

# Denying to the Grave

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Why We Ignore the Facts that Will Save Us

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SARA E. GORMAN, PHD, MPH

JACK M. GORMAN, MD



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*In memory of Howard Kantor, tireless devotee of science and  
medicine, beloved father, grandfather, and husband*



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## Introduction

ON OCTOBER 8, 2014, THOMAS ERIC DUNCAN DIED IN A Dallas hospital from Ebola virus infection. From the moment he was diagnosed with Ebola newspapers all over the country blared the news that the first case of Ebola in the United States had occurred. Blame for his death was immediately assigned to the hospital that cared for him and to the U.S. Centers for Disease Control and Prevention (CDC).<sup>1</sup> By the end of the month a total of four cases had developed in the United States: two in people—including Duncan—who acquired it in African countries where the disease was epidemic and two in nurses who cared for Duncan. Headlines about Ebola continued to dominate the pages of American newspapers throughout the month, warning of the risk we now faced of this deadly disease. These media reports were frightening and caused some people to wonder if it was safe to send their children to school or ride on public transportation—even if they lived miles from any of the four cases. “There are reports of kids being pulled out of schools and even some school closings,” reported Dean Baker in the *Huffington Post*. “People in many areas are not going to work and others are driving cars rather than taking mass transit because they fear catching Ebola from fellow passengers. There are also reports of people staying away from stores, restaurants, and other public places.”<sup>2</sup> An elementary

school in Maine suspended a teacher because she stayed in a hotel in Dallas that is 9.5 miles away from the hospital where two nurses contracted the virus.<sup>3</sup> As Charles Blow put it in his *New York Times* column, “We aren’t battling a virus in this country as much as a mania, one whipped up by reactionary politicians and irresponsible media.”<sup>4</sup>

It turns out that Thomas Duncan was not the only person who died in the United States on October 8, 2014. If we extrapolate from national annual figures, we can say that on that day almost 7,000 people died in the United States. About half of them died of either heart disease or cancer; 331 from accidents, of which automobile accidents are the most common; and 105 by suicide.<sup>5</sup> About 80 people were killed by gunshot wounds the day that Thomas Eric Duncan died, two thirds of which were self-inflicted. NPR correspondent Michaelen Doucleff made a rough calculation and determined that the risk of contracting Ebola in the United States was 1 in 13.3 million, far less than the risk of dying in a plane crash, from a bee sting, by being struck by lightning, or being attacked by a shark.<sup>6</sup> The chance of being killed in a car crash is about 1,500 times greater than the risk of getting infected with the Ebola virus in the United States.

It probably comes as no surprise that there were very few front-page headlines about bee stings or shark attacks on October 8, 2014, let alone about car crashes and gun violence. Perhaps this seems natural. After all, Ebola virus infection, the cause of Ebola hemorrhagic fever (EHF), is unusual in the United States, whereas heart attacks, cancer, car crashes, suicide, and murder happen on a regular basis. The problem, however, with the media emphasizing (and ordinary people fearing) Ebola over other far more prevalent health threats is that it shapes our behavior, sometimes in dangerous ways. How many people smoked a cigarette or consumed a sugary breakfast cereal while reading about the threat they faced in catching Ebola?

Some Americans jumped on the blame game bandwagon, attacking the CDC, insisting that politicians and hospitals had dropped the ball, and accusing African countries of ignorant, superstitious behavior. In Washington, DC, one-quarter of the members of Trinity Episcopal Church stopped attending services because they feared that some fellow parishioners might have traveled to West Africa.<sup>7</sup> An Ohio bridal shop owner reported losing tens of thousands of dollars because Amber Vinson, one of two Dallas-based nurses who

tested positive for Ebola, had visited her shop. The owner closed the store during the incubation period and had the store professionally cleaned, but “a string of frightened customers cancelled their orders.”<sup>8</sup> According to a presidential commission report, “Americans focused on their own almost nonexistent risk of catching Ebola from travelers instead of pressing to help the truly affected nations.”<sup>9</sup> It is quite likely that most of these frightened Americans did not increase their exercise, cut down on eating processed foods, fasten their seat belts, quit smoking, make sure guns in the home were unloaded in locked cases, or get help for depression and alcoholism. The novelty of Ebola was exciting, like watching a horror movie. Those other causes of death are familiar and boring. In other words, Americans acted in an irrational way, overestimating the risk of Ebola and underestimating the risk of the life-threatening phenomena about which they might be able to do something. As Sara pointed out in an article she wrote that month, “What is the most effective treatment for Americans to protect themselves from early death by an infectious pathogen? A flu shot.”<sup>10</sup>

Fear of Ebola “gripped the country” after Dr. Craig Spencer was diagnosed with Ebola and was admitted to New York City’s Bellevue Hospital.<sup>11</sup> Comparing this dramatic fear about something that is not a real health threat—Ebola infection in the United States—to the more muted concern about things that really threaten our health—lack of exercise, smoking, eating sugary foods, drinking too much alcohol, not wearing seat belts, owning guns—illustrates our persistent failure to use scientific evidence in making decisions about what we do to maintain and improve our health and our lives. This drives scientists, healthcare experts, and public health officials nuts. When an educated parent refuses to vaccinate her child because she fears the vaccination will do more harm than good, these experts decry the “ignorance” of that stance and cite the reams of evidence that prove the contrary is the case. Time after time, we make decisions about the health of ourselves and our families based on emotion rather than on analysis of the scientific data. The government uses taxpayer money to mount hugely expensive studies in order to prove that the science is correct, but people come up with more and more reasons to insist that the research is incomplete, biased, or simply wrong. Opposing camps accuse each other of deliberately plotting to harm the American public, of being bought off by special

interests, and of stupidity. The data may be clear about who is right and who is wrong, but people make decisions that ignore or deny the evidence. This book is an attempt to elucidate why we do this and what we can do to make better decisions about our health and the health of our loved ones.

### *Why Do We Ignore or Deny Scientific Evidence?*

It turns out that there are many reasons for refusing to acknowledge scientific evidence when making health decisions, but stupidity is not one of them. Very smart people take positions that are not remotely based on evidence. There is a direct relationship, for example, between intelligence and refusing to vaccinate a child: this unfortunate behavior is championed mainly by very well-educated and affluent people.<sup>12</sup> What then causes smart people to make decisions and adopt positions that have no factual basis? That is the question with which this book wrestles.

The idea for this book took shape as Sara became increasingly involved in the world of public health. She was particularly mystified by the “anti-vaxxers,” people who promulgate the notion that immunizations are harmful, causing, among other things, autism. Nothing could be further from the truth. Immunization is one of the triumphs of modern medicine, having eliminated from our lives deadly diseases such as smallpox, measles, polio, and diphtheria. It is based on elegant scientific principles, has a remarkable safety record, and absolutely does not cause autism. How could anyone, Sara wondered, refuse to vaccinate a child?

At the same time Jack, who trained as a psychiatrist and worked as a scientist most of his career, was increasingly interested in the reasons people own guns. He thought at first it was for hunting and decided that just because it was a hobby that neither he nor any of his New York City friends pursued, it would be wrong to advocate that all the people who enjoy shooting animals in the woods be prevented from doing so. But a look at the data showed that a relatively small number of Americans are hunters and that most gun owners have weapons for “protection.” Yet studies show over and over again that a gun in the house is far more likely to be used to injure or kill someone who lives there than to kill an intruder. Gun availability is clearly linked to elevated risk for both homicide and suicide.<sup>13</sup> Statistically

speaking, the risks of having a gun at home are far greater than any possible benefits. Consider the tragic case of 26-year-old St. Louis resident Becca Campbell, who bought a gun reportedly to protect herself and her two daughters. Instead of protecting herself and her family from risks such as the Ferguson riots, she wound up accidentally shooting and killing herself with it.<sup>14</sup>

In both cases scientific evidence strongly suggests a position—vaccinate your child and don't keep a gun at home—that many of us choose to ignore or deny. We make a distinction between “ignore” and “deny,” the former indicating that a person does not know the scientific evidence and the latter that he or she does but actively disagrees with it. We quickly generated a list of several other health and healthcare beliefs that fly directly in the face of scientific evidence and that are supported by at least a substantial minority of people:

- Vaccination is harmful.
- Guns in the house will protect residents from armed intruders.
- Foods containing genetically modified organisms (GMOs) are dangerous to human health.
- The human immunodeficiency virus (HIV) is not the cause of AIDS.
- Nuclear power is more dangerous than power derived from burning fossil fuels.
- Antibiotics are effective in treating viral infections.
- Unpasteurized milk is safe and contains beneficial nutrients that are destroyed by the pasteurization process.
- Electroconvulsive therapy (ECT, or shock treatment) causes brain damage and is ineffective.

Throughout this book we present evidence that none of these positions is correct. But our aim is not to exhaustively analyze scientific data and studies. Many other sources review in rigorous detail the evidence that counters each of these eight beliefs. Rather, our task is to try to understand *why* reasonably intelligent and well-meaning people believe them.

Many of the thought processes that allow us to be human, to have empathy, to function in society, and to survive as a species from an evolutionary standpoint can lead us astray when applied to what scientists refer to as *scientific reasoning*. Why? For starters, scientific reasoning is difficult for many people to accept because it precludes

the ability to make positive statements with certainty. Scientific reasoning, rather, works by setting up hypotheses to be knocked down, makes great demands before causality can be demonstrated, and involves populations instead of individuals. In other words, in science we can never be 100% sure. We can only be very close to totally sure. This runs counter to the ways we humans are accustomed to thinking. Moreover, science works through a series of negations and disproving, while we are wired to resist changing our minds too easily. As a result, a multitude of completely healthy and normal psychological processes can conspire to make us prone to errors in scientific and medical thinking, leading to decisions that adversely affect our health.

These poor health decisions often involve adopting risky behaviors, including refusal to be vaccinated, consumption of unhealthy food, cigarette smoking, failure to adhere to a medication regimen, and failure to practice safe sex. We believe that these risk-taking behaviors stem in large part from complex psychological factors that often have known biological underpinnings. In this book we explore the psychology and neurobiology of poor health decisions and irrational health beliefs, arguing that in many cases the psychological impulses under discussion are *adaptive* (meaning, they evolved to keep us safe and healthy), but are often applied in a *maladaptive* way. We also argue that without proper knowledge of the psychological and biological underpinnings of irrational health decisions and beliefs, we as a society cannot design any strategy that will alleviate the problem. We therefore conclude by offering our own method of combatting poor health decision making, a method that takes into account psychology and neurobiology and that offers guidance on how to encourage people to adopt a more scientific viewpoint without discounting or trying to eliminate their valuable emotional responses.

We will assert many times that the problem is not simply lack of information, although that can be a factor. Irrational behavior occurs even when we know and understand all the facts. Given what we now understand about brain function, it is probably not even appropriate to label science denial as, strictly speaking, "irrational." Rather, it is for the most part a product of the way our minds work. This means that simple education is not going to be sufficient to reverse science denial. Certainly, angry harangues at the "stupidity" of science denialists will only reify these attitudes. Take, for example, a recent article in *The Atlantic* that discussed affluent Los Angeles

parents who refuse to have their children vaccinated, concluding, “Wealth enables these people to hire fringe pediatricians who will coddle their irrational beliefs. But it doesn’t entitle them to threaten an entire city’s children with terrifying, 19th-century diseases for no reason.”<sup>15</sup> This stance is unhelpful because it attempts to shame people into changing their beliefs and behaviors, a strategy that rarely works when it comes to health and medicine. As Canadian scientists Chantal Pouliot and Julie Godbout point out in their excellent article on public science education, when scientists think about communicating with nonscientists, they generally operate from the “knowledge deficit” model, the idea that nonscientists simply lack the facts. Evidence shows, these authors argue instead, that nonscientists are in fact capable of understanding “both the complexity of research and the uncertainties accompanying many technological and scientific developments.”<sup>16</sup> Pouliot and Godbout call for educating scientists about social scientists’ research findings that show the public is indeed capable of grasping scientific concepts.

Each of the six chapters of this book examines a single key driver of science denial. Each one of them rests on a combination of psychological, behavioral, sociological, political, and neurobiological components. We do not insist that these are the only reasons for science denial, but through our own work and research we have come to believe that they are among the most important and the most prominent.

### *Just Because You’re Paranoid Doesn’t Mean People Aren’t Conspiring Against You*

In chapter 1, “Conspiracy Theories,” we address the complicated topic of conspiracy theories. Complicated because a conspiracy theory is not *prima facie* wrong and indeed there have been many conspiracies that we would have been better off uncovering when they first occurred. Yet one of the hallmarks of false scientific beliefs is the claim by their adherents that they are the victims of profiteering, deceit, and cover-ups by conglomerates variously composed of large corporations, government regulatory agencies, the media, and professional medical societies. The trick is to figure out if the false ones can be readily separated from those in which there may be some truth.