
October 24, 2012

The Island Where People Forget to Die

By DAN BUETTNER

In 1943, a Greek war veteran named Stamatis Moraitis came to the United States for treatment of a combat-mangled arm. He'd survived a gunshot wound, escaped to Turkey and eventually talked his way onto the Queen Elizabeth, then serving as a troopship, to cross the Atlantic. Moraitis settled in Port Jefferson, N.Y., an enclave of countrymen from his native island, Ikaria. He quickly landed a job doing manual labor. Later, he moved to Boynton Beach, Fla. Along the way, Moraitis married a Greek-American woman, had three children and bought a three-bedroom house and a 1951 Chevrolet.

One day in 1976, Moraitis felt short of breath. Climbing stairs was a chore; he had to quit working midday. After X-rays, his doctor concluded that Moraitis had lung cancer. As he recalls, nine other doctors confirmed the diagnosis. They gave him nine months to live. He was in his mid-60s.

Moraitis considered staying in America and seeking aggressive cancer treatment at a local hospital. That way, he could also be close to his adult children. But he decided instead to return to Ikaria, where he could be buried with his ancestors in a cemetery shaded by oak trees that overlooked the Aegean Sea. He figured a funeral in the United States would cost thousands, a traditional Ikarian one only \$200, leaving more of his retirement savings for his wife, Elpiniki. Moraitis and Elpiniki moved in with his elderly parents, into a tiny, whitewashed house on two acres of stepped vineyards near Evidilos, on the north side of Ikaria. At first, he spent his days in bed, as his mother and wife tended to him. He reconnected with his faith. On Sunday mornings, he hobbled up the hill to a tiny Greek Orthodox chapel where his grandfather once served as a priest. When his childhood friends discovered that he had moved back, they started showing up every afternoon. They'd talk for hours, an activity that invariably involved a bottle or two of locally produced wine. I might as well die happy, he thought.

In the ensuing months, something strange happened. He says he started to feel stronger. One day, feeling ambitious, he planted some vegetables in the garden. He didn't expect to

live to harvest them, but he enjoyed being in the sunshine, breathing the ocean air. Elpiniki could enjoy the fresh vegetables after he was gone.

Six months came and went. Moraitis didn't die. Instead, he reaped his garden and, feeling emboldened, cleaned up the family vineyard as well. Easing himself into the island routine, he woke up when he felt like it, worked in the vineyards until midafternoon, made himself lunch and then took a long nap. In the evenings, he often walked to the local tavern, where he played dominoes past midnight. The years passed. His health continued to improve. He added a couple of rooms to his parents' home so his children could visit. He built up the vineyard until it produced 400 gallons of wine a year. Today, three and a half decades later, he's 97 years old — according to an official document he disputes; he says he's 102 — and cancer-free. He never went through chemotherapy, took drugs or sought therapy of any sort. All he did was move home to Ikaria.

I met Moraitis on Ikaria this past July during one of my visits to explore the extraordinary longevity of the island's residents. For a decade, with support from the National Geographic Society, I've been organizing a study of the places where people live longest. The project grew out of studies by my partners, Dr. Gianni Pes of the University of Sassari in Italy and Dr. Michel Poulain, a Belgian demographer. In 2000, they identified a region of Sardinia's Nuoro province as the place with the highest concentration of male centenarians in the world. As they zeroed in on a cluster of villages high in Nuoro's mountains, they drew a boundary in blue ink on a map and began referring to the area inside as the "blue zone." Starting in 2002, we identified three other populations around the world where people live measurably longer lives than everyone else. The world's longest-lived women are found on the island of Okinawa. On Costa Rica's Nicoya Peninsula, we discovered a population of 100,000 mestizos with a lower-than-normal rate of middle-age mortality. And in Loma Linda, Calif., we identified a population of Seventh-day Adventists in which most of the adherents' life expectancy exceeded the American average by about a decade.

In 2003, I started a consulting firm to see if it was possible to take what we were learning in the field and apply it to American communities. We also continued to do research and look for other pockets of longevity, and in 2008, following a lead from a Greek researcher, we began investigating Ikaria. Poulain's plan there was to track down survivors born between 1900 and 1920 and determine when and where individuals died. The approach was complicated by the fact that people often moved around. That meant

that not only were birth and death records required, but also information on immigration and emigration.

The data collection had to be rigorous. Earlier claims about long-lived people in places like Ecuador's Vilcabamba Valley, Pakistan's Hunza Valley or the Caucasus Mountains of Georgia had all been debunked after researchers discovered that many residents didn't actually know their ages. For villagers born without birth certificates, it was easy to lose track. One year they were 80; a few months later they were 82. Pretty soon they claimed to be 100. And when a town discovers that a reputation for centenarians draws tourists, who's going to question it? Even in Ikaria, the truth has been sometimes difficult to nail down. Stories like the one about Moraitis's miraculous recovery become instant folklore, told and retold and changed and misattributed. (Stories about Moraitis have appeared on Greek TV.) In fact, when I was doing research there in 2009, I met a different man who told me virtually the exact same story about himself.

The study would try to cut through the stories and establish the facts about Ikaria's longevity. Before including subjects, Poulain cross-referenced birth records against baptism or military documentation. After gathering all the data, he and his colleagues at the University of Athens concluded that people on Ikaria were, in fact, reaching the age of 90 at two and a half times the rate Americans do. (Ikarian men in particular are nearly four times as likely as their American counterparts to reach 90, often in better health.) But more than that, they were also living about 8 to 10 years longer before succumbing to cancers and cardiovascular disease, and they suffered less depression and about a quarter the rate of dementia. Almost half of Americans 85 and older show signs of Alzheimer's. (The Alzheimer's Association estimates that dementia cost Americans some \$200 billion in 2012.) On Ikaria, however, people have been managing to stay sharp to the end.

Ikaria, an island of 99 square miles and home to almost 10,000 Greek nationals, lies about 30 miles off the western coast of Turkey. Its jagged ridge of scrub-covered mountains rises steeply out of the Aegean Sea. Before the Christian era, the island was home to thick oak forests and productive vineyards. Its reputation as a health destination dates back 25 centuries, when Greeks traveled to the island to soak in the hot springs near Therma. In the 17th century, Joseph Georgirenes, the bishop of Ikaria, described its residents as proud people who slept on the ground. "The most commendable thing on this island," he wrote, "is their air and water, both so healthful that people are very long-lived, it being an ordinary thing to see persons in it of 100 years of age."

Seeking to learn more about the island's reputation for long-lived residents, I called on Dr. Ilias Leriadis, one of Ikaria's few physicians, in 2009. On an outdoor patio at his weekend house, he set a table with Kalamata olives, hummus, heavy Ikarian bread and wine. "People stay up late here," Leriadis said. "We wake up late and always take naps. I don't even open my office until 11 a.m. because no one comes before then." He took a sip of his wine. "Have you noticed that no one wears a watch here? No clock is working correctly. When you invite someone to lunch, they might come at 10 a.m. or 6 p.m. We simply don't care about the clock here."

Pointing across the Aegean toward the neighboring island of Samos, he said: "Just 15 kilometers over there is a completely different world. There they are much more developed. There are high-rises and resorts and homes worth a million euros. In Samos, they care about money. Here, we don't. For the many religious and cultural holidays, people pool their money and buy food and wine. If there is money left over, they give it to the poor. It's not a 'me' place. It's an 'us' place."

Ikaria's unusual past may explain its communal inclinations. The strong winds that buffet the island — mentioned in the "Iliad" — and the lack of natural harbors kept it outside the main shipping lanes for most of its history. This forced Ikaria to be self-sufficient. Then in the late 1940s, after the Greek Civil War, the government exiled thousands of Communists and radicals to the island. Nearly 40 percent of adults, many of them disillusioned with the high unemployment rate and the dwindling trickle of resources from Athens, still vote for the local Communist Party. About 75 percent of the population on Ikaria is under 65. The youngest adults, many of whom come home after college, often live in their parents' home. They typically have to cobble together a living through small jobs and family support.

Leriadis also talked about local "mountain tea," made from dried herbs endemic to the island, which is enjoyed as an end-of-the-day cocktail. He mentioned wild marjoram, sage (flaskomilia), a type of mint tea (fliskouni), rosemary and a drink made from boiling dandelion leaves and adding a little lemon. "People here think they're drinking a comforting beverage, but they all double as medicine," Leriadis said. Honey, too, is treated as a panacea. "They have types of honey here you won't see anywhere else in the world," he said. "They use it for everything from treating wounds to curing hangovers, or for treating influenza. Old people here will start their day with a spoonful of honey. They take it like medicine."

Over the span of the next three days, I met some of Leriadis's patients. In the area known as Raches, I met 20 people over 90 and one who claimed to be 104. I spoke to a 95-year-old man who still played the violin and a 98-year-old woman who ran a small hotel and played poker for money on the weekend.

On a trip the year before, I visited a slate-roofed house built into the slope at the top of a hill. I had come here after hearing of a couple who had been married for more than 75 years. Thanasis and Eirini Karimalis both came to the door, clapped their hands at the thrill of having a visitor and waved me in. They each stood maybe five feet tall. He wore a shapeless cotton shirt and a battered baseball cap, and she wore a housedress with her hair in a bun. Inside, there was a table, a medieval-looking fireplace heating a blackened pot, a nook of a closet that held one woolen suit coat, and fading black-and-white photographs of forebears on a soot-stained wall. The place was warm and cozy. "Sit down," Eirini commanded. She hadn't even asked my name or business but was already setting out teacups and a plate of cookies. Meanwhile, Thanasis scooted back and forth across the house with nervous energy, tidying up.

The couple were born in a nearby village, they told me. They married in their early 20s and raised five children on Thanasis's pay as a lumberjack. Like that of almost all of Ikaria's traditional folk, their daily routine unfolded much the way Leriadis had described it: Wake naturally, work in the garden, have a late lunch, take a nap. At sunset, they either visited neighbors or neighbors visited them. Their diet was also typical: a breakfast of goat's milk, wine, sage tea or coffee, honey and bread. Lunch was almost always beans (lentils, garbanzos), potatoes, greens (fennel, dandelion or a spinachlike green called horta) and whatever seasonal vegetables their garden produced; dinner was bread and goat's milk. At Christmas and Easter, they would slaughter the family pig and enjoy small portions of larded pork for the next several months.

During a tour of their property, Thanasis and Eirini introduced their pigs to me by name. Just after sunset, after we returned to their home to have some tea, another old couple walked in, carrying a glass amphora of homemade wine. The four nonagenarians cheek-kissed one another heartily and settled in around the table. They gossiped, drank wine and occasionally erupted into laughter.

Dr. Ioanna Chinou, a professor at the University of Athens School of Pharmacy, is one of Europe's top experts on the bioactive properties of herbs and natural products. When I consulted her about Ikarians' longevity, she told me that many of the teas they consume

are traditional Greek remedies. Wild mint fights gingivitis and gastrointestinal disorders; rosemary is used as a remedy for gout; artemisia is thought to improve blood circulation. She invited me to give her samples and later tested seven of the most commonly used herbs on Ikaria. As rich sources of polyphenols, they showed strong antioxidant properties, she reported. Most of these herbs also contained mild diuretics. Doctors often use diuretics to treat hypertension — perhaps by drinking tea nightly, Ikarians have gently lowered their blood pressure throughout their lives.

Meanwhile, my colleagues Gianni Pes and Michel Poulain set out to track down the island's 164 residents who were over 90 as of 1999, starting in the municipality of Raches. They found that 75 nonagenarians were still alive. Then, along with additional researchers, they fanned out across the island and asked 35 elderly subjects a battery of lifestyle questions to assess physical and cognitive functioning: How much do you sleep? Did you ever smoke? They asked them to get up and down from a chair five times and recorded how long it took them to walk 13 feet. To test mental agility, the researchers had subjects recall a series of items and reproduce geometric shapes.

Pes and Poulain were joined in the field by Dr. Antonia Trichopoulou of the University of Athens, an expert on the Mediterranean diet. She helped administer surveys, often sitting in village kitchens to ask subjects to reconstruct their childhood eating habits. She noted that the Ikarians' diet, like that of others around the Mediterranean, was rich in olive oil and vegetables, low in dairy (except goat's milk) and meat products, and also included moderate amounts of alcohol. It emphasized homegrown potatoes, beans (garbanzo, black-eyed peas and lentils), wild greens and locally produced goat milk and honey.

As I knew from my studies in other places with high numbers of very old people, every one of the Ikarians' dietary tendencies had been linked to increased life spans: low intake of saturated fats from meat and dairy was associated with lower risk of heart disease; olive oil — especially unheated — reduced bad cholesterol and raised good cholesterol. Goat's milk contained serotonin-boosting tryptophan and was easily digestible for older people. Some wild greens had 10 times as many antioxidants as red wine. Wine — in moderation — had been shown to be good for you if consumed as part of a Mediterranean diet, because it prompts the body to absorb more flavonoids, a type of antioxidant. And coffee, once said to stunt growth, was now associated with lower rates of diabetes, heart disease and, for some, Parkinson's. Local sourdough bread might actually reduce a meal's glycemic load. You could even argue that potatoes contributed heart-healthy potassium, vitamin B6 and fiber to the Ikarian diet. Another health factor at

work might be the unprocessed nature of the food they consume: as Trichopoulou observed, because islanders eat greens from their gardens and fields, they consume fewer pesticides and more nutrients. She estimated that the Ikarian diet, compared with the standard American diet, might yield up to four additional years of life expectancy.

Of course, it may not be only what they're eating; it may also be what they're not eating. "Are they doing something positive, or is it the absence of something negative?" Gary Taubes asked when I described to him the Ikarians' longevity and their diet. Taubes is a founder of the nonprofit Nutrition Science Initiative and the author of "Why We Get Fat" (and has written several articles for this magazine). "One explanation why they live so long is they eat a plant-based diet. Or it could be the absence of sugar and white flour. From what I know of the Greek diet, they eat very little refined sugar, and their breads have been traditionally made with stone-ground wheat."

Following the report by Pes and Poulain, Dr. Christina Chrysohoou, a cardiologist at the University of Athens School of Medicine, teamed up with half a dozen scientists to organize the Ikaria Study, which includes a survey of the diet of 673 Ikarians. She found that her subjects consumed about six times as many beans a day as Americans, ate fish twice a week and meat five times a month, drank on average two to three cups of coffee a day and took in about a quarter as much refined sugar — the elderly did not like soda. She also discovered they were consuming high levels of olive oil along with two to four glasses of wine a day.

Chrysohoou also suspected that Ikarians' sleep and sex habits might have something to do with their long life. She cited a 2008 paper by the University of Athens Medical School and the Harvard School of Public Health that studied more than 23,000 Greek adults. The researchers followed subjects for an average of six years, measuring their diets, physical activity and how much they napped. They found that occasional napping was associated with a 12 percent reduction in the risk of coronary heart disease, but that regular napping — at least three days weekly — was associated with a 37 percent reduction. She also pointed out a preliminary study of Ikarian men between 65 and 100 that included the fact that 80 percent of them claimed to have sex regularly, and a quarter of that self-reported group said they were doing so with "good duration" and "achievement."

During our time on Ikaria, my colleagues and I stayed at Thea Parikos's guesthouse, the social hub of western Ikaria. Local women gathered in the dining room at midmorning to

gossip over tea. Late at night, after the dinner rush, tables were pushed aside and the dining room became a dance floor, with people locking arms and kick-dancing to Greek music.

Parikos cooked the way her ancestors had for centuries, giving us a chance to consume the diet we were studying. For breakfast, she served local yogurt and honey from the 90-year-old beekeeper next door. For dinner, she walked out into the fields and returned with handfuls of weedlike greens, combined them with pumpkin and baked them into savory pies. My favorite was a dish made with black-eyed peas, tomatoes, fennel tops and garlic and finished with olive oil that we dubbed Ikarian stew.

Despite her consummately Ikarian air, Parikos was actually born in Detroit to an American father and an Ikarian mother. She had attended high school, worked as a real estate agent and married in the United States. After she and her husband had their first child, she felt a “genetic craving” for Ikaria. “I was not unhappy in America,” she said. “We had good friends, we went out to dinner on the weekends, I drove a Chevrolet. But I was always in a hurry.”

When she and her family moved to Ikaria and opened the guesthouse, everything changed. She stopped shopping for most groceries, instead planting a huge garden that provided most of their fruits and vegetables. She lost weight without trying to. I asked her if she thought her simple diet was going to make her family live longer. “Yes,” she said. “But we don’t think about it that way. It’s bigger than that.”

Although unemployment is high — perhaps as high as 40 percent — most everyone has access to a family garden and livestock, Parikos told me. People who work might have several jobs. Someone involved in tourism, for example, might also be a painter or an electrician or have a store. “People are fine here because we are very self-sufficient,” she said. “We may not have money for luxuries, but we will have food on the table and still have fun with family and friends. We may not be in a hurry to get work done during the day, so we work into the night. At the end of the day, we don’t go home to sit on the couch.”

Parikos was nursing a mug of coffee. Sunlight sifted in through the window shades; the waves of the nearby Aegean could be barely heard over the din of breakfast. “Do you know there’s no word in Greek for privacy?” she declared. “When everyone knows everyone else’s business, you get a feeling of connection and security. The lack of

privacy is actually good, because it puts a check on people who don't want to be caught or who do something to embarrass their family. If your kids misbehave, your neighbor has no problem disciplining them. There is less crime, not because of good policing, but because of the risk of shaming the family. You asked me about food, and yes, we do eat better here than in America. But it's more about how we eat. Even if it's your lunch break from work, you relax and enjoy your meal. You enjoy the company of whoever you are with. Food here is always enjoyed in combination with conversation."

In the United States, when it comes to improving health, people tend to focus on exercise and what we put into our mouths — organic foods, omega-3's, micronutrients. We spend nearly \$30 billion a year on vitamins and supplements alone. Yet in Ikaria and the other places like it, diet only partly explained higher life expectancy. Exercise — at least the way we think of it, as willful, dutiful, physical activity — played a small role at best.

Social structure might turn out to be more important. In Sardinia, a cultural attitude that celebrated the elderly kept them engaged in the community and in extended-family homes until they were in their 100s. Studies have linked early retirement among some workers in industrialized economies to reduced life expectancy. In Okinawa, there's none of this artificial punctuation of life. Instead, the notion of *ikigai* — "the reason for which you wake up in the morning" — suffuses people's entire adult lives. It gets centenarians out of bed and out of the easy chair to teach karate, or to guide the village spiritually, or to pass down traditions to children. The Nicoyans in Costa Rica use the term *plan de vida* to describe a lifelong sense of purpose. As Dr. Robert Butler, the first director of the National Institute on Aging, once told me, being able to define your life meaning adds to your life expectancy.

The healthful plant-based diet that Seventh-day Adventists eat has been associated with an extra decade of life expectancy. It has also been linked to reduced rates of diabetes and heart disease. Adventists' diet is inspired by the Bible — Genesis 1:29. ("And God said: 'Behold, I have given you every herb yielding seed . . . and every tree, in which is the fruit of a tree yielding seed; to you it shall be for food.' ") But again, the key insight might be more about social structure than about the diet itself. While for most people, diets eventually fail, the Adventists eat the way they do for decades. How? Adventists hang out with other Adventists. When you go to an Adventist picnic, there's no steak grilling on the barbecue; it's a vegetarian potluck. No one is drinking alcohol or smoking. As Nicholas Christakis, a physician and social scientist at Harvard, found when examining data from a long-term study of the residents of Framingham, Mass., health

habits can be as contagious as a cold virus. By his calculation, a Framingham individual's chances of becoming obese shot up by 57 percent if a friend became obese. Among the Adventists we looked at, it was mostly positive social contagions that were in circulation.

Ask the very old on Ikaria how they managed to live past 90, and they'll usually talk about the clean air and the wine. Or, as one 101-year-old woman put it to me with a shrug, "We just forget to die." The reality is they have no idea how they got to be so old. And neither do we. To answer that question would require carefully tracking the lifestyles of a study group and a control group for an entire human lifetime (and then some). We do know from reliable data that people on Ikaria are outliving those on surrounding islands (a control group, of sorts). Samos, for instance, is just eight miles away. People there with the same genetic background eat yogurt, drink wine, breathe the same air, fish from the same sea as their neighbors on Ikaria. But people on Samos tend to live no longer than average Greeks. This is what makes the Ikarian formula so tantalizing.

If you pay careful attention to the way Ikarians have lived their lives, it appears that a dozen subtly powerful, mutually enhancing and pervasive factors are at work. It's easy to get enough rest if no one else wakes up early and the village goes dead during afternoon naptime. It helps that the cheapest, most accessible foods are also the most healthful — and that your ancestors have spent centuries developing ways to make them taste good. It's hard to get through the day in Ikaria without walking up 20 hills. You're not likely to ever feel the existential pain of not belonging or even the simple stress of arriving late. Your community makes sure you'll always have something to eat, but peer pressure will get you to contribute something too. You're going to grow a garden, because that's what your parents did, and that's what your neighbors are doing. You're less likely to be a victim of crime because everyone at once is a busybody and feels as if he's being watched. At day's end, you'll share a cup of the seasonal herbal tea with your neighbor because that's what he's serving. Several glasses of wine may follow the tea, but you'll drink them in the company of good friends. On Sunday, you'll attend church, and you'll fast before Orthodox feast days. Even if you're antisocial, you'll never be entirely alone. Your neighbors will cajole you out of your house for the village festival to eat your portion of goat meat.

Every one of these factors can be tied to longevity. That's what the \$70 billion diet industry and \$20 billion health-club industry do in their efforts to persuade us that if we eat the right food or do the right workout, we'll be healthier, lose weight and live longer. But these strategies rarely work. Not because they're wrong-minded: it's a good idea for

people to do any of these healthful activities. The problem is, it's difficult to change individual behaviors when community behaviors stay the same. In the United States, you can't go to a movie, walk through the airport or buy cough medicine without being routed through a gantlet of candy bars, salty snacks and sugar-sweetened beverages. The processed-food industry spends more than \$4 billion a year tempting us to eat. How do you combat that? Discipline is a good thing, but discipline is a muscle that fatigues. Sooner or later, most people cave in to relentless temptation.

As our access to calories has increased, we've decreased the amount of physical activity in our lives. In 1970, about 40 percent of all children in the U.S. walked to school; now fewer than 12 percent do. Our grandparents, without exercising, burned up about five times as many calories a day in physical activity as we do. At the same time, access to food has exploded.

Despite the island's relative isolation, its tortuous roads and the fierce independence of its inhabitants, the American food culture, among other forces, is beginning to take root in Ikaria. Village markets are now selling potato chips and soda, which in my experience is replacing tea as the drink of choice among younger Ikarians. As the island's ancient traditions give way before globalization, the gap between Ikarian life spans and those of the rest of the world seems to be gradually disappearing, as the next generations of old people become less likely to live quite so long.

The big aha for me, having studied populations of the long-lived for nearly a decade, is how the factors that encourage longevity reinforce one another over the long term. For people to adopt a healthful lifestyle, I have become convinced, they need to live in an ecosystem, so to speak, that makes it possible. As soon as you take culture, belonging, purpose or religion out of the picture, the foundation for long healthy lives collapses. The power of such an environment lies in the mutually reinforcing relationships among lots of small nudges and default choices. There's no silver bullet to keep death and the diseases of old age at bay. If there's anything close to a secret, it's silver buckshot.

I called Moraitis a few weeks ago from my home in Minneapolis. Elpiniki died in the spring at age 85, and now he lives alone. He picked up the phone in the same whitewashed house that he'd moved into 35 years ago. It was late afternoon in Ikaria. He had worked in his vineyard that morning and just awakened from a nap. We chatted for a few minutes, but then he warned me that some of his neighbors were coming over for a

drink in a few minutes and he'd have to go. I had one last question for him. How does he think he recovered from lung cancer?

"It just went away," he said. "I actually went back to America about 25 years after moving here to see if the doctors could explain it to me."

I had heard this part of the story before. It had become a piece of the folklore of Ikaria, proof of its exceptional way of life. Still, I asked him, "What happened?"

"My doctors were all dead."

This article is adapted from new material being published in the second edition of "Blue Zones," by [Dan Buettner](#), out next month from National Geographic.

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