fundamental to the disciplines that are responsible for the study of society, especially to anthropology and sociology.”⁴⁸

The *environmental dimension* refers to both the natural and the social environment. These are inseparable in the dialectical concept of critical epidemiology; i.e., they are one. The natural environment refers to the surroundings that affect living organisms and, in particular, how that natural environment affects peoples' lives and the societies in which they live. It comprises the totality of those natural assets that – in a given place and time – influence the lives of human beings now and in the future.

A few short examples will paint a picture about what is occurring in Urabá, where Turbo and its *corregimiento* El Tres are located. The reigning capitalist system in Colombia, increasingly widespread and entrenched,^{9,10,49} is evident in Urabá both through industry and trade and in banana agribusiness, one of Colombia's leading exports (together with coffee and flowers). Urabá has the largest banana plantations in the country. The concentration of the land into a few – far too few – hands is breathtaking. Urabá is primarily rural and both pre-capitalist and capitalist forms of economic production coexist there.

Northern Urabá, where Turbo, Necoclí, and other municipalities are, covers 2,786 km² (24% of Urabá, Antioquia), and is major cattle ranching area. Cattle raising is the primary economic activity and the ranches sit next to an agricultural zone of smallholdings where farmers grow plantain and cacao, among

other crops. Central Urabá covers 4,643 km² (40% of the region) and is home to the main agricultural and livestock activity, focused on growing bananas and plantains for export and on ranching. There remain a few small, forested areas. The south, covering 4,235 km² (36% of the region), has a great diversity of ecosystems, with a high percentage of undisturbed forests; its primary economic activities revolve around small-scale farming, logging, and some livestock ranching.⁵⁰

Alongside the agrarian capitalists are the agrarian workers: the agrarian proletariat. Colombia's numerous banana workers have left their mark on the country's history with their protests and political struggles in Urabá and in other places in Colombia (especially in the department of Magdalena). Madariaga, speaking of Urabá's banana workers noted: "Given the denial of their most basic human rights and an absentee government, the workers were basically forced to organize themselves and engage in armed struggle."⁵¹ The peasants of El Tres do not have an economic relationship with bananas, but they do have a relationship with plantains and with ranching which are central to their economy; this is also true of Urabá's other municipalities. The plantain plantations, and even more so, the cattle ranches, give work to some people, typically for a few days a week.⁵⁰

In Turbo, a peasant economy is found primarily in two areas: the flood plains and the foothills of the Abibe Mountains. It is worth noting that this subsistence economy is threatened by the expansion of cattle ranching lands; in 1999, Turbo had 741 cattle farms. Their average size is unknown. 256 hectares is considered the "family agricultural unit" for beef cattle, suggesting that 189,000 hectares are dedicated to ranching. In 1990, these farms were distributed as follows: 219 near the border with the municipality of San Pedro, Urabá, in the mountain valleys where the Mulatos River runs; 374 farms between the foothills and the municipal seat; and 198 farms in the vicinity of the Pan American Highway, which links Medellín and Urabá.⁵²

Violence, war, and the systematic violation of human rights have always been present in Urabá,

but since 1980, they have grown to unimaginable dimensions.^{51,53,54}

*"The [forced] displacement [of the population] originated primarily in those rural areas where armed groups have a major presence and the government is either absent or poorly represented. ... Forced displacement is not solely due to the actions of armed groups outside the law, but is also linked to processes of nation building. It is the basis of the current social, demographic, and economic configuration of Colombian society. It is related to the implementation of an economic model that favors industry, trade, and capital accumulation at the expense of the rural economy."*⁵⁵

Conclusions

- For many children in Turbo malnutrition, anemia, and iron and vitamin A deficiencies are present in high levels and interact in causing poor health.
- From 1965 to 2013, Urabá's living conditions have improved little, judging from what we have learned about the prevalence of PIPs, hunger and malnutrition, and living conditions.
- The current living conditions and the economic and political model in Urabá produces and maintains these conditions and prevents any improvement or solution to these problems.

Funding

Universidad de Antioquia (UdeA); UdeA Sustainability Strategy 2013-2014; "Codi-Regionlización" project (UdeA) 8764-2530; "Colciencias" project: Gestational and placental malaria: epidemiology and consequences of sub-microscopic plasmodium infection.

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