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We All Have a Green Heart

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Editor's note: This story won the Predictive Analytics and Futurism Section prize for most novel prediction forming the basis for the narrative in the 2019 Actuarial Speculative Fiction contest, which our section co-sponsors every two years. You can read all the contest entries at <https://www.soa.org/sections/2019-speculative-fiction-contest/>.

“We are engaged in a contest for the most *interesting* documentary about the reversal of climate change, and she wants us to interview an *actuary*?” James inquired incredulously as we left our boss’s office with a large camera on a tripod leaning heavily on his shoulder.

“They can’t all be socially awkward, can they?” Lisa asked, twirling reflectors nervously in her hands.

“Does it matter? I’ve heard they don’t like social interaction,” James insisted. “And we’re supposed to put one in front of a camera for millions to see!”

I reached my desk and relieved my arms of audio equipment. A newspaper had crushed the haphazard notes strewn across my work area, its headline screaming “CLIMATE CHANGE HAS BEEN REVERSED.” I straightened and looked at my two colleagues. “This all started with an insurance company,” I stated, pointing at the newspaper. “Now, I know it may not seem very exciting, but I think it could be a unique and efficient way to explain how it all began, don’t you think? The other teams might be using celebrities or miracles or fluffy animals or whatever they can think of, but we’re going to get to the place where it all started.”

James raised an eyebrow. “You mean a cubicle?”

“Um ... exactly!” I grabbed my purse and phone. “Let’s get our stuff in bags and get on the train. This is going to be great! We just ... We just have to find the right actuary!”

Following the high-speed train ride from New York to Minneapolis, a few calls, a brainstorming session and an overnight stay in a hotel, my team and I hopped on the subway in the

direction of Green Heart Life Insurance Company for the first day of filming. Green Heart was located in a net-zero building downtown, surrounded by bike paths, walking streets and green spaces.

My team set up in a decent-sized conference room, and the first potential interviewee was a corporate actuary.

“Hello, Mr. Beckman. Thank you for talking to us,” I told him as he shifted in his chair across the table. “My cameraman, James, will position himself here, but I want you to look at me while you’re answering the questions, not into the camera. My assistant, Lisa, will control the lighting; don’t mind her. Are you comfortable?”

Mr. Beckman looked at anything but my eyes and nodded.

“All right, please look at me when you are answering the questions. I’ll just ask you one question as a test, and then we will contact you again if we want you to be more involved in our project. The first question is: Why did an insurance company get involved in the climate change revolution? What’s in it for you?”

“In the simplest terms,” he began, staring at the table, “insurance companies and customers have the same goal: to have policyholders live longer. Let’s take a simple whole life insurance contract. The customer or policyholder pays the insurance company a certain amount of money—called a premium—every year until they die. When the policyholder dies, the insurance company pays a lump sum to the policyholder’s beneficiary—spouse, child, etc. So the longer the policyholder lives, the more premiums they will pay to the insurance company to offset the cost of paying the lump sum at death. Insurance companies want the policyholders to live longer so that they will receive more money. And policyholders? Well, policyholders also want to live longer because everyone wants to live longer. Same goal!”

After Mr. Beckman had left, I shrugged at my crew. “Great answer, zero eye contact.”

The next actuary worked in life insurance.

“We’ve been able to lower UEP amounts for WL, UL, VUL, everything, since the U.S. LE is so much longer. The SOA and AAA worked together on the studies we needed. The NAIC’s SVL within the VM uses PBR, so CRVM and CARVM were adjusted accordingly. Once the CSO table was updated, we were good to go! LT9 is our cheapest product yet!”

I shook my head.



A director in the annuities area named Mr. Phillips was the next interviewee.

“It’s called nudging. You track a certain aspect of someone’s life as a basis for the amount of premium they pay, and they will improve that aspect of their life. For example, back when people drove cars ...” Everyone laughed. “An insurance company could have the policyholder place a monitor in their car to track how they drive. The better they drove, the better their premium, so they drove better! It’s the same idea with our Green Heart program. We’ve since renamed our company to match the program. We encourage climate-saving and health-saving behaviors that will lengthen the policyholder’s lifespan. Then for life insurance, we are able to charge lower premiums because people are expected to live longer. Thus, policyholders are nudged toward that beneficial behavior.

“The life insurance side is where most of the creative process took place, but I can also explain how my area—annuities—benefits from longer life expectancies. I’m going to need a break though. Being around people and cameras drains my energy.”

“You’ve been here for two minutes.”

The actuary nodded. “Yes, that’s about my limit.”

I put my head in my hands.

The next candidate was another life actuary, this time a cheery woman in her 30s with wavy red hair and a brilliant smile. She greeted the three of us with a direct handshake and eye contact that was neither flickering nor unwavering. She sat down, nodded at the directions, and looked at me when I asked the first question.

“Hello, can you give us your name and what you do here at Green Heart?” I felt good about this one, so I approached the questions not as a test but rather as if I was doing the real thing.

“My name is Brooke Piper, and I work in life insurance to create and price new products.”

“What is it that makes something like life insurance the perfect vehicle for helping the fight against climate change?”

Brooke gave an answer similar to her colleagues’ answers and then proceeded to expand on it: “The connection between some of the lifestyle changes our Green Heart program encouraged and long lives was easy to see and thus easier to encourage. The effects of other lifestyle changes were more difficult to see because it would take a lot of people to make any difference, and that difference would be slow to take effect and probably not very noticeable. Those lifestyle changes were hard to encourage, not only because they were difficult to see personally but also because we couldn’t afford to lower premiums all that much in

reward for the changes. However, there were two reasons we were able to make a difference.

“One was that global warming was already increasing mortality—and would continue to increase it. Even in the United States, droughts, wildfires, extreme weather patterns like hurricanes and storms, flooding on the coasts, and very high or very low temperatures are going to cause a lot of deaths. My insurance company covers people across the country, and the mortality of our policyholders is bound to be affected.

“Two was that climate change was a global crisis, and it was going to affect the health and well-being of everyone. My company is a charitable organization that encourages workers, members and the community to donate time and money to people in need. The people most affected by the effects of global warming were going to be impoverished people in third-world countries that don’t have the infrastructure to stand against extreme weather or the resources to adapt to a changing climate. A lot of the initiatives that came out of the Green Heart program were based on helping those who couldn’t help themselves. A lot of people are going to step up to the plate if they believe they are helping themselves, their future generations, and those in need.”

I was nodding, taking only a split-second to smile at my team. Brooke had made excellent eye contact, had explained her thoughts in a way that was easy to understand, and had spoken for longer than two minutes. She could be the actuary we needed.

I picked out the next question from my notes. “Can you give me examples of some of these ‘initiatives’ you mentioned? Which were the hardest, and which were the easiest in terms of encouragement by lower premiums or in principle?”

Brooke didn’t even glance down at her own notes; she had come prepared. “There were four types of initiatives: individual health, individual responsibility, consumer-voter power (CVP), and global caretaker.

“Individual health was the easiest to implement. It involved lifestyle changes that were beneficial both to the environment and to physical well-being in the short term, and these changes could be tracked and rewarded. An example would be a whole foods, plant-based, and low-waste diet. A plant-based or vegan diet involves consuming no animal products, which saves the planet from deforestation, inefficient use of land and water, and large quantities of methane gas and nitrous oxide, which trap heat in our atmosphere. The addition of “whole foods” and “low waste” means that people won’t turn to processed vegan junk food in plastic wrappers but instead focus on bulk grains, fruits, vegetables and plant-based protein. We also encouraged the purchase of GMOs and discouraged the purchase of organic foods. This

specific diet was tracked by both receipts and epigenetic markers, and it was rewarded with lower premiums. People found that this diet was much cheaper than they expected, lowered their health care bills, and lowered their life insurance premiums, so the savings were enormous. Other examples of individual health initiatives included proper sleeping habits; reducing technology use; lowering thermostats in the winter for a cooler sleep; short, warm—not hot—showers; adequate exercise; walking or biking to the store or work; and mental well-being (yoga, meditation and outdoor activities) rather than video games and social media. These could be tracked by receipts, epigenetics, house water and electricity usage, Fitbits, etc.

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“The individual responsibility initiative was more difficult, because we had to come up with creative ways to track both individual behavior and price based on slow, barely discernible changes. One example would be composting. Food that is placed in the garbage to go to a landfill is not going to get the oxygen it needs to break down, so it basically just becomes another piece of trash. But how could we track how much people composted? Well, we decided to team up with local garbage and compost companies. People put out three bins on their driveways: one for trash, one for recycling, and one for compost. The trucks weigh the contents of the bins each week when they take them away, and we charge premiums based on the ratios of compost to trash. We don’t directly encourage recycling because we’d rather people use no packaging at all, but it’s better to recycle than it is to put it in the trash and lower the ratio. Anyway, this kind of initiative was difficult to value, but my company is great at focusing on the long term, and there are real savings down the road. Other examples of individual responsibility initiatives included solar panels, clean cooking, electric cars or mass transit, insulation, LED lighting, bamboo, water saving, etc. These are all things that don’t affect health directly yet should be encouraged.”

Brooke took a drink from her stainless-steel water bottle. “The consumer-voter power, or CVP, initiative was an education program based on the power individuals have as consumers and as voters. It involved extensive research into environmentally friendly, ethical brands as well as endorsement of candidates in political races that would fight to implement policies that individuals can’t control, such as a carbon tax, construction of wind turbines and nuclear power plants, elimination of harmful

chemicals such as those used in refrigeration, etc. Essentially, the CVP initiative became an organization involved in informing via website, campaigns and advertising, and all of this information was backed by extensive, peer-reviewed research easily found by links and references.

“And finally, the global caretaker initiative was focused on the No. 1 solution to climate change: empowering women. It sounds a little weird, but the idea is that the more people we have on this earth, the more carbon emissions we produce. If girls, especially in third-world countries, receive school and family planning education, they will have fewer kids, and the growth in the world population would slow to a more manageable rate. Also, more education usually leads to better health. Thus, the global caretaker initiative was about donating money and time to education and family planning throughout the world.

“As you can see, part of the program was directed toward lifestyle changes that would be rewarded with lower premiums, and part of the program involved political or charitable actions that would be rewarded with the joy of helping someone in need and preserving our planet.”

I appreciated the thorough answer and gave Brooke a moment to collect herself before I asked the next question: “You mentioned epigenetics. This was kind of a new field at the time the Green Heart program launched. Can you explain a bit more about it?”

“Genetics is about DNA being passed down from parents, and these genes cannot change throughout a lifetime. Epigenetics is studying how lifestyle and environment can actually switch genes on and off or affect how cells read genes. So diet, sleep, exercise ... stress ... and also environmental factors like pollution can provoke change in gene activity and expression. This happens through a mechanism called methylation. Insurance companies use various DNA collection methods to determine a person’s ‘epigenetic age,’ or an estimation of one’s biological age based on DNA methylation patterns, and they can price their products based on that age. Epigenetics was an exciting innovation for insurance companies.”

“What were the biggest issues the Green Heart program faced?”

“Number one was getting the data. Actuaries use historical data to predict the future, but there wasn’t a whole lot of data out there about some of the changes we were trying to implement. It took a lot of collaboration with underwriters, data scientists and medical professionals to find the best data at the time and start new studies. Unfortunately, though, new studies were both long in process and small in statistical significance. Something like diet is extremely hard to do a good study on, because there are so many other factors, and the change in mortality is so small

at younger ages. Actuaries had the final say on assumptions, and they had to be diligent in tracking progress and changing those assumptions if need be.

“The second biggest issue was fairness. How do we make it so that everyone has access to green behavior? Gas was cheap; electric cars were not. Fast-food burgers were cheap; fresh vegetables not so much. Air quality was worse in low-income areas. The Green Heart program was all about not faulting people for things they couldn’t control but rather rewarding positive changes. In the case of equal access to healthy, green behavior, it was necessary for the government to step in. The CVP initiative promoted taxes on things like carbon and unhealthy foods while subsidizing the electric car/pod industry and healthy foods.”

“How about the so-called ‘skeptics’? Not everyone believed in climate change or pushed back against some of the solutions to climate change.”

Brooke nodded. “Monetary benefits helped for climate change skeptics, and helping girls get education is not difficult to convince people is beneficial in every way. For some of the solutions, especially nuclear power and GMOs, it took extensive research and study summaries to convince people that these solutions are not problematic and are, in fact, necessary. Some people still weren’t convinced, and that’s something we had to live with and find common ground somewhere else.”

“Was Green Heart able to find common ground with other insurance companies?”

“The larger the number of people who participate in these green behaviors, the better the effects on mortality would be. It took a large coalition of life insurance companies to start making a difference; we just got the ball rolling. Additionally, this push for a green lifestyle expanded well beyond life insurance to car insurance, health insurance ...”

“To beyond insurance.”

“Right. To investors, which is really where the change started happening. Companies approved by our CVP initiative began to receive more funding and spread across the country, offering access to environmentally friendly goods and services. The biggest limitations to a movement are convenience and tradition. Those barriers were eliminated when everyone had access and green became normal.”

“Expected, even.”

“And soon to be required, due to CVP-backed politicians putting green into law.”

I flipped a page of my notes. “How has the actuarial career changed?”

Brooke smiled. “From what I understand, the fundamentals have not changed: Actuaries are a group of smart people armed with facts and statistics, making assumptions only when necessary and always geared toward conservatism rather than risk. The difference now is increased reliance on actuarial judgment (we had to make a lot of decisions very quickly and never with as much data as we would like)—also recognition and the expansion of topics. Instead of people trusting actuaries only to price their insurance products, now they are trusting actuaries to count unbiased studies, to point out flaws in data collection, to plot the rise in earth’s temperature and extreme weather patterns, to independently analyze a budget. We have to be thorough, detail-oriented, adaptable, well-rounded, passionate, skeptical and open-minded as well as able to explain our complicated findings in simple terms. Our reputation is high caliber, because we take only high-caliber people.”

“Is it hard to attract high-caliber people to the Minnesotan tundra?”

“Once someone figures out self-driving pods in the snow, no problem!”

We asked more questions, using up as much time as Brooke could allow in her schedule, until we had more than enough material to get a good start on the project. We promised her that we would probably be back to film more once we figured out more of the documentary’s details but that we were planning on structuring the film around her interview answers. We got lunch, our brains brimming with ideas, and even James was convinced we could work with the actuary footage. We then spent the afternoon filming establishing shots of Minneapolis: the Stone Arch Bridge, walking streets, the subway, solar panels, the Sculpture Garden, wind turbines, the city’s nuclear power plant, the surrounding farms, etc.

On the overnight high-speed train ride back to New York, we cut together a few decent clips to show to the boss for approval. With coffee running through our veins, we burst into Megan’s office in excitement and showed her our initial work. The first was a set of contrasting videos showing footage from around the early 2000s tied together with footage we had shot just the day before. From a greasy McDonald’s hamburger to a standard plant-based grain bowl, from a car running on gas to a pod running on electricity, from a coal plant to a nuclear power plant, and many more in rapid succession. The next piece was a set of graphs and pictures with Brooke’s voice narrating how one small part of the program worked. The final piece was Brooke in

the conference room with a few inspirational images scattered throughout.

My voice was first. “We are now years down the road, and it’s just been announced that climate change has been reversed. How important was your company’s Green Heart program in that miraculous reversal?”

Brooke was magnetic in look and delivery. “Humans were the ones who caused climate change, and humans were the ones who had to change to reverse it. This had to happen on an individual level, a company level and a national level. The Green Heart program tackled each of those things in a cost-effective, evidence-backed and trustworthy way. We got the ball rolling, but more importantly, everyone did their part.”

The clip ended, and I looked to my boss for approval. A smile lit Megan’s face.

“Wonderful, wonderful. How many actuaries did you interview?” she asked.

“We tested three before settling on Brooke, who you saw in the clip,” I answered. “She impressed us from the start.”

Megan leaned forward in her chair. “Tested? Settled? Are you saying you’re building an entire documentary around this Brooke woman?”

“Well, um ... she’s the foundation. We’re going to supplement her with some experts in the topics she brings up.”

Megan shook her head. “I said to *start* with an actuary. Just like climate change wasn’t reversed by one person, this Green Heart program wasn’t engineered by one person. I want more actuaries.” I opened my mouth to protest, but Megan continued, “I also want different areas of the company. The actuaries may have figured a lot of this stuff out, but there’s a lot of people supporting them along the way.” She seemed to be moving toward a better idea for the documentary. “Climate change was a group effort. It’s everyone’s responsibility.” She glanced at Brooke’s face on the paused screen. “Brooke can be your star, but I want this documentary to show that the fight for a cleaner, greener society doesn’t go anywhere without a lot of good people joining in.”

James, Lisa and I nodded, and we got to work. Just like the environmental efforts, our documentary went from the initial idea and grew outward. We had the start: life insurance. For the next step, we went back to the annuity actuary.

“You’ve got two minutes,” Mr. Phillips and I said in unison, and we both laughed.

“In its simplest form,” he began, “an annuity is purchased by someone with a lump sum and then pays that person an amount back every month or year for a certain number of years or until they die. So a person might purchase an annuity for a million dollars and receive \$5,000 every month. It could be an investment; it could be guaranteed income ... *Or* it could be insurance against living too long, also called a payout annuity. With a longer life expectancy, yes, an insurance company is going to have to lower benefits a little bit to offset the number of payments they will have to make to the policyholder. However, people will want to reduce the risk of living longer than they can afford, so they will purchase more payout annuities. People live longer, and insurance companies get more business. Win-win!”

My team expanded our interview pool to include people from areas across the company that assisted in the Green Heart program. The marketing area rebranded the company, the investments area assisted with and followed CVP investment approval, and the HR department trained employees on company changes and green habits. We spoke to underwriters; the medical director; and a variety of architects, solutions engineers and developers in IT.

An underwriter: “Underwriters research and assess the risk of a potential policyholder. We look—in any way we can—at age, health, lifestyle, occupation, family medical history, hobbies, etc. If someone is too risky or unhealthy, we don’t give them coverage. If someone is less risky or healthier than average, we give them discounted premiums. My area was essential for giving the Green Heart program’s ‘discounts.’ We had to alter underwriting requirements to include diets, energy usage, transportation and a lot more. Epigenetics was a hugely important change to the underwriting profession.”

The medical director: “The medical director role was pivotal in locating as much relevant information as possible—like keeping up to date with the latest in medical journals—and guiding the company in research, in training and in developing underwriting guidelines.”

An application engineer: “The IT area was essential for creating new software architecture and improving existing software to handle the new data coming in and the frequent tweaks in product features as all the kinks were worked out.”

Then we talked to a few people at the first insurance companies to follow Green Heart’s lead. The more insurance companies involved, the more studies could be done and the greater the impact. After that, we spoke with individual investors, local businesses and, finally, Minneapolis residents. The younger people of the next generation were already on to the next fight, so we

kept only a clip of a 5-year-old girl shouting, “I am a global citizen!”

The documentary came together nicely, and Megan joyfully submitted it to the contest.

After much deliberation, the results were in, and the top three [films] were announced via the homepage of the contest website.

As we waited for results, I nervously went to the contest website to watch some of the trailers the entrants had to make. Ours was near the bottom alphabetically: *We All Have a Green Heart*. I recognized a few of the filmmakers’ names as industry peers and clicked on any trailer that intrigued me. One traveled across the world to get stunning footage of pieces of nature saved by climate-change reversal. One was about the progression of Man-BearPig in a series of interviews with the creators of *South Park*.

Then I clicked on the one I was convinced would win. Great footage, powerful message and, most importantly ...

“Narrated by Matt Damon? Dang it!” James exclaimed when I showed him the video. “We don’t stand a chance!”

After much deliberation, the results were in, and the top three were announced via the homepage of the contest website. James, Lisa and I hovered behind Megan’s chair, our eyes flying left to right across her computer screen.

The judges have chosen the top-three documentary films that show the reversal of climate change in a way that will inspire generations to come.

The third-place film shows the world as it is, as it was, and as it could have been. There are haunting images of the harm humankind had caused, brilliantly animated scenes of the path humans were headed down, and beautiful shots of what we see today that we have saved from almost certain destruction. The filmmakers have allowed the images to do the talking, and the message is clear and powerful. People will see what has been saved, and they will want to continue to save it. Although its silence is not marketable to a wider audience, this film is an important exploration into what has been accomplished.

Third Place: Is, Was, and Could Have Been

The second-place film is as entertaining as it is informative. History comes alive through interviews and dramatizations. With a

well-known narrator, slick editing, and modern pop hits, this film will appeal to the masses. The message is glaring. We have come back from destruction, but we must hold each other accountable to never slip into our old ways.

Second Place: Our Responsibility

“That was the Matt Damon one!” James exclaimed.

Megan’s mouse hovered, ready to scroll down to the No. 1 choice.

“It has to be *ManBearPig*,” Lisa murmured.

“*We Got Serious?*” Megan inquired.

“No, it’s *We Got Cereal*,” James corrected.

“Just scroll!” I snapped.

The winning film goes beyond the history book to capture the heart behind the reversal of climate change, a reversal considered to be the greatest unifying achievement humankind has ever seen. This

documentary not only highlights the incredible actions of the unsung heroes, a determined group of actuaries that started a movement based on logic and statistics, but also shows the spread of responsibility over time. Climate change did not reverse overnight, and it did not need just a single advocate. This film shows that the best leaders defer to those that know better; the best citizens are both skeptical and open-minded, and everyone must work together to heal the wounds we cause.

First Place: We All Have a Green Heart

We all looked at each other, barely restraining giddy squeals. Brooke called to congratulate us, and we thanked her in return for grounding our ambitious film. Later that night, we all raised a toast.

“To saving the planet, and to actuaries!” ■



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