

Chapter 8

People Live Here: Maternal and Child Health on Isla Isabela, Galapagos

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People Live Here!

Although famed for the riches of the flora and fauna on the islands, the Galapagos Islands have a long history of human presence. Dating back as far as the Incans, there is evidence of successful trips between the islands and the mainland around the late 1400s. The first documented case of an individual living on the archipelago is credited to Patrick Watkins in 1807. The islands were a popular location for sea-faring voyagers to restock food (giant tortoises and sea lions), as did Darwin's boat, *HMS Beagle*, in 1835 (Stewart 2006). Over the decades, there were several attempted settlements, and in 1893, a colony was founded on present-day Isabela Island (Constant 2006). The islands have also served as refuge for pirates, sailors crossing the Pacific, and wanderers for hundreds of years, with the culmination of the present-day inhabitants and the creation of a recognized Ecuadorian province, with a provincial government located on San Cristobal Island (Bassett 2009).

The archipelago consists of 14 volcanic islands, four of which are currently populated: Santa Cruz, San Cristobal, Isabela, and Floreana. The capital is Puerto Baquerizo Moreno on San Cristobal. Ninety-seven percent of the geographic area of the Galapagos is a designated national park, with only a small and increasingly populated area available for human habitation (Parque Galapagos 2011). Each year the number of tourists visiting the Galapagos Islands increases,

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with approximately 173,287 in 2010 arriving primarily by plane and then touring in a variety of sizes of boats, ferries, ships, and yachts. Staying in hotels on the islands is increasingly popular among tourists, providing opportunities for employment for the local population while at the same time creating environmental pressures on a fragile ecosystem.

The Galapagos Islands have experienced significant population growth, increasing more than 300% in the past few decades. The 1990 census marked the population at 9,735, whereas the 2010 census listed the official total population at 25,124 residents. Santa Cruz has the largest population at 15,393, with 2,256 on Isabela Island (Instituto Nacional de Estadística y Censos 2011). Floreana has only 120 residents (last counted in 2006). The population is doubling every 11 years, and it is estimated that there will be 40,000 people on the islands by 2014 (Bureau of Statistics of Ecuador 2006). Because of this rapid growth, the Special Law of the Galapagos was passed in 1998. This law placed restrictions on migration to the islands by limiting residency to only those living on the islands in 1998. It is estimated that 20% of the residents in the Galapagos do not have government permission to live there (Patel 2009).

Higher wages (up to 70%) and better living conditions on the islands, compared to on the mainland, continue to fuel this recent wave of immigration. In Ecuador, 46% of the population falls below the poverty line (United Nations Development Program 2009). Although specific figures for residents of the Galapagos are not available, it is likely that poverty levels are much lower. However, despite the economic lure, migration can disrupt family relationships, social networks, and access to resources in the new location for migrants and locals alike (Acosta et al. 2006).

According to the Charles Darwin Foundation (CDF), a local nongovernmental organization active in the development and conservation of the Galapagos, the “economic growth has resulted in unsustainable population growth, socioeconomic stratification, civil unrest, strained public services and infrastructure, an increase in the number of invasive species, and a number of conflicts with conservation goals and authorities” (Epler 2007). Surprising to many is the fact that there is a scarcity of fresh water in the Galapagos. This, in addition to a lack of wastewater treatment and sanitation facilities, greatly impacts health conditions (Walsh et al. 2010). Due to increasing economic and population growth, the geographic isolation of the islands, and agricultural planting restrictions for the preservation of indigenous flora, both food security and food quality have direct health impacts upon the residents of the islands. In addition, the strain placed upon utility infrastructure results in water contamination, affecting the human residents as well as sea life in the surrounding waters.

Although little has been published about the health situation on the islands, Galapagos residents face several challenges to protecting their nutrition and health status. There is no mention of the health in the comprehensive report by the Charles Darwin Foundation (Epler 2007) and a search on PubMed from 1995 to April 13, 2012 revealed only one research study (Walsh et al. 2010) published in English with references to human health in Galapagos.

The goal of this study was to better understand the participants’ personal health concerns and their perceptions of the health of their young children. Interviews

focused on: diet, food preparation, shopping patterns, knowledge of appropriate feeding and dietary needs, lifestyle and physical activity patterns, health seeking behavior, and reasons for migrating to the islands.

Data Collection Methods

We have collected multiple sources of data for this paper, including observations, informal interviews, a short survey, and in-depth home interviews with mothers of children under 2 years of age. In 2009, one of the authors (Waldrop) visited Isabela, interviewed key informants and observed facilities related to the availability of health services. Early in 2010, a pen and paper survey was distributed to a convenience sample of adult students taking English classes and living on Isabela. To participate in the survey, the student had to be the parent of at least one child under 5. The survey contained 32 questions, and 18 respondents answered most of the questions. Table 8.1 describes the characteristics of this sample. The results of this survey were used to inform the development of questions for in-depth, semi-structured interviews conducted in summer 2010 by the other two authors (Page and Bentley). The interview data are primarily qualitative but include the collection of some quantitative questions and measures, such as anthropometry of the mother and child, a depressive symptoms instrument, and body size preference data. The interview guide consisted of primarily open-ended questions; however, some sections utilized short previously validated tools for specific topics that were scored independently (The Center for Epidemiologic Studies Depression Scale CES-D) (Radloff 1977). Potential participants were identified through referrals from the nurse in the government clinic (*subcentro*). Twenty interviews were conducted in Spanish with mothers of children of less than 5 years of age in their homes (18) or in the workplace (2).

Table 8.1 Participant characteristics (surveys)^a

Characteristics	Mean (range)	N (%)
Sex (female)		15 (83)
Age (years)	28.8 (21–38)	
Time on island (years)	13.8 (1–34) ^b	
Education: high school or more		18 (100)
Employed full time		6 (33)
Employed part time		6 (33)
Unemployed		6 (33)
Married or union libre ^c		15 (83)

^aN=18

^bN=13, excludes five who have lived on the island their whole lives

^cCivil union

Table 8.2 Maternal characteristics (interviews)^a

Characteristics	Mean (range)	<i>N</i> (%)
Age (years)	28.5 (19–37)	
Time on island (years)	7.75 (1–17) ^b	
Education: high school or more		13 (65)
Religion: Catholic		14 (70)
Employed full time		8 (40)
Employed part time		3 (15)
Unemployed		9 (45)
Married or union libre ^c		18 (90)

^a*N* = 20^b*N* = 16 (excludes four who were born on island)^cCivil union

The index child was designated as the youngest child under 5 and over 6 months of age in each household. Each interview lasted approximately 1 h and was audio recorded. All participants provided informed consent in Spanish, in writing and orally. Table 8.2 describes the characteristics of this sample.

In addition to the interviews with mothers, contact was made with local medical professionals (including all active doctors, the director of the health center, and the lead nurse). Informal interviews were conducted with local government officials, such as the mayor, local pharmacists, directors of local nongovernmental organizations and local school officials.

Data Analysis

The qualitative data from the in-depth and key informant interviews were coded and analyzed using a software program, ATLAS.ti. Codes were generated from the interview guide and additional codes were added based upon reading the transcripts. Display matrices (Miles and Huberman 1994) were generated that summarized specific categories of data, such as “perceived health problems” or “water quality.” Survey data were quantified into response percentages for each question.

Life on the Island

Isabela Island is a quiet corner of the world. There are two ways on and off the island—ferry boat or a 9-seater plane—though most residents travel by boat when they leave or return to the island. The boat ride to Isabela from Santa Cruz is approximately 2 h across the high sea. Upon arrival, one can hire one of a handful of “white trucks” (a dollar for a ride anywhere in the main part of the city), or one can

walk the mile into town. Most of the roads consist of sand and volcanic pebbles and, in certain areas, are shaded by local vegetation, non-indigenous palm trees, and scattered volunteer houseplants.

The principal city on Isabela, Puerto Villamil, has a central plaza, surrounded by local government offices, a variety of stores, restaurants, and the local Catholic church. The island has an open and friendly atmosphere, with locals passing by with salutations and ease.

When asked, “what is it like to live on the island?” the majority of women interviewed (13 or 65%) used the Spanish phrase “tranquilo,” or “calm, peaceful, relaxing, and tranquil.” This response was typically followed with statements about personal security on the island, such as:

La tranquilidad. (it’s peaceful, calm)... it’s not dangerous, it’s not too expensive... the natural environment... No one lives a hectic or busy city life. Where you are always running somewhere then running somewhere else. No, here, it’s more peaceful, calm (tranquilo). (married woman, 36)

Another interview question asked women, “why do you live on the island?” The most frequent responses made reference to a spouse’s need to secure work (4) and because, in contrast to the mainland, the island provided a safe environment for their children to play outdoors (4). One mother expressed concern for her child when she visits the mainland:

When we are there (Guyaquil), she gains a lot of weight, and I think it’s because there isn’t anything to do, you can’t do anything, because there aren’t any parks, and it’s always dangerous... Here we have the freedom to run, to go out, to play, go to the beach, even though things can be dangerous, its way less dangerous than it is in Guyaquil. (married woman, 28)

Economic opportunities provided an incentive to move to the Galapagos, and relatively safe communities encouraged migrants to stay. However, despite these benefits, the rapid increase in population has not been matched by supporting infrastructure, and the participants have some serious concerns about problems that impact their health and well-being.

Common Problems on the Island

When survey respondents were asked to list the top three health problems, they noted the following: lack of a hospital or emergency services, inexperienced health personnel, and a shortage of specialists and medications (13/18). One woman stated:

I believe that knowledgeable doctors are instrumental. There is a lack of all the necessary tools to medical care, medicines, most of all. So that, for example, you go to the doctor and (he) says buy yourself this medicine, but one goes to look to pharmacies and it is not there. One must often send to Santa Cruz or elsewhere. Imagine an emergency, what happens? The patient dies because there is no way. So I think that’s quite necessary here. (married woman, 37)

A few women surveyed noted problems associated with poor diet, such as cardiovascular disease and cholesterol (3/18). Another woman interviewed reported:

I understand that the majority of the people here suffer much from cholesterol... , triglycerides, hypertension, diabetes, for the food here, people eat meat and pork and fries, things like that with a lot of fat in the food. For me, I do not like and I have to take care of my daughter because I see that she is chubby. (married woman, 31)

The three most serious problems survey respondents listed were lack of emergency care (12/18), diarrheal illness (12/18), and lack of potable water and sewage contamination (6/18). One woman said:

My daughter suffers from asthma and needs a spray (ventolin) and it is not always available here. This aspect we can control but in an emergency... There are many who have died on the dock from medical inattention or lack of transportation. (married woman, 28)

Access to Healthcare

Medical Infrastructure on Isabela Island

As in most of rural Ecuador (Lopez-Cevallos and Chi 2009) on Isabela, the Ministry of Health provides services via a recent graduate from an Ecuadorean medical school assigned through the 1-year obligatory rural medical services program in the *subcentro* (health center). The *subcentro* has 8–10 rooms used for patient care, a lab, two storage areas for medications and vaccinations, and a reception area. There are two rooms that could be used to provide hospital-like care, but there are not enough nurses on the island to provide this service. There is also a room that could be used for surgery which is equipped with oxygen, suction, and rudimentary anesthesia equipment; however, without an anesthesiology provider, this is also not utilized. One room is used to deliver babies, but there are no fetal monitoring capabilities, except for a handheld Doppler (ultrasound) that allows only auditory assessment of the fetal heart rate. A 15-year-old ultrasound machine can also be used for in utero evaluations. This clinic performs 1–2 deliveries a month, but if a women can afford it, she will typically travel to Guayaquil before her due date to deliver her baby at a hospital that can provide emergency intervention if necessary. This clinic has a radiograph machine, but no one trained to take the X-rays. The lab can perform blood counts, chemistries, and microscopic analysis on blood samples. There are also a centrifuge and a microscope for evaluation of urine. The clinic has the ability to test for and treat sexually transmitted diseases. Prenatal care and immunization clinics are also provided.

The primary physician interviewed at the clinic believes there has been an increase in adults with diabetes and hypertension on the island. She also reported that there are seven brothels on the island and many other sex workers who are waitresses in the bars. Chlamydia and gonorrhea are a problem, and it is possible there are HIV cases because there are some on Santa Cruz Island (personal communication from

hospital doctor on Santa Cruz to Bentley 2010). The clinic provides IUDs (Copper T) and oral contraceptive pills, as well as condoms when available.

A private municipal clinic, the *policlinico*, also provides sporadic physician services for a fee or in a health maintenance organization style with monthly \$10 payments. This is a smaller but newer facility with only one patient exam room. There are rooms for lab equipment, childbirth, and surgery. The lab has newer equipment than the *subcentro* and can perform similar tests. The labor room is equipped with a fetal monitoring system, but no ultrasound is available. The room for surgery lacks any equipment. There is no potential for X-rays here. Approximately once a month, this facility hosts “campaigns” where physicians come over from the mainland with all the equipment needed to provide a week’s worth of care for patients. There is also one active privately practicing physician who also provides health services.

Since there is no ability to perform surgical procedures under general anesthesia, all residents and tourists within the archipelago in need of these services must travel to Santa Cruz (for minor procedures) or the mainland over 600 miles away for major procedures, such as cesarean births. However, a large, modern, and better-equipped hospital on San Cristobal Island is currently under construction with the expectation of providing surgical, obstetrical, gynecological, dental, and preventive health services to all residents and visitors within the archipelago (Basantes, 2011, personal communication).

Childbirth on Isabela Island

Of the mothers interviewed, only two chose to have their children on Isabela. The survey participants were not asked about the birthplace of their children, but of the five participants who reported living their whole lives on Isabela, three reported being born on the mainland. The survey and interviews did not specifically address the mother’s decision of *where* to birth her children; however, it should be noted that minimal health services pose an increased risk for women who wish to have their children on Isabela, as well as an increased financial burden for women who must travel to the mainland to seek neonatal healthcare facilities. Although there are no official statistics on infant deaths during delivery on the island, the day before one of the authors arrived on Isabela in 2009, an infant had just died during delivery (Sanchez, 2009, personal communication).

Perceptions of Child Health and Medical Care

Several of the mothers interviewed (17/20) stated that they believed that their child’s health was “good”; when asked to elaborate, a common explanation involved the local doctors stating that their child was “good” or “healthy.” While the opinions of medical professionals were considered, many expressed concerns over the lack

of well-trained medical professionals. One woman responded to the question, “how do you see the overall health of your child?” by explaining her doubts about the local medical providers:

Yea... I can't tell you 'good,' 'good,' because I don't know what illnesses can do, I don't know... I have my doubts... you know, that baby has a little growth, and here, the doctors say that it is a node, but that little ball, every once in a while it grows a little more, and they didn't tell me anything...., I would like to take him outside (mainland) so that I can get an ultrasound, I think that's what it's called, to see if it is what the doctors here say it is...., or to see if it is something else, sometimes, you know, they can be tumors... (co-habiting woman, civil union, 29)

Even though the women did not completely trust their local doctors or have confidence in their medical training, most felt they had no other options for obtaining medical advice or care.

Limited medical services and constant staff changes within these services affected the decision making of mothers concerning where to receive medical attention. Half of those interviewed identified the *subcentro* as their primary medical location. However, obtaining local free services, long waits, changing staff, and inaccurate diagnoses were among several deterrents. Medical attention provided at the *subcentro* is commonly performed by a physician who has just completed medical school (as described above) with little to no oversight. One woman stated, “I go there because it is the only choice I have.” All other medical services on the island are private and therefore have associated costs. Some of the women mentioned that if the *subcentro* was closed (weekends or nights), then they would have to take their child to get private medical attention.

One quarter of the women interviewed preferred to receive medical attention (annual checkup, etc.) for their children from pediatricians on the mainland, whenever their finances allowed them to make this journey. One woman explained that she prefers to call her pediatrician on the mainland and correspond via email in order to receive basic medical advice for her child. Families with limited disposable income are at a significant disadvantage for medical treatment on Isabela; their only option is to receive services at the *subcentro*. Five women clearly stated that financial reasons were why they did not seek medical attention at the private *policlinico* (a charge of \$2 USD is the average cost for a child consultation at a private clinic on Isabela). “Here, at 4 p.m., they close the hospital (subcentro). If there is an accident, you have to go find a doctor and you'll die before you find one” (married woman, 24).

Survey respondents (16/18) echoed these sentiments, reporting that they did use the local healthcare providers for medical attention and advice, with only two mothers reporting that they would call or travel to the mainland to see a pediatrician when their children were ill. However, parents also reported using a variety of remedies for common illnesses, such as a cough or cold, ranging from vitamin C to probiotics and other over-the-counter products. Most felt that there were adequate over-the-counter medicines available but prescription drugs were often in short supply or unavailable.

Eighty-three percent of those surveyed reported that they left the island for medical care at some point. The primary reason was for childbirth. Other reasons why

care was sought on the mainland included no emergency care or X-rays, lack of specialists or experts, and a lack of confidence in the providers and services available. When asked what services they would like to see available on the island, pediatric care, obstetrics, and gynecology were at the top of the list. A variety of other specialists were also listed.

Food and Nutrition

Food arrives on Isabela by boat or airplane, or is grown in the highlands. Produce and some animal source foods grown in the highlands are brought to town twice a week to sell in the local Saturday market during the dry season and, as weather and roads permit, in the rainy season. Almost all of the markets allow clientele to purchase products on a line of credit that the families pay back at a later date (on payday or in increments).

About half of the women interviewed reported that they were the primary food purchasers within their households, and 4/20 said that their husband was the primary shopper. For 4/20, husband and wife shared the food purchasing power/responsibility. A small number depended on a mother/mother-in-law to purchase food for the family. Residents were also asked where they usually shopped for food. Most listed the many commercial vendors in Puerto Villamil (16/18 surveyed) and about half of these also shopped at the local Saturday market.

The majority of respondents surveyed or interviewed reported that there were sometimes or always shortages or a scarcity of the foods they would like to purchase. Most listed vegetables as the food they would like to buy that was frequently not available. Other items not available were grains, varieties of cheeses, and meat products. The cost of food was sometimes a barrier (6/20 interviewed). One family reported importing foods with a long shelf life (rice, sugar, oil) from the mainland as a way to economize, but that this option was not available to those without partners on the mainland and/or the financial means to complete such transactions. Sometimes food arriving from the mainland was already spoiled (2/20). One islander said:

I'll tell you the truth... you can't provide 100% nutrition, because here, you can't have 100% nutrition, not for the children or for the adults, because the systems, it's really, really difficult to get food here. If I wanted to give an apple to my son, it (the apple) has to come 4, 5, sometimes 8 days in a boat, and the boat, if you could see one of these boats, where the products come from, it is in horrible conditions. The fruits are mishandled, sun burnt and exposed to heat, they arrive soaked... (Husband of a mother interviewed, 37)

Despite complaints of shortages, most felt that they could procure a "quality diet" although the variety of foods, especially vegetables, was limited. The same thoughts were echoed when asked about the quality of their children's diet. Most parents reported that they were able to give their children a balanced diet, although, at times the lack of availability, variety and/or high cost of vegetables was a barrier.

Water and Sanitation Issues

The municipality provides the principal water source for Puerto Villamil. The only treatment provided is filtration through a series of sieves in order to remove pebbles and rocks (Walsh et al. 2010). On Isabela, the primary water source is located near the northern part of town, and if one follows the same road out of town and up the mountain, the island's dump will be found. Several people expressed concerns about waste from the dump leaking out and entering the already vulnerable water source.

Several women interviewed (12/20) identified water as a primary area of concern and one of Isabela's greatest challenges. One quarter noted that the water was undrinkable and that payment was required for water access or treatment. Several noted that the contaminated water caused infections (8/20), especially vaginal infections among women and skin infections among children. These same concerns were also highlighted by the survey participants. They reported diarrheal illness (12/18) and the lack of potable water and sewage contamination (6/18) as two of the top three most serious problems on the island. In addition, there were several reports of children getting sick from accidentally swallowing untreated water.

I wish you could take a sample of the tap water to a lab. It isn't even acceptable, even to bathe with. And this water has to be used to prepare foods, and sometimes (wash) the children. So, look, that's what we are suffering from, and that is what we are hoping for, and wishing that they can treat it (the water). (married woman, 37)

When those surveyed were asked if they could change one thing about living on the island, the second most common response was "clean water." One stated "The water, to have potable water, it is the fundamental problem and it is very serious for health."

Additional Health Issues

The 20 women and children interviewed had their weights and heights measured in their homes. Overweight and obesity were common: nine women were overweight (BMI greater than 25) and five women were obese (BMI over 30) (Table 8.3). According to the World Health Organization (2008) *z*-score definitions, ten children had weight for length/height or BMIs in the normal range, six children were at risk for overweight (*z*-score above 1), one child was overweight (*z*-score above 2) and one was obese (*z*-score above 3). In this sample of children, there was also one child whose weight for age was wasted (*z*-score below -2) and one who was severely wasted (*z*-score below -3). The severely wasted child was also severely stunted (*z*-score below -2) according to length for age.

When queried about their perceptions and preferences for their own body size, the majority of mothers preferred a smaller body size than their perceived current body size, both for personal and for health reasons. However, their perceptions and preferences differed when reporting on their children. The mothers preferred their

Table 8.3 Women's anthropometry (interview)^a

	Mean (range)	N (%)
Height (cm)	154 (142–164.7)	
Weight (kg)	65.25 (47.3–89.1)	
BMI (mean)	27.3 (20.3–37.4)	
Normal		6 (35)
Overweight		9 (45)
Obese		5 (20)

^aN=20

children to be larger than they currently perceived them, either for personal reasons and/or because they felt that a larger child reflects a healthier child.

The women interviewed were also screened for symptoms of depression using the CES-D. This is a screening tool for the presence of symptoms associated with depression. Scores ranged from 3 to 30 (highest possible score=60); the higher the score, the higher the endorsement of depressive symptoms. Five women (25%) scored above 15, which is indicative of a significant level of psychological distress. In the normal population it is expected that approximately 20% will score above 15 (Radloff 1977).

When asked to describe one thing they would change about life on Isabela, the most frequent response was to increase available activities and educational venues. This was expressed as wishing for opportunities to finish or continue their studies. As one person said, “if I had not had to abandon my early studies I would be a professional today.” Another respondent could not choose just one thing and stated:

If I could change medical care, I mean so that you would not have to go to Guayaquil or Quito to solve something because if I could (have) done the same right here. Education would also be something important because this (here) does not meet the demands of the modern world.

Conclusion and Discussion

This exploratory study about women's experiences living on Isabela Island, and their concerns about the health and nutrition of their families, identifies several problems that could be addressed by the local and national governments. A major concern is the lack of consistent quality medical care. The lack of any specialists, such as pediatricians and gynecologists, is mentioned repeatedly. Another key problem for locals and tourists alike is the limited access to emergency services. Increases in population and in the number of tourists who visit the island make this a significant issue.

Worries about the lack of fresh drinking water and health problems associated with contaminated water, such as fungal skin infections, parasite-associated diarrhea, and vaginal and urinary tract infections support the findings of Walsh et al. (2010).

Lack of access to fresh water for drinking, cooking, or bathing compromises parents' ability to ensure healthy growth and development of their children, particularly for those younger than 5 years old that are the most vulnerable.

Many are also concerned about the limited access to locally produced fresh foods, especially vegetables. They dislike dependence on imported, expensive food and the irregular delivery of food and supplies via boats and ships. Many noted concerns about the high cost of healthy foods. The increased availability of highly processed foods that have a longer shelf life but are also less nutritious contributes to obesity here as elsewhere in the world.

We also found that classic characteristics of the nutrition transition currently exist on Isabela Island (Popkin 2006). We identified the presence of "dual burden households," defined as the coexistence of individuals who exhibit signs of both under- and overnutrition within the same households (Doak et al. 2002; Popkin 2006; Waters 2006). For example, in very young children (under 5 years of age), the lack of adequate nutrition and feeding, coupled with high rates of gastrointestinal infection, may result in stunting and poor development. Among adults, overweight and obesity are prevalent and similar to those in urban Ecuador Bernstein 2008). Obesity and overweight in Ecuador, as elsewhere, are associated with high prevalence of chronic diseases, such as diabetes, cardiovascular disease, and hypertension (Bernstein 2008).

However, despite the many reported problems, most women appreciate the positives of living on Isabela Island, such as the tranquility and the perceived safety for their children, and the opportunity for employment and higher income.

As we noted in the title of this chapter, people *do* live in the Galapagos and they will continue to provide the services and products that are in demand by increasing population growth and tourism. Access to adequate health services, food, and water are the basic requirements for human health and well-being. The residents of the Galapagos deserve no less.

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