

# VIRAL

BY ROBIN COOK

## PREFACE

The Covid-19 pandemic has thrust the virus center stage as a dangerous and dreaded foe similar to the way the influenza pandemic did a century ago. The causative viruses, SARS-CoV-2 and Influenza A H1N1, produce respiratory illnesses that are easily transmittable person-to-person and thereby quickly swept around the globe. Within months, both scourges sickened millions of people, and many died.

Although these two biologic entities currently dominate the spotlight, there are other viruses that deserve equal fear, concern, and attention since some of the resultant diseases have a higher lethality as well as the capacity to cause more serious complications. Although these diseases are not transmitted by aerosol and are thereby less communicative, they too are spreading around the world at a slower yet ever quickening pace thanks to climate change and human encroachment into previously isolated environments. In particular, a number of viruses have cleverly hijacked the mosquito to ensure their survival. These viruses are responsible for illnesses such as yellow fever, dengue, West Nile fever, and an array of diseases that cause dangerous inflammation of the brain called encephalitis. This includes Eastern Equine Encephalitis virus or EEE, which is known to have a death rate as high as 30%. As climate change advances, aggressive mosquitos like the Aedes Asian Tiger Mosquito, which carry these dangerous viruses and which had heretofore been restricted to tropical climes, are

progressively and relentlessly spreading northward into temperate regions, currently reaching as far north as the state of Maine in the USA and the Netherlands in Europe.

These other, fearful viruses couldn't have picked a better vector. As obligate bloodsuckers to enable breeding, mosquitoes are high on everyone's nuisance list. Most people can recall a disrupted summer slumber, or evening stroll, or hike in the woods, or barbecue on the beach, heralded by the characteristic whine of the female mosquito. As a creature superbly designed after almost one hundred million years of adaptive evolution (even dinosaurs were plagued by mosquitoes), the female mosquito invariably gets her blood meal or dies trying. For some reason that has yet to be explained, the female Asian Tiger mosquito is particularly attracted to human females with blood type O, although other blood types or even human males will do in a pinch.

As a testament to the effectiveness of the mosquito-pathogen partnership, almost a million people die each year from a mosquito spread illness. Some naturalists even posit that mosquito transmitted illnesses have killed nearly half of all the humans who have ever lived.

Robin Cook, M.D.

# VIRAL

## PROLOGUE

Although mosquitos cause more than two thousand human deaths every day, their pernicious impact doesn't necessarily stop there. The deaths they cause can result in further serious societal complications. Such a story of a sad serial tragedy started in the summer of 2020 as the result of a cascading series of events that began in the idyllic town of Wellfleet, Massachusetts, nestled on the bayside of Cape Cod. It all started within the confines of a discarded automobile tire leaning up against a dilapidated, free standing garage. Inside the tire was a bit of stagnant rainwater where a pregnant female Asian Tiger mosquito had deposited her raft of eggs.

On the 20<sup>th</sup> of July this clutch of eggs hatched, starting the mindboggling ten-day metamorphosis from larvae, to pupae, to adults. The moment the mosquitoes emerged as adults, they could fly, and within three days they followed the irresistible urge to reproduce, requiring the females to obtain a blood meal. By using their highly evolved sense organs they detected a victim and zeroed in on an unsuspecting Blue Jay. Unknown to the mosquitos and to the Blue Jay, the bird had been infected earlier in July by the Eastern Equine Encephalitis virus. Neither bird nor the mosquitos cared since birds such as Blue Jays are a normal host for EEE, meaning they live together in a kind of passive-parasitism, and in a similar fashion, the mosquito's immune system keeps the virus at bay. After getting their fill of Blue Jay blood, the mosquitos flew off to find an appropriate place to deposit their eggs.

Several weeks later the infected band of mosquitos had moved eastward toward the Atlantic Ocean. They were now considerably reduced in number from having been prey to numerous predators. At the same time, they were now more experienced. They had learned to favor human victims as easier targets than feathered birds or furred mammals. They also learned the beach was a promising destination in the late-afternoon-early-evening because there were always relatively immobile humans with lots of exposed skin.

At three-thirty on the afternoon of August 15<sup>th</sup> this cluster of EEE carrying female Asian Tiger mosquitos awakened from their daytime slumber. They had found refuge from the midday summer sun beneath the porch planking of a building on Gull Pond. A few moments later, ravenous for a blood meal, the swarm became airborne en masse with their characteristic whine. Save for several unlucky individuals, they avoided the many sticky and dangerous spider webs to emerge into the sunlight. Regrouping, they set off like a miniature fighter squadron. Instinctively they knew the beach was 600 yards to the east beyond a forest composed mostly of Black Oak and Pitch Pine. Baring being eaten on the way or having to navigate a stronger than usual headwind, it would take the swarm around three-quarters of an hour to reach a crowd of potential targets.

# BOOK 1

## CHAPTER 1 – AUGUST 15

“Okay, you guys! It’s 4:30 and time to get this barbecue show on the road,” Brian Yves Murphy ordered, clapping his hands to get his family’s attention. His wife, Emma, and his daughter, Juliette, were draped over the living room furniture in the modest two-bedroom cottage they had rented for two weeks across from a hardscrabble beach in Wellfleet, Massachusetts, just beyond the town’s harbor. All of them were appropriately exhausted after an active, fun-filled mid-summer day that marked the beginning of their final week of vacation. Because of the SARS-COV-2 pandemic, they’d opted for a road trip vacation rather than flying down to Florida to use Emma’s parents’ empty condo, as was their usual summer getaway.

“Can’t we just recover for ten to fifteen minutes?” Emma pleaded jokingly despite knowing full well that Brian wouldn’t hear of it. In truth, she was as compulsive as he in terms of getting the most out of every minute of their vacation while the weather held. On top of that, she was also as compulsively fit and active as he. That very morning Emma had awakened just after dawn and had soundlessly slipped out of the house for a morning bike ride and to be first in line at PB Boulangerie for their one-of-a-kind, freshly baked almond croissants. It had been a welcome surprise when they discovered the French bakery so far from what they called civilization. As life-long residents of Inwood, Manhattan, they considered themselves quintessential New Yorkers and assumed anything outside of the city was essentially hinterland.

“Sorry, but no rest for the weary,” Brian said. “I’d like to get to the Newcomb Hollow Beach parking lot before the evening rush to make sure we get a spot.” They had found over

their first few days that Newcomb Hollow was their favorite Atlantic side beach, with fewer people and high dunes that acted as partial windbreaks from the onshore breeze.

“But why the rush?” questioned Emma. “We already got a beach parking permit when we got the fire permit.”

“The parking permit lets us park, but it doesn’t guarantee a spot. Plus, Newcomb Hollow Beach is a popular spot for obvious reasons.”

“Okay,” Emma said agreeably. She got up and stretched her shoulders.

They were mildly sore from the kayaking on Long Pond they had done that morning, an unusual workout for both of them. Then in the early afternoon she and Brian had done their daily mini-triathlon that involved biking ten miles to Truro and back, swimming for one mile in the bay, and running for five more into the Cape Cod National Seashore. Meanwhile, four-year old Juliette had spent time with a local high school girl named Becky whom they had luckily found to serve as a daily sitter on day one. The lucky part was that Becky, despite being a teenager, was surprisingly acceptive and attentive to the required testing, mask wearing, and social distancing mandated by the Covid-19 pandemic.

“I’ll get towels, the grill, briquettes, beach chairs and toys and load it all in the car,”

Brian rattled off, heading into the kitchen. He’d been looking forward to the barbecue for several days. Although they wouldn’t have the sunset like they did every evening over Cape Cod Bay, the Atlantic side was glorious, especially compared to the narrow, seashell littered beach in front of their cottage.

“Ten four,” Emma said. She glanced down at Juliette. The child seemed to already be asleep although Emma was aware she could be pretending as she often did when she didn’t

want to be bothered. With her eyes closed and lips slightly parted, she was clutching her favorite toy and constant companion named 'bunny:' a a foot long, very floppy, light brown, worse-for-wear stuffed rabbit with one missing eye. Emma couldn't help but stare at her with loving eyes, thinking as a mother that Juliette might very well be the world's most beautiful child with her slightly upturned sculpted nose, cupid's bow lips, and thick blond hair.

Initially both Emma and Brian had been taken aback by their daughter's hair as it grew in. The expectation had been that it would either be Emma's flaming red or Brian's blue-black. Instead it had come in as blond as golden corn, establishing from the outset that Juliette was her own person. The same thing happened with her eye coloration. She ended up green-eyed in contrast to Emma's hazel and Brian's blue. But there were some definite commonalities. All three Murphys had pale, almost translucent, Irish skin that required constant application of sunscreen to keep from getting burned. Also similar was their well-muscled and long-limbed figures. Even at age four, Juliette promised to be as athletic and tall as both her father and mother who stood at six-one and five-eight respectfully.

"Hey! What are you doing?" Brian questioned as he wheeled a small portable kettle charcoal grill through the living room. He'd caught Emma hovering over Juliette. "Chop chop! What's holding up the show?"

"I was just momentarily overwhelmed by our daughter," Emma confessed. "We are so lucky she's healthy and so damn cute. In fact, I think she might be the most beautiful child in the world."

Brian nodded but rolled his eyes playfully. "Sounds like a serious case of parental bias. There's no doubt we're lucky, but let's please hold up on our appreciation until we've parked and are on the beach."

Emma threw the Speedo swim cap she was holding at Brian, who laughed and easily ducked away before pushing out into the front yard, letting the screen door bang behind him. The characteristic noise reminded Emma of the summers she'd spent as a child out on Long Island. Emma's father, Ryan O'Brien had done very well for himself and his family after starting a successful plumbing company in Inwood, Manhattan. Emma and Brian had both grown up among Inwood's sizable Irish community and had actually been aware of each other as grammar school-aged children while attending PS 98 even though he was two grades ahead of her.

For her part in preparation for the barbecue, Emma went into the kitchen, got out the cooler, and after putting in the cold packs from the freezer, filled it with the hamburger patties she'd made the previous day, the fresh de-grittled clams she and Brian had gotten earlier that morning at the harbor, a bottle of prosecco, and some fruit juice for Juliette. The unhusked summer corn was in a separate shopping bag as were the mille-feuille from the bakery.

A half hour later the family was in their Outback Subaru, heading east toward the Cape Cod National Seashore preserve. Juliette was buckled into her car seat next to the cooler, an inflatable boogie board, and three folded beach chairs. As per usual Juliette was holding on to Bunny while watching a cartoon on a screen built into Emma's headrest. At Juliette's feet were the rest of the beach toys, including pails, sand molds, shovels, and a pair of Kadima paddles.

After crossing Route 6, both Brian and Emma eyed the Wellfleet Police Department as it came into view. The building was a quaint, gabled-roofed white-clapboard structure with dormers that looked more like a country inn than a police department.

“I can’t help but wonder what it would be like being a police officer way out here in the middle of nowhere,” Emma observed. She turned to get a final glimpse of the picturesque building with a split log fence defining a visitor’s parking area. There was not a squad car in sight.

“It is hard to imagine,” Brian said with an agreeing nod. He’d had the very same thought simultaneous to Emma verbalizing it. This was a frequent occurrence, and they attributed it to how closely their lives had coincided. Not only had they grown up several blocks apart in the same borough of Manhattan and gone to the same grammar school, but they had both ended up majoring in Criminal Justice in college with Brian attending Adelphi on Long Island and Emma going to Fordham in the Bronx. Although they also had gone to different high schools, their transcripts were remarkably similar. Both had done well academically, and had been very active in athletics in high school and college. For Brian it was soccer, wrestling, and baseball and for Emma it was field hockey, basketball, and soft ball.

“Compared to our law enforcement experiences, it must be incredibly boring,” Emma said, as she faced around to look out the windshield. Both she and Brian had matriculated directly into the New York Police Department Academy after college, serving as patrol officers at very busy NYC Precincts. After five years of exemplary service, they had been accepted into the elite and prestigious NYPD Emergency Service Unit. It had been when Emma was a cadet at the ESU Academy that their remarkably parallel lives temporally aligned. Brian who was a

member of the ESU A team, volunteered on his days off to help the ESU Academy instructors. It was his way of staying up to date and in shape, and his reward was meeting one of the very few female ESU cadets, fall in love, and gain a wife.

“Especially off season,” Brian said. “To tell you the truth, I wouldn’t be able to do it. No way.”

They were now passing through mostly pitch pine and black oak forests. They also passed Gull Pond, which was north but near Long Pond where they had kayaked that morning. As it was their first trip to Cape Cod, Brian and Emma had been pleasantly surprised by the many freshwater ponds with crystal-clear water so close to the ocean on one side and the bay on the other. They’d asked a local about them and had been told it had something to do with glaciers back in the ice age.

Gross Hill Road dead ended into Newcomb Hollow Beach, and as they pulled into the parking lot, they were encouraged. A lot of bedraggled people were heading from the beach to their cars, carrying an enormous quantity of gear including beach chairs, sun umbrellas, and impressive coolers that made the Murphy’s Styrofoam model seem embarrassingly chintzy. Most were tanned regulars, but some were clearly burned visitors.

“Ouch,” Emma looking at one adolescent girl who appeared as pale as the Murphy’s. “She’s going to be sorry tonight.

“We’re in luck,” Brian exclaimed, pulling into a vacant slot remarkably close to the pathway that lead from the parking lot to the beach up over an impressive fifty-foot grass covered dune. As usual, Juliette was excited at the prospect of being on the beach, so she was first out of the car and impatient as Emma and Brian unloaded. Despite her agitation, she was

willing to accept carrying the bag of corn and most of her toys in addition to Bunny. While Emma carried the cooler and towels, Brian handled the grill, the briquettes, and the aluminum beach chairs.

It was late afternoon and the sun streaming over their shoulders painted the entire scene in a rich, golden glow. Everyone they passed leaving the beach was wearing their masks, as were the Murphy's. When they crested the dune, Emma and Brian paused to take in the dramatic sight of the wide, sandy beach and the large expanse of the Atlantic. The breeze was onshore, and it carried the sound of the two to three feet high waves as they broke. Since the tide was going out, there were numerous tide pools, which Juliette loved, since she was a bit intimidated by the ocean. Capping the impressive scene were large cumulus clouds that hung over the vista like dollops of whipped cream.

"Which way?" Juliette called over her shoulder.

"What do you think?" Brian asked Emma.

"I'd say north," Emma responded after glancing in both directions. "There's less people. And there's a good-sized tidal pool directly in front."

"To your left," Brian shouted to Juliette, who had already run down toward the water's edge.

They set up their camp about a hundred feet north of the path and up against the steep dune embankment. While Brian struggled with the grill, Emma put sunscreen on Juliette before handing the spray can to Brian. After tossing Bunny onto one of the towels, Juliette immediately bounded off for the tide pool.

“Don’t go in the waves until I’m down there with you,” Brian yelled to Juliette, and she waved back to signal that she had heard.

“When do you think we should eat?” Emma asked.

Brian shrugged. “It’s up to you. Just give me 15 to 20 minutes notice to get the briquettes fired up.” He poured them into the grill and closed the lid. “Meanwhile, let’s join Juliette.”

For the next forty-five minutes they ran in the wash from the surf, either chasing or being chased by Juliette. At one-point Brian managed to get Juliette to venture out into the breakers with him holding her hand, but he could tell she really didn’t like it, so they quickly went back to the tide pool. Shortly after, Brian could see that Emma was already back preparing the corn at their campsite, which was now in shadow. Taking the hint, he told Juliette it was time to start the barbecue and that he would race her with him running backward. Delighted at the prospect of beating her father, Juliette took off with a squeal and mostly thanks to Brian getting a late start, she gained a commanding lead.

“I’m afraid we have some unwelcome visitors,” Emma announced the moment Brian and Juliette came running back.

“What do you mean?” Brian asked. He glanced around, mostly skyward. On their previous visit to Newcomb Hollow beach they’d had a run-in with a few very persistent sea gulls and had been amazed at the birds’ boldness.

“No sea gulls,” Emma said, reading his mind. “Mosquitos.”

“Really?” Brian questioned. He was surprised, considering the significant onshore breeze.

“Yes, really,” Emma said. “Look!” She raised her left arm and pointed to the base of her deltoid muscle. Poised and obviously preparing to bite was a black mosquito with white markings, but before the insect could do its worst, Emma slapped it with an open palm. Pulling her hand away, the creature was reduced to a tiny bloody corpse, indicating it had already bitten someone else but still wasn’t satiated.

“I don’t think I’ve seen a mosquito like that,” Brian said. “Rather distinctive coloring.”

“I have,” Emma said. “It was an Asian Tiger Mosquito.”

“How the hell do you know about Asian Tiger Mosquitos?”

“During one of my ESU Academy medical lectures, we learned about Arboviral Disease and Climate Change. The lecturer specifically talked about Asian Tiger Mosquitos, which used to be restricted to the tropics, but now have spread widely northward all the way up to Maine.”

“I never got that lecture,” Brian complained.

“Times have changed old man,” Emma said with a laugh. “Remember, you were two years ahead of me.”

“What’s arboviral disease, anyway?”

“Remember reading about Yellow Fever and building the Panama Canal? Well, Yellow Fever is an Arboviral Disease.”

“Yikes,” Brian said. “Has there ever been Yellow Fever in the USA?”

“Not since 1905 in New Orleans, if I’m remembering correctly,” Emma said. She abruptly ran her fingers through her hair and then waved her hand above head. “Uh oh, I can hear more of the bastards. Aren’t they bothering you?”

“Not yet. Juliette, do you hear any mosquitos?”

Juliette didn't answer, but like her mother, she suddenly waved her hands around her head suggesting she was hearing them.

"Did you bring the bug spray?" Emma asked with urgency.

"It's in the car. I'll run and get it."

"Please," Emma said. "The sooner the better. Otherwise we are going to be miserable."

With no further urging, Brian grabbed his mask, jogged down the beach, and then went up over the dune. As he expected, he found the can of OFF in the glove compartment. When he got back to the beach less than ten minutes later, Juliette was again in the tidal pool.

"I tell you," Emma said as she began to apply the repellent, "these winged bastards were aggressive while you were gone. I had to send Juliette down to the water."

"I tried to be quick." He took the spray and applied it as Emma had done and then called Juliette back from the water's edge to protect her as well.

Once the Murphy's had the mosquitos at bay, they were able to get back to their barbecue. The corn cobs went on the grill first, followed by the hamburger patties, and finally the clams. By time the food was cooked and served, the entire beach was in the shadow of the dunes even though the ocean and the clouds were still in full sun.

After they had eaten their fill and partially cleaned up, Brian and Emma relaxed back into their respective beach chairs to finish the Prosecco, have their dessert, and to savor the view. The setting sun, which was out of sight behind them, was tinting the puffy clouds pink. Juliette had retreated back down to the edge of the tidal pool to make sandcastles in the damp sand.

For a while neither spoke. It was Emma who finally did. "I hate to break the spell," she said, turning to Brian, "but I've been thinking. Maybe we should consider heading back to New York a little early."

"Really? Why? We've got almost another week with the cottage." He was surprised by her suggestion since coming to Cape Cod for vacation had initially been her idea, and they all seemed to be enjoying it immensely. Even the weather was cooperating.

"I'm thinking that maybe if we were back home we could do something to possibly drum up some business."

"Do you have some new idea of how?" Brian asked. "What little work we had in the late spring totally dried up in July."

Eight months previously both Brian and Emma had left the NYPD to start their own personal protection security agency, which they appropriately called Personal Protection LLC. They had begun the firm with high hopes of success considering the level of their training and experience they had after being NYPD ESU officers, Brian for six years and Emma for four years, on top of each having been a regular police officer for five years. At the time of their retirement from the NYPD, both were sergeants and Brian had already passed the exam for lieutenant with flying colors. A consulting firm that they had hired at the end of the previous summer to advise them had projected rapid success and expansion for Personal Protection after supposedly taking all potential factors into account. Yet no one could have predicted the Covid-19 pandemic, which had reduced the demand for their services to almost nothing. In fact, during the last two months they'd had no work whatsoever.

“No, I haven’t had any sudden brainstorms,” Emma admitted. “But I’m starting to feel uneasy and guilty about us up here lazing around, enjoying ourselves not knowing what the hell the fall is going to bring. I know we needed a break after being cooped up all spring with the pandemic, especially Juliette, but we’ve had our fun. I’m ready to go back.”

“The fall is clearly not going to be pretty,” Brian said. “As soon as the United Nations Week got canceled, I knew all our projections went out the window. That week alone was going to put our company on the map.” With Brian and Emma’s professional connections with the NYPD, they had had hundreds of referrals, seeing as United Nations Week was an enormous strain on NYPD resources. Back in December they were concerned about having enough manpower to cover even half of the requests.

“Aren’t you worried about how we are going to weather this pandemic with all the talk about a fall surge?” Emma asked. “I mean, we’re already behind on our home mortgage payments.”

Both Brian and Emma had been thrifty and fiscally conservative even as children. When they started working for the NYPD, they’d saved more than their friends and colleagues, and also invested wisely. When they had married following Emma’s graduation from the ESU Academy and just before Juliette’s birth, they’d been able to splurge on one of the few freestanding, Tudor-revival, single-family homes in Inwood on West 217<sup>th</sup> Street. It was a mere block away from Emma’s parents’ home on Park Terrace West. The house was their only major asset besides the Subaru.

“A lot of people are behind on their mortgage payments,” Brian countered. “And we spoke with our loan officer. Plus, we do have some cash receivables. The mortgage is not going

to cause a problem. I think we've made the right choice to keep our cash to cover our other major business-related expenses, like Camila's salary."

Camila Perez was Personal Protection LLC's only employee. When the pandemic exploded in the New York area, she'd move in with the Murphy's and had been living with them ever since. It was one of the benefits of having a house with adequate living space. Over the course of the spring she'd become more like family than an employee. The Murphys had even encouraged her to come with them to Cape Cod, but she had responsibly declined in order to handle anything that came up in relation to the company. During the previous week, there had been a couple of inquiries about Personal Protection providing security for some high-end fall weddings in the Hamptons.

"You are obviously handling this all better than I am," Emma confessed. "I'm impressed that you're able to compartmentalize so well."

"Truthfully, I'm not doing that great. I'm worried too," Brian admitted. "But my worry comes mostly in the middle of the night when my mind can't shut down. Out here on the beach with the sun and surf, thankfully it all seems so far away."

"Do you mind if we continue talking about this now, while we're enjoying this glorious scene? Or do you want me to shut up?"

"Of course I don't mind," Brian said. "Talk as much as you want!"

"Well, what's bugging me at the moment is whether it was a good idea for both of us to leave the NYPD together," Emma said. "Maybe one of us should have remained on salary."

"In hindsight that might have been prudent," Brian agreed. "But that's not what we wanted. We both felt an entrepreneurial tug to do something creative and out-of-the-box. How

could we have decided who would have the fun challenge and who would have had to continue slogging with the same-old-same-old? Draw straws or flip a coin? Besides, I'm still confident it is all going to be just fine as soon as this damn coronavirus disaster works itself out. And we're certainly not alone. Millions are caught in this pandemic squeeze."

"I hope you are right," Emma said with sigh, before quickly slapping the side of her head. "Damn! Those mosquitos are back. Why aren't they biting you?"

"No clue." He reached behind Emma's chair for the can of OFF and handed it to her. "I guess I'm just not as sweet as you," he said with one of his typical mischievous smiles.