ERIC NOJI, M.D., MPH '87

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Mame Warren,
interviewer

Warren: This is Mame Warren. Today is the sixteenth of September, 1999. We're here with Hurricane Floyd and Eric Noji, and we'll see which one is the more exciting for the day. My guess is that Eric will be the more interesting event of the day.

Eric, you come very highly recommended as one of the more interesting people who's ever passed through the School of Public Health, but I want to know before that, I want to know what brought you there. What made you come to Hopkins in the first place?

Noji: I completed my residency training in emergency medicine at the University of Chicago in the early '80s, ended there in 1984. At that point, after one finishes one's residency training, you come to sort of a career branch choice. Should one pursue a private practice, what most people think of what medical doctors do? The other major category is pursuing a scholarly or academic medicine career.

I made that choice to pursue an academic career in medicine my senior year of residency in 1984, and, of course, that narrows down one's choice of institutions to work at. One would probably not choose to work in a small rural emergency room or a community hospital. Of

course, at that time, as is the case now, Johns Hopkins School of Medicine was preeminent, probably the top one or two medical schools in the country, along with Harvard.

So, having read and known about Johns Hopkins in the time I wanted to become a medical doctor in my teenage years, it wasn't a difficult choice to come to Baltimore and join the Department of Emergency Medicine. I should say Division of Emergency Medicine at that time, in the summer of 1984. We were a division of the Department of Surgery at the School of Medicine.

I had decided to come to Hopkins around February 1984, so I still had another six months of residency training to go in Chicago. During my senior year at the University of Chicago, we had one month of elective time, where we can do pretty much whatever we wanted to do in the field of emergency medicine, and I decided to do a rotation in what was called emergency medical services, popularly known as ambulance services, pre-hospital medicine in terms of emergency medicine terminology.

It was at that time that we had a couple of major large-scale transportation accidents in Chicago, a plane crash at O'Hare Airport and a major accident involving the Chicago "El," that is the subway metro system. During my rotation, I attended a lot of the after-action meetings to discuss how the medical system in Chicago could have responded to these two disasters in a more effective and efficient manner. With the airport disaster, unfortunately there were no survivors. There was a terrible crash of a DC-10, and I think over 250 people died.

But the upshot was, from these after-accident reports, that had there been survivors, it would have been a major disaster, because none of the hospitals around O'Hare had a disaster

plan. There was no communication or coordination between the Chicago ambulance service and the hospitals. The airport did not have a medical disaster plan.

As a result of that, one of my tasks during my rotation was to work with the city of Chicago and do some of the leg work behind developing airport medical disaster plan for O'Hare Airport that would provide good communication between the airport medical services, the ambulance services, and local hospitals.

Same thing with this train crash on the Chicago "El." Almost all the patients were taken right across the street to a nearby hospital, Michael Reese Hospital, totally overloading that hospital. My hospital was only about one mile away, and we received zero patients. Once again, this was an indication of poor disaster planning. The ambulance services on the South Side of Chicago had no disaster plan. Hospitals had no provisions for transferring patients from one hospital to another hospital, and as a result, the nearest hospital got totally overloaded when nearby hospitals, which were not very busy at the time, could have taken off the burden from Michael Reese Hospital and shared the patient-care burden.

At any rate, most of my rotation my senior year was spent on developing emergency medical planning, both for emergency rooms, hospital, and ambulance services for what we term a mass casualty event. This was fairly early in the days of emergency medicine, and it was in these early '80s days that there was growing interest in subspecialization in emergency medicine based on the most common problems one would see in the emergency room, like poisonings, drug overdoses, and, hence, toxicology over the subsequent years developed into a major subspecialty of emergency medicine.

Another area of interest in emergency medicine at that time, due to major transportation disasters like the ones I was involved with in Chicago, it was in the early '80s there was a major collapse of a skywalk at a Hyatt Hotel in Kansas City, killed about 113 people at a reception. This pointed out the woeful state of mass casualty planning by the specialty of emergency medicine.

So in the spring of 1984, when I was working on these disaster medical plans, this was at the time I was preparing to come to work at Johns Hopkins in the emergency department on the corner of Wolfe Street and Broadway, which was the location of the adult emergency services.

Johns Hopkins at that time was very much a traditional medical school with complete separation of an internal medicine side of the emergency department and a surgical side of the emergency department. In fact, at that time many of the older faculty referred to the emergency department as "the Ax," which is short for Accident Room, which now is a fairly antiquated term, but that was in use throughout much of the 1950s and early 1960s. At the time I arrived, younger physicians would refer to this place as the emergency room, which is another term which is not used that much anymore because of the development of the specialty of emergency medicine. The preferred term by emergency medicine specialists is "emergency department," and that's why these days you hear, even in small community hospitals, they tend to refer to the place where emergency goes as "emergency department," no longer "ER" or "emergency room," although we have–

Warren: No matter what the television says. [Laughter]

Noji: We have a very famous television show now called "ER," and that's in the popular press and in the public's mind. They probably still take their kids to what they term as the emergency room.

Hopkins, being such a huge place with strong specialty departments, not only had a surgical emergency room, an internal medicine emergency room, there's also a pediatrics emergency room and an ophthalmology emergency room, which is very unusual in any hospital, but Hopkins was fairly unique in that regard, in that one of the few places where if you had an eye injury or an eye emergency, there was a special emergency room for eye emergencies, and you'd be seen immediately by an ophthalmologist. Most community hospital emergency departments are manned by one physician, and if you have an eye emergency or a broken arm, that physician would have to call in the specialist from home at night to take care of that problem. Not the case at Johns Hopkins, where you have twenty-four-hour-a-day, seven-day-a-week coverage by both surgeons, internal medicine doctors, ophthalmologists, orthopedists, and whatnot.

At any rate, I started work at Johns Hopkins Hospital emergency department in July 1984 and had the introductory faculty appointment as an instructor in emergency medicine in what was called the Department of Surgical Sciences.

During that fall, I got more and more excited about being in an academic community. I enjoyed teaching. I enjoyed research. Emergency medicine was the newest of the twenty-three medical specialties at that time, and really it was frontier days. We were yet to develop a strong research base, a research tradition. At a place like Johns Hopkins, that was critical that one, in addition to being a good clinical doctor taking good care of patients, one also had to be a good

teacher. One also had to demonstrate a significant contribution in one's medical specialty toward advancing the field. Very difficult in emergency medicine, which had only been granted specialty status in 1980, four years before, whereas specialties like internal medicine and surgery had hundreds of years of tradition, a long history of medical research.

There was funding available from the U.S. Government through the National Institutes of Health to support young researchers in a variety of surgical and medical specialties, as well as ophthalmology, ear, nose, and throat surgery, but our disadvantage in emergency medicine was a very weak and new and young research base. We were just developing those parts of medical problems that would be amenable to research, like improving the medical management of poisonings, overdoses, trauma of a severely injured patient who had been in an automobile accident or gunshot.

Clearly, emergency medicine had a role to play in the field of toxicology. We're the interface of the hospital to a multitude of chemical exposures, industrial accidents. Being in East Baltimore, unfortunately, in an indigent area, we had a high patient load of cocaine and heroin overdoses, as well as the broad spectrum of medical problems attendant to alcohol abuse, so that was another growing subspecialty within emergency medicine which provided very important research opportunities for emergency physicians.

So I was both excited, as well as concerned, because how would I be able to continue a career at such a prestigious institution as Johns Hopkins Hospital, where to a great extent one's continuance as faculty, one's promotion, depended on not only good research, but good writing skills, publication of one's research in highly respected medical journals? So these were all in my

mind, and I remember very well I had a meeting with Dr. [David] Blake, at that time the associate dean of the School of Medicine for research, who was pretty blunt. He said that the criteria for promotion and longevity for faculty at a place like Johns Hopkins medical school was not only on the number of publications, they're not interested in–you could publish 1,000 publications, but if they were all of the same nature and were chapters in books and really did not advance the field, that would not be as worth much as one paper that changes one's field. And there were cases of specialists at Johns Hopkins Hospital in cardiology, neurology, orthopedic surgery, who changed their field by the invention of a new surgical technique, discovery of a new drug to cure disease, publication of a paper that fundamentally altered the practice of cardiology or neurology of whatnot, and the faculty member who published that one paper would be promoted on the basis of one publication. So that was a major lesson that Dr. Blake–that I remember to this day.

Another one was that a place like Johns Hopkins, with such a large, eminent faculty, that they weren't interested in a physician who was a jack of all trades, that was a generalist, that was good in a lot of fields. They are more interested in having the faculty member who was the world's expert in a very narrow area like, for example, surgery. I think someone like Dr. [John] Cameron was the world's expert in the Whipple Procedure. There were experts like Dr.–I'm blanking on his name–head of urology at that time, who was a master at a certain surgical procedure or procedures, experts in cardiology, in cardiac resuscitation now. There was a medical faculty person thirty years ago who developed the use of electrical defibrillation for shocking a person out of cardiac arrest. Some of the major cardiac medications for prevention of heart

attacks, control of high blood pressure. There might have been someone who was the world's expert in what we call calcium channel blockers.

So, in addition to the fact that I was told that a number of publications was not as important as quality of publications and whether that fundamentally changed one's specialty or field of endeavor. That was one lesson.

The other lesson was I needed to become an expert in a very narrow part of emergency medicine. As you can see, emergency medicine, by almost definition, is a very broad field. You are by yourself in the emergency department. You have to be able to handle the child with asthma, the patient coming in with diabetic ketoacidosis, the gunshot patient, the patient with the foreign object in their ear, the patient with heart attack, the patient with an eye infection, a patient with cocaine poisoning or heroin overdose. You have to know the right overdose antidote. So by its nature, because you have to see everything, little kids, gynecological problems with women, be able to deliver babies, gunshot wounds, internal medicine problems like out-of-control blood pressure or a patient choking because of their asthmatic crisis due to allergic exposure, my field was very general. Here I'm being told by the dean that, "If you want to survive here as a faculty for the rest of your career, you're will have to become the world's expert in a very narrow area."

Now, this was around November 1984. December 1984, in India, on December second–I'll never forget the day–I was watching the news, a major catastrophic disaster in India, Bhopal. Union Carbide had a big industrial plant in Bhopal which killed 10,000 people due to toxic exposure. So I'm looking at this, obviously a major medical emergency, a major disaster, a major humanitarian crisis, and just listening to the reports, I said, "Gee, had there been emergency

departments in Bhopal, India, at that time, the brunt of the medical management would have fallen on the shoulders of the Department of Emergency Medicine." So I'm thinking, gee, I did this rotation in ambulance services at the University of Chicago. Mass casualty management is in the province of emergency medicine. Toxicology–this was an industrial disaster, 10,000 deaths from poisoning due to methylisocynate, an intermediate chemical in the process of creating pesticides in India.

So it was interesting for three major reasons. It was a problem that would be seen my emergency docs. It was a problem that was toxicologic, a growing subspecialty of emergency medicine. And it was a disaster, which at that time was beginning to be felt to be a new subspecialty of emergency medicine. So I was very excited by that, because it combined my interest in emergency medicine, occupational medicine.

This was the most catastrophic industrial occupational health disaster of all time, showing a lot of the problems of growing industrialization in developing countries where legal citizen safety safeguards had not yet been developed. They did not have an OSHA. They did not have an EPA [Environmental Protection Agency]. Many American companies were moving their operations away from the United States to, tragically, escape stringent U.S. Government regulations governing the production of hazardous chemicals, both from a worker safety perspective, but also a citizen safety perspective of communities around factories. So these were moved to places like India, and the result is low, poor, and almost criminal oversight over the production of these chemicals, resulting in this Bhopal disaster.

So this was on December second. A week later, I heard that a Johns Hopkins faculty person became a member of an expert consultant team with the U.S. Centers for Disease Control, to actually go to Bhopal, analyze both the acute medical effects of this disaster as well as the potential chronic effects. At that time, at the School of Hygiene and Public Health, Dr. Gareth Green was chairman of that department and he was asked by the U.S. Government to join Dr. Jeffrey Kopelan, who currently is the new director of the Centers for Disease Control, Dr. Henry Falk, who subsequently was my first boss at the Centers for Disease Control, and Dr. Gareth Green, from the Johns Hopkins School of Public Health. They were special consultants to the government of India in December 1984.

And this was a major eye-opening experience for me, because it showed that there was a major role to be played by academicians like Dr. Green in a very practical response to disasters, providing advice on the appropriate medical management of chemically contaminated patients, providing advice to the Indian government, because most of the deaths were due to what we call pulmonary edema, a massive inflammation of the lungs due to inhalation of the methylisocynate. Dr. Green was a world-known expert in lung diseases, and he alerted the Indian government to the long-term sequelae of this disaster.

So that was another lesson for me, that in addition to the immediate medical effects of a disaster, in my mind I always thought of disaster as being over in a few hours, that once you've treated the patients in the emergency room after a tornado, due to their cuts and abrasions, or a hurricane, due to high-velocity projectiles, and getting overdoses, this really kind of changed

my–I'd never thought of, gee, here's a disaster which could have effects for fifty years, for the rest of a person's life.

Dr. Green, I remember, mentioned the possibility of not only these long-term effects on the lungs causing scarring, pulmonary fibrosis, that might have effects on these patients for the rest of their lives, and the possibility of birth defects from women exposed to this and affecting the next generation, and then possible genetic effects that may be affecting generations hundreds of years to come, as well as the possible carcinogenic effects, people developing a cancer that may not even be apparent for fifty years.

So here are in 1999. The Bhopal disaster was in 1984. Some of the survivors of the Bhopal disaster who are healthy now, maybe in ten, fifteen years may develop a cancer due to that chemical exposure as a result of what we call a sudden impact natural disaster.

So here I am as a very junior, young faculty person at Hopkins and we move into 1985. I have been very excited about the possibilities of making what we call disaster medicine a career focus, but unclear how to develop an expertise in this area. I could never gain credibility if I had never been to a disaster, no matter how much I had read. I had very heavy teaching responsibilities. I was responsible for the first-year medical school course in basic life support, CPR, first aid. I had been working clinically in the emergency department thirty to forty hours a week. What if there was a disaster? How could I leave to go to that disaster? I would have to find someone to cover for me in the emergency room. I would have to find someone to give my lectures to the medical students. That was something in the back of my mind.

Then we move into the summer of 1985. In September, major catastrophic earthquake in Mexico City killed about 10,000 people, and I began to collect a lot of the reports from some of the publications from the Mexico City earthquake. Most of the medical doctors who responded to this disaster were not emergency medicine specialists; they were specialists in public health, epidemiologists. There was concerns about water, sanitation, epidemics after the earthquake because of the damage to water systems, contamination of water systems, and the sewage. I read very little coming out from my own medical specialty, that is, of emergency medicine.

A month later, major volcanic eruption in Colombia, which dislodged a cascade of mud, lava, and ice from the tops of this mountain known as Nevado del Ruiz, that covered the town of Armero, killed about 24,000 people in October of 1995. There were briefings. I knew nothing about what was going on at the School of Public Health, but I almost accidentally heard that they were going to be having some briefings from some of the students at the School of Public Health who were from Latin America, some from the country of Colombia.

Dr. Mel Thorne, as a result of these disasters, started a course, very informal. It was not even in the Johns Hopkins school catalog, but just by word of mouth, forty, fifty students signed up to take this course, which I'm not even sure if they received academic credit for it at that time, but I sat in on as many as I could, getting away from my busy emergency department clinical schedule.

I sat in on Dr. Thorne's courses, and it was becoming more and more apparent to me–this is about just a year after I had arrived from Baltimore–that, gee, most of the expertise that I really need to acquire to become a disaster physician really isn't here at the School of Medicine, it seems

to be at the School of Public Health, environmental health, water, sanitation, tropical medicine, potential outbreaks of cholera, malaria in refugee camp settings. Many of the Johns Hopkins School of Public Health student body had experience working in refugee camp settings, in developing-country settings, in Africa, Latin America, Asia. And I really got excited by talking with these students who were very experienced in disasters taking place in developing countries, which I had had no experience up to that time.

So in December '85, I put in an application to the School of Public Health and was accepted, and the next year, 1986-87 academic year, was both my hardest year as well as my most fulfilling year, because I not only was a full-time student at the School of Public Health, and it was the School of Public Health which allowed one to get their degree in less than a year. Some School of Public Health, I think, like Yale and Emory, are actually two-year programs that require a thesis. That was not the case with a master of public health degree at Johns Hopkins School of Hygiene and Public Health.

So I really felt that the combination of emergency medicine, I was well versed in taking care of severe, acute emergencies. I was well familiar with the techniques of triage, which is a term that comes from military medicine, meaning "to sort." It comes from one of the physicians of Napoleon in Napoleon's wars, in that these ideas of prioritizing who is sickest, how can we deal with 100 patients at the same time, how do we make life-and-death decisions between a person who is so catastrophically injured that no matter what we do for that patient, that patient's going to die.

In a mass casualty incident, unfortunately, you have to leave that patient, make that patient as comfortable as possible, but move to the patient who is potentially salvageable. Major ethical issues there, but if one spends all one's resources on the sickest or more injured patient, five other potentially salvageable patients might die by the fact that we've taken all of our time and resources taking care of a patient who's going to die anyway. But that's more from military medicine slowly becoming incorporated into the specialty of emergency medicine.

So I felt perhaps if I want to make a career in disaster medicine, this blend of epidemiology, tropical medicine, environmental health might be a good blend with my training in emergency medicine.

Warren: Finish telling me, though, why that year was so difficult.

Noji: Okay.

Warren: You were a full-time student.

Noji: That year was very difficult because I not only was working full time in the emergency department, I was a full-time student.

Warren: But you weren't teaching at that point?

Noji: Not as much. I was no longer responsible for the first-year medical student course in first aid, but I was working virtually every single night shift, all weekends, because I had a minimum number of emergency shifts I had to fulfill to be on the medical school faculty. So my fellow faculty members loved me because I did all the unpopular midnight-to-eight shifts and the weekends, because I was in class during the days on Monday to Fridays. So that year I was very

popular with the emergency medicine faculty because I would work from midnight to eight and then take a shower and be in class at 8:30, and then having to be in class all day, do the homework early that evening, and be back and get a couple hours of sleep.

Warren: I hope so.

Noji: And be back in the emergency department at midnight. So from that perspective, it was hard. It was hard just professionally, personally, socially, because I worked virtually every single weekend from July to May, many, many night shifts, and then having also to perform academically during the day, and a very rigorous MPH course at Hopkins.

Warren: Let's talk about that. Let's talk about being a student of the School of Public Health. Take me through that program.

Noji: Okay. Well, let me just give another–just before I started my MPH program in April 1986–and I'll never forget it. I was in Gatwick Airport with my wife and heard of a nuclear powerplant disaster in Chernobyl, major catastrophe, one again one of these disasters that had acute effects. People died of heat, workers at the Chernobyl nuclear powerplant, but also deaths over the next several months from radiation sickness, and then with radiation disasters, genetic changes, potential for cancer, thyroid cancers developing twenty, thirty years later.

Once again, a Johns Hopkins School of Public Health faculty was a consultant to the U.S. Government in this disaster, Henry Wagner, chairman of radiation health sciences at the School of Public Health and also [unclear] radiology at the School of Medicine. He gave this major university-wide briefing on the Chernobyl disaster.

So as I start my training in public health in July of 1986, already I'm alerted to two possible mentors: Gareth Green, who worked with the Bhopal chemical disaster, and Henry Wagner, with the Chernobyl radiation disaster, major consultants providing practical applied medical and public health advice to the government of the Soviet Union, government of India, as well as a variety of U.S. Government agencies such as Department of Health and Human Services and the U.S. Agency for International Development.

June, I had to pick an advisor. Gee, what would be the closest to my field of emergency medicine? Well, at that time there was a major push in the public health community to get injuries to be considered a disease, because injuries were the number-one cause of death between the ages of two and forty-four. Automobile, road accidents, little kids getting into the medicine chest and getting poisoned by Tylenol or aspirin.

It was at that time that Johns Hopkins had a major pioneer. There was a woman who had worked for the previous fifteen years, in many cases against great resistance by the medical community, because the medical community said, "Gee, a disaster is cancer. A disaster is meningitis. A disease is heart attacks or strep throat. Accidents? That's not a disaster." And it was in the mid '80s that, through great personal courage, Professor Susan Baker, whose husband, Tim Baker, was a professor of international health at that time, she was a professor of health policy and management, who finally got the Johns Hopkins University to agree to establish a unit for what was called injury control, injury prevention.

Warren: Is she a medical doctor?

Noji: No. For one, she was a landmark, a person with a master's degree, no Ph.D., no M.D., and through sheer grit, and you can imagine in a traditional, conservative university, someone like that rising to full professor with tenure status at a place like Johns Hopkins University. At that time she was a full professor starting off from–she didn't even have an office in the late '60s, early '70s. Her office was at the Baltimore City Medical Examiner's office, like that–I can't remember the name of that TV show many years ago, of the coroner or the medical examiner. But that's where she got her support, was from the medical examiner's office for the city of Baltimore.

The insurance industry, they were very interested in reducing deaths from automobile accidents, improving the design of cars. So you had a push from the forensic medicine, pathology community, the insurance industry. Susan Baker published a landmark book called *The Injury Fact Book* in the late '70s, early '80s, which revolutionized public health. It was like that example, one publication which changes one's field.

Warren: Tell me about her as a person. Tell me about Susan Baker. Did you have her as a teacher?

Noji: Oh, yes. In fact, in June of '86, she agreed to be my advisor.

Warren: Then you can tell me all about her.

Noji: She took me on board. At that time, CDC had finally–that was another challenge. Working for CDC now, I know how hard work lobbying with Congress and to get CDC to consider injury as a disaster, they finally, in 1986 or '85, developed an extramural research program for injuries, and Johns Hopkins, under Sue Baker's tutelage, was able to secure funding from CDC to

establish a Center for Injury Prevention and Control. So that was just happening my first year as a student.

People like Ellen MacKenzie had done work on the public health aspect of ambulance services, what we call emergency medical services, to distinguish it from my specialty of emergency medicine. You had the formation about ten years earlier of the very famous Maryland Shock Trauma Center at the University of Maryland. So Baltimore was like a gold mine for a person interested in emergency medical services, ambulances, mass casualty incidents. You had R Adams Cowley at the University of Maryland in shock trauma. You had Ellen MacKenzie as a junior faculty at that time doing epidemiological research on victims of automobile accidents.

You had Sue Baker spearheading this new specialty of injury control. You had her getting funding from CDC to hire young faculty like our current–in fact, Gordon Smith, he came on board in February 1986. I remember that because I was looking for research collaborators and I could find no one interested at the School of Medicine, interested in disasters.

Gordon Smith had just finished his stint as an epidemic intelligence service officer, EIS officer, with CDC, and was gung-ho to apply the principles of injury control to reducing deaths from disasters. His boss was Susan Baker, and that's what drew me to Sue Baker as my advisor. She had probably two of the most popular courses in the evaluations of MPH students, and that was this new course called injury control. Gordon Smith, my academic year, started a new course in applying principles of epidemiology to preventing injuries. In my mind, and in most of the traditional epidemiology committee, they were used to applying epidemiology to control malaria, cholera, infectious diseases. There was even applying epidemiology to chronic diseases, was also

a new field at that time. The whole field of cancer epidemiology, applying epidemiology to reducing heart attack deaths, diabetes, that was also very much resisted by traditional epidemiologists who were used to epidemiology. That's why they call epidemics epidemics. Epidemiology–an epidemic is an epidemic of cholera or influenza, and they couldn't conceive of the possibility of outbreaks of–why are we having so many cases of thyroid cancer around this superfund chemical site? Why are we having so many deaths from all-terrain vehicles or motorcycle accidents?

Then Steve Teret joined the injury control faculty, bringing his legal aspects. Maybe we can use the results of injury control epidemiology research to change the legal system. The whole area of public health advocacy, advocating for citizen safety, advocating for the public health needed lawyers, because they're the ones who introduce laws.

So all these people were joining the injury prevention staff–Gordon Smith from CDC, Steven Teret, Sue Baker, Ellen MacKenzie–and that was very exciting new things happening. The academic year of '86–'87 was–okay.

Warren: We need to turn the tape over. I don't want to cut you off.

[Begin Tape 1, Side 2]

Warren: Okay, just go right on.

Noji: I know this sounds kind of weird, but even that–I can't remember whether it was the spring of '86 or the spring of '87, I was doing one of my shifts in the emergency room, we had a major mass casualty accident just outside of Baltimore, I think probably closest to Franklin Square Hospital, that an Amtrak train crashed. I don't whether you were living in Baltimore at that time,

but about two hundred, three hundred patients injured, several deaths. In fact, tragically, at that time, there was a professor of health policy management at Johns Hopkins, a full professor, who died, was killed in this train crash. He was in our department, health policy management.

As the emergency physician on call, I was responsible for the triage at the front entrance of the Johns Hopkins Adult Emergency Room, receiving casualties. Most of the patients went to Franklin Square Hospital, the severely traumatized adults went to Maryland Trauma Center, and the severely traumatized kids came to Johns Hopkins Hospital.

So once again, that was my first disaster that I was personally involved with and it was my MPH year, to top it off. The whole purpose I did my MPH was to get the skills to work as a career, as a professional, in disaster medicine. So that whole year was revolved around focusing my courses and getting as much experience in applying epidemiology to injuries.

Sue Baker, being my advisor, I took her course. I took the new course Gordon Smith offered. Ellen MacKenzie started a new course in the public health aspects of the emergency medical services, what is the role of the epidemiologist as a public health professional in reducing or improving the emergency health care systems. That was co-taught by Ellen MacKenzie in the School of Public Health and my boss, my immediate supervisor, at the School of Medicine, Dr. Keith Sivertson, who is the director of the adult emergency department.

It was a revelation to me, because I now began to think in terms of the emergency department. Having been a young physician just with a very narrow view of just the emergency department, and learning skills and managing heart attacks and gunshot patient and the overdose,

from now on I began to see the emergency department and its relationship with the rest of the hospital. We are the gatekeepers here.

This is a time of great decreased federal funding for indigent patients. Who took care of poor people? Emergency departments. Many private hospitals were transferring indigent patients to the county hospitals. You had emergency departments taking care of multi-trauma patients. The problems of the indigent areas, the poor indigent areas, were, in many cases, very expensive. Gunshot patients that would be in the hospital for months and months and months, permanent rehabilitation, permanent disabilities, patients with uncontrolled diabetes, heart attacks, and because they don't have their own doctors, their doctors were the emergency doctors, and they had no follow-up. They had no private physicians, and they just went to the ER when they got sick, due to lack of care, lack of control of these problems.

I began to think more in social terms, that the emergency department has a major social role, that we were the safety valve for the community, because private hospitals won't accept these patients. I really felt sorry for the private emergency physicians who would see these patients who had a hard time getting consultants to come in. The first question might be, "What's the patient's insurance status?" If they said this guy with a broken arm or whatnot didn't have insurance, the consultant would say shift them to Hopkins or the old hospital, which would take care of patients that don't pay.

So these are issues that I never thought about this in more social public health terms, but that was the things I learned from Ellen, was not only the major role of the emergency department and the financial aspects of health care, which I never thought of before, but in many cases we are

the major drain institutionally on the finances, because emergency department care is very expensive, twenty-four-hour care, nursing, physicians. In East Baltimore, unfortunately, most of our patients are Medicaid patients or no-insurance patients, and Hopkins just ate those expenses.

Warren: Well, that's something I'd really like to have you talk about, this neighborhood of East Baltimore. Let's face it, it isn't Roland Park. Tell me, describe the area around the hospital and what–I mean, you are describing its impact, but on a personal level.

Noji: At that time we're talking in the early 1980s, a lot of the urban renaissance was still in its early phases. At that time, the mayor was Donald Schaefer, and you had in the 1970s the renovation of the Pratt Street area, the Inner Harbor area, converting it from dilapidated abandoned homes, tenements, into a place that would try to attract tourists to come in. I think they were even offering at a time buying an abandoned row house for a dollar or five dollars, and then the person would have the option of renovating that house. That still had not really developed to the wonderful things which have happened there in the last ten years.

The area around Johns Hopkins Hospital was quite a change over the previous sixty, seventy years. I had read biographies of Osler and some of the faculty from the late 1890s and early 1900s and that area of Broadway, Monument, and whatnot were actually fairly fashionable areas in the early 1900s. Now it was a classic example of urban decay, all the attendant problems of the decay of cities in the 1950s, 1960s, poverty, crime, drug abuse, rat control was a major problem. The major front line of seeing these changes medically and socially was the Johns Hopkins Hospital, and the major part of the Johns Hopkins Hospital was the ax, the emergency department. We clearly saw all these problems of untreated chronic diseases, drug abuse, gunshot.

One of the great anomalies of American medical education was some of the very best medical schools in the United States were in some of the worst areas of town. The best places to go for training in my specialty, emergency medicine, was not at Cedars-Sinai in Beverly Hills or hospitals in Park Avenue in New York; these were the Bellevues, the Charities in Atlanta, Charities in New Orleans, the Gradys in Atlanta, L.A. County Hospital in Los Angeles, Cook County Hospital in Chicago, preeminent medical centers, Massachusetts General Hospital in Boston, and, of course, the Johns Hopkins Hospital.

From the perspective of research and medicine education, these are the places you want to train, because the emergency departments are manned by interns, residents in training, and they get to see cases at a medical school which might be located in an–I know this because I was an undergraduate at Stanford, and the medical school was in Palo Alto, a very affluent area. I remember because I had volunteered as an undergraduate to be an orderly in the Stanford emergency room and was essentially an admissions ward.

I remember Willie Mays and Shirley Temple came in, and the emergency department staff would just process them for next-day surgery or surgery in a few days. Certainly not an emergency room as we see on TV, which was the case–I mean, the John Hopkins emergency room was a very exciting place to work. It was a very tense place to work, where at any given time on a Friday night, Saturday night, drug deals gone wrong just a block away, gunshots, drug overdoses, lots of untreated asthma patients, people who don't get their insulin and come in with life-threatening diabetic ketoacidosis, classic myocardial infarction patients, because this person had no control of their blood pressure, had no personal physician to control their cholesterol. You

had a person with high cholesterol for ten years, coronary arteries get plugged, and the first time they see a doctor is with their heart attack. Whereas the middle-class white person would have had that identified by their private physician in Roland Park or Towson or Owings Mill and would never come to that position.

We would see those patients in the John Hopkins Hospital, and that's why Johns Hopkins School of Medicine is a much better medical school than the Stanford medical school. I hate to say that being an undergrad there, but because the medical students at Hopkins would see these types of patients, they would not see them at a more of a community hospital-based medical school.

So research, once again, if these are the patients that present with the type problems that the researchers–that's why Johns Hopkins is such a wonderful place to be a researcher and a student, because not only do you have Nobel Prize winners and cutting-edge research, you can actually see these diseases right downstairs in the Hopkins adult and pediatric emergency departments.

Johns Hopkins is a world-renowned medical school, so I remember sometimes in the Hopkins emergency room lobby you'd have a guy who's a drug pusher and then in the next seat would be someone who had just arrived at BWI [Baltimore-Washington International Airport] from Saudi Arabia, who just came to the emergency room, the guy might be a sheik and is coming from all the way on their private airplane to BWI and is being admitted there. So you also had an exclusive medical service as well as an indigent medical service.

I don't know of any place, maybe Boston and some of the Harvard medical institutions, but Johns Hopkins is a very unusual place where their medical wards had the poorest of the poor and a person who had been shot or had recovered from a drug overdose in East Baltimore, and then you'd also have a billionaire or the king of Iran. It's a very, very unique place to be a faculty person and a student. That's the type of institution Hopkins is, the best of both worlds, exposure to very difficult inner-city problems, but with a top-notch medical school there.

Warren: You've alluded several times, and I'd like to follow up on, just the excellence of your colleagues and your fellow students, I guess.

Noji: As you alluded, the best thing about Johns Hopkins School of Public Health, of course, the teaching was–Johns Hopkins School of Public Health has consistently been rated the number one school of public health in the United States. They draw–they've got, I think, the largest MPH class of any School of Public Health and an MPH class which draws students from all over the world.

Warren: Why is it the best?

Noji: I think it's because of both its excellent reputation of its faculty for research and commitment to teaching. Other universities have excellent teachers, but the teachers are more interested in research, because they perceive that the only way they can advance academically is by their research, and so teaching is done primarily by graduate students. That's not the case at the Johns Hopkins School of Public Health. Almost all my courses–all my courses were taught by tenure-track faculty, in most cases by full professors. Over time this attracts good students. These

students then go on and achieve stellar careers in both government or academia themselves, and that tends to attract a continuing generation after generation of excellence in students.

What's amazing is the Johns Hopkins alumni phone book is a great resource of people who have graduated from the School of Public Health who are now ministers of health, or even higher-level government, vice presidents of countries, major deans or presidents of their medical school or schools of public health in their countries. Then they inspire students in their countries, who are advised by these graduates of Hopkins to come to Johns Hopkins for schooling.

So in some cases, my fellow classmates over the years are now minister of health in Taiwan, or minister of health in India, or a high-level division director at the Pan-American Health Organization or the World Health Organization, or dean of the most prestigious university in their country. So my fellow students, because you interact with them on a daily basis, many of them had already achieved high-level positions in government, and meeting them subsequently when they went back and became minister of health, were great contacts for me professionally. Many of them had worked in disaster situations or refugee camps for some of the more famous medical what we call NGOs, nongovernmental organizations, like CARE, Save the Children, OXFAM, *Medicins Sans Frontières*, Doctors Without Borders.

I learn a lot just by interacting with them on a social basis. They go back, resume their positions with these major nongovernmental disaster organizations, and then subsequently were wonderful contacts for me when I wanted to develop my own career. "Hey, he was a classmate of mine." Or they go back to the U.S. Government and they see that the organizations that–and I wasn't thinking about this at the time, but, in retrospect, Hopkins graduates worked for the U.S.

Government's international humanitarian assistance programs, worked for FEMA, the Federal Emergency Management Agency, worked for the Centers For Disease Control, worked for the National Institutes of Health, or worked for the U.N. Humanitarian Office in New York. So these were wonderful contacts that helped me subsequently to develop my career, but clearly the fellow classmates in the MPH program, a large percentage, perhaps larger than any other School of Public Health, came from other countries.

So now here I am with an interest in disasters, and up until that time my whole interest was more in just big mass casualties. I thought I would leave my MPH program, go back to the School of Medicine and maybe develop an expertise in injury control or emergency health service evaluation and study ambulance services and how they take care of heart attack patients in the field, or how can we improve the management of road accident victims, or the design of emergency departments, or how can we improve our management of indigent patients in urban cities. But now I've gone through a year of MPH training, I'm hearing about all my fellow students with their work in Ethiopia and famine.

I remember in 1984, which was, at least to the American public, was the first time they really heard about these big famines in Africa. There was Live Aid. There were all these rock concerts. CNN had been developed in the early '80s, and they sent out their cameras to Ethiopia, and for the very first time the American public was seeing starving kids in Ethiopia, Somalia. I heard about it, gee, I'd never thought about disasters being due to climatic changes and drought and decreased agriculture production. There were now the beginnings of the end of the Cold War,

outbreak of all these civil conflicts in Africa, and refugees moving because of civil wars in Sudan, Ethiopia, Somalia. Gee, I never thought of war as a major disaster. I should have.

So I'm getting very inspired by these young nurses and physicians who would spend years not making any money at all, but providing experience–they're being exposed to diseases I had only read about as a first-year medical student, that had I gone back to work in Baltimore or in suburbia, I would never see cholera or ebola virus or dengue or yellow fever.

My fellow students were always describing how they took care of–under very primitive circumstances, with no EKG machines, no X-ray machines. I worked in the Johns Hopkins Hospital, the most highly technological hospital in the world. Boy, how do you take care of these patients with you're in a tent and you have no electricity, no running water? You may have no nurse. Maybe the person who is assisting you on surgery is a volunteer, a midwife, or someone with training as an ambulance driver. How do we take care of these patients in the field?

This was then reinforced by the Johns Hopkins faculty, which, to be honest, unlike some schools of public health, Johns Hopkins faculty, in addition to being eminent scholars and researchers and academicians, had years of working in the field in the '70s in Africa, in the smallpox eradication program of the '70s.

I met who was probably my biggest hero, Dr. Haroutune Armenian, who was deputy chairman of epidemiology at that time. Dr. Armenian had been at Johns Hopkins, got his MPH in 1972, and subsequently his MPH, then he returned to his home country of Lebanon. Then when he returned in the mid '70s, that's when the civil war broke out. Dr. Armenian worked, and ultimately became a full professor, under terrible circumstances in the Lebanese civil war. His

fellow students, his classmates, his friends from childhood are now fighting each other. Classmates who had been good friends before are shooting at each other.

He rose in that time to become dean of the American University of Beirut, which then actually became de facto ministry of health. His department was essentially–he was sending his students to do surveys across the green line and tracking down rumors of epidemics, and really it was a major experience for him, because he came out of that experience really recognizing epidemiology as more than just an esoteric academic classroom exercise, but really as a tool for public health, lifesaving measures, a tool for decision-making on an everyday basis by government officials. He wrote a classic book called–I think it was called *War, Children, and Public Health*, on how to maintain public health services at the city and national level in the midst of civil war, and how a School of Public Health can be a major community, a more activist role.

I won't name names, but in many schools of public health the faculty are in their ivory tower and almost look their noses down on community. Same thing with medical schools, what we call the town-gown dichotomy where there is antagonism between the community physician and the academician at the medical school, with the snobbery of the academician looking their noses down on the private practitioner. Of course, private practitioners say, "These guys don't know how to take care of real patients. Those of us working in the front lines in a community hospital, we're the ones who take care of the real community."

But Dr. Armenian, I remember, I'll never forget those lectures of how the School of Public Health at the American University of Beirut was proactive, very centrally providing everyday medical and public health services to the community. They are the ones who produced

the weekly epidemiology bulletins that would get fed back to the clinic doctors working right in the war zones, telling them of the list of diseases that had been seen because of contaminated water.

At any rate, Dr. Armenian returned to Johns Hopkins then after he was dean of the American University of Beirut under terrible conditions. I mean, I think he told me a story of looking out the window–he's someone you should talk with. He's an inspiring person. I think it was when the day the American Embassy in Beirut was bombed, 250 American Marines were killed. He's looking outside his window at it. I think his boss on American–this was a Rockefeller Foundation-funded university many years ago. That's why it's called the American University of Beirut. I think Dr. Armenian's boss was assassinated, American, very highly regarded academician. Professor Kerr.

So Harout has many–getting his own family out, his elderly parents, very sick, and with the total breakdown of the medical services. So he really brought in my awareness of disasters. Remember, in my mind, as a resident, a disaster is a train crash, the plane crash at Chicago "El." So during my MPH year, I'm now learning a disaster can be due to famine, a disaster can be due to political, social conflict, racial prejudice by one ethnic group preying on another ethnic group, causing them to move. Of course, when they move, they move into refugee camps with the attendant problems–water, sanitation, epidemics, vaccine-preventable diseases like cholera and shigella.

Dr. Armenian inspired us that the public health professional, even the academician, the professor, has a responsibility to the community to help the community that institute lives around.

I think Hopkins also is unique in that in the School of Public Health they also are very close relations with the indigent community around Johns Hopkins School of Public Health. I remember some lectures. They were trying to implement some STD [sexually transmitted disease] prevention programs or crime prevention programs, working with the local high school next to Johns Hopkins Hospital.

Professor Armenian described–not only was this a disaster which appealed to me, but it appealed to the fact that an academician can also have a practical applied everyday role in improving the lot of the citizens of a community, which, really, many professors don't have that. It is a problem, not so much at Johns Hopkins, of this ivory tower syndrome of becoming so focused on one's esoteric medical research that you almost lose sight of the fact that research is actually done to save a life or help a patient.

At any rate, that was one thing I got out of Hopkins, was the role of activist versus the social responsibility of the medical doctor and public health professional.

I took another course, it was in the area of time that Nobel Prize was awarded to Professor Chazov and Professor [Bernard] Lown at Harvard, Physicians for Social Responsibility, Physicians for the Prevention of Nuclear War. I took a seminar course on prevention of nuclear war and the role of the public health professional in preventing war. Gee, I'd never thought of that. That's a very broad view. Of course, nuclear war would be the ultimate disaster, and I had never thought of that as a disaster before. But when you think about it, it is, it's a catastrophic social disaster of all of humankind. That was a new course started at Hopkins.

Susan Baker, I took her injury course and continued my interest in transportation disasters. She hooked me up with the emergency planners at BWI Airport, and I worked as–part of my term paper was on how to improve ambulance and medical services at BWI, working with the local hospitals and with the emergency planners. So she had worked with them, mostly on injury, because she was developing this interest in airline safety.

In 1985, the year before, was the worst year on record for airline safety. There was this crash of the Delta 111 in Dallas due to wind shear factor. It was all over the news. Sue Baker was developing–she subsequently got her own pilot's license. So through her contacts with the aviation industry, that gave me contacts at BWI to discuss disaster planning, which was not Sue's major interest. Her major interest was like just improving everyday airline safety.

Gareth Green gave wonderful lectures on Bhopal, Henry Wagner on Chernobyl. There was a junior faculty at the School of Medicine who I'd heard about but never met, he had a joint faculty appointment at the School of Public Health in the Department of Mental–it had the words "mental hygiene" in it. His name is Professor Bruno Lima. Unfortunately, he died at a very young age due to cancer. The American Public Health Association has a memorial lecture every year called the Bruno Lima Mental–because it was a pioneering area of mental health as a major disease.

Mental health is a major public health problem, depression, anxiety, schizophrenia. Once again, I'd always thought about mental health as how do we treat the acute psychotic in the emergency room, and the suicide patient. I'd never thought as broad economic and social toll of time off from work. But Bruno inspired me, because he's trying to bring psychology and

appreciation of mental health and mental, emotional disease in developing countries where it's really not appreciated as a disease in many cases. The people with mental disease are shunned in some countries. There aren't any psychiatric hospitals. If you're crazy, you're put into a prison, as is the case in Pakistan. So he was trying to bring awareness of mental health problems and emotional health from developing countries.

But going back to that Columbia volcanic eruption, Bruno Lima did some of the first studies on the psychological and mental health consequences of disasters. So here's a fellow who opened up a whole new area to me. Gee, it's logical. He did work both on the emotional problems, posttraumatic stress of ambulance workers, search and rescue personnel who see terrible things, people in war who are providing services. First, I was aware of the mental health problems of the victims of the disaster, but here he's focusing in on providers. Health providers also have stress and strain, and they see terrible things in war, and they see babies being trapped in the rubble at an earthquake, or in the case of the volcanic eruption, these could last for decades, from posttraumatic stress.

So you can see here at Hopkins we have this wealth of faculty with personal experience in disasters, not only personal experience, but academic interest in disasters, like Gareth Green for chemical disasters; Harout Armenian for civil war, what we now call complex humanitarian disasters; Bruno Lima for the mental health consequences of disasters; Henry Wagner for radiation disasters; Susan Baker in aviation disasters.

Then I got to know Gordon Smith, the new faculty who started a course in injury epidemiology, and he had worked in several disasters as an EIS officer, I think. So I began to

become aware of the Centers For Disease Control being a major public health organization with a major mandate for disaster response, and that was through Gordon.

That same year I was alerted to a new faculty member who came from Cal Tech in engineering, Nicholas Jones, who is now a full professor. I can't believe it, when I came on he had just finished as a grad student at Cal Tech. We formed, that year, a multi-disciplinary research program studying earthquake injuries and how to prevent injuries from earthquakes. The unique thing about this was, and this was a new thing of collaboration between the School of Public Health, the School of Medicine, and the School of Engineering, the Whiting School of Engineering, because, really, to do a good job in studying injuries from earthquakes–because there's a saying that earthquake experts say, "Earthquakes don't kill people; buildings do." If you're standing in the middle of a cornfield in an earthquake, you may fall down, but no one's going to die from an earthquake. It's from poorly constructed designed buildings or poor occupant behavior when the building shakes. People take the wrong lifesaving action. It was from Gordon that I learned about the importance of behavior of people.

Nick Jones said, "Well, gee, you really need to work with the engineering community, because if you do your research, you've got to be sure you describe the buildings in a proper engineering architectural scientific perspective."

So that was a formative year. I actually introduced Gordon and Nick to each other, and I think that became probably the foundation of my next five years of academic work, which was pushing multi-disciplinary, multi-scientific expertise research to attack the problem of reducing deaths and injuries. You cannot do it from the perspective of just medicine, public health, or

engineering. You need to bring in the experts to work. That was a major challenge, because most faculty at Hopkins were only used to working in their narrow areas. I think this was very unique from all three of our perspectives, what was called crossing professional boundaries. I would say that that was one of my major things I took away from my Johns Hopkins experience, was the importance of crossing professional boundaries, which is a challenge.

I authored a paper with Nick and Gordon, but published it in an emergency medicine journal. Nick's promotion and tenure pathway may only appreciate publications in respected engineering journals. Gordon Smith's professional pathway may only appreciate publications in epidemiology journals. My field may only appreciate publications in surgical or emergency medicine journals, although now I've published many things in the engineering literature that deal with the relationship between a given engineering design, chemical content of the building from terms of is this a concrete building, a glass building, a steel reinforced building, adobe, wood. These became the foundations and a very fruitful research collaboration which essentially set the foundation for my pursuing a successful career in disasters by having good contacts in epidemiology through Gordon Smith and engineering contacts through Nick Jones.

Warren: Now, would you actually, during that period when you were crossing these boundaries, which is really exciting, would you actually come up to the Whiting School and talk to students there?

Noji: Yes, exactly.

Warren: Tell me about that. That's neat.

Noji: Nick, actually, was a very inspiring teacher and he actually had me to the Whiting School of Engineering giving lectures on medical consequences of building collapse. Because once again, most of the engineers are so focused on wind shear and relationships of the ground shaking and the mathematical physical properties, that they forget that the reason why they build safe buildings is not for the sake of just building safe buildings, but the ultimate goal is life saving, in saving lives.

When I showed them pictures of the search and rescue operations in Mexico City and in Armenia, and in San Francisco after the '89 earthquake, it really hammered down the fact that they also have a public role to fulfill in designing better earthquake-resistant buildings. Subsequently, some of Nick's Ph.D. graduate students devoted their theses to reducing injuries in earthquakes.

One of our public health students was spending so much time at the engineering school, Nick gave her an office, so Robin Wagner became the first epidemiology student with her own office at the Whiting School of Engineering, because her focus was on the relationship between earthquake, or I should say structural design factors from an engineering perspective, and its relationship to specific injuries and deaths, location of the building, what is the best thing to do, do you run outside when the building shakes, do you get under the table.

So that was my first contacts with Nick were actually during that academic year. Then after I graduated, Mel Thorne asked me to take over his course on public health issues and disasters. So I continued that and then getting continuous exposure during the remainder of my

time in Baltimore by three or four other generations of MPH students. I maintain all of my professional ties with Gordon and Nick.

In 1989, we put together some proposals for funding to the National Science Foundation. Interestingly enough, some engineering traditional federal research funding agencies, which were only used to funding engineering research, and here they are getting proposals from public health people. It was a challenge to convince them that, yes, this is worthwhile research, reducing injuries and deaths in earthquakes. We were successfully funded, we got a special research grant in '88 to actually support our travel to the site of the disaster where we can access money quickly. The only problem is, for example, NIH grants, from the time you send in an application to the time the money becomes available might be six months, maybe even a year.

So October 17, 1989, big earthquake in San Francisco, Nick and Gordon and I got on a plane the very next day. We were in San Francisco–

Warren: I've seen pictures of you out there.

Noji: That became the subject of a Johns Hopkins alumni magazine feature article. We were on site. We studied patterns of building collapse, location of survivors. It was important we were there, because within two days the bulldozers come in and they totally–all the search and rescue people, medical people, disperse all around the world, and so we call that perishable data. Once you're there to talk with these people, you gather that information. If you come back a week or a month later–in Turkey, I just got back from Turkey, within a week, almost all the buildings that had collapsed were bulldozed and all that valuable engineering epidemiology information is gone.

All the medical doctors had left the site. But it was exciting in the late '80s, because we were actually starting a new field of disaster research.

Warren: That's fascinating. See that red light? That means we're at the end of this tape.

[Begin Tape 2, Side 1]

Warren: This is Mame Warren. It's still the sixteenth of September, 1999, and I'm still here with Eric Noji. We're going to talk now about the really important faculty members or colleagues who made a difference to you. You've done a lot of that already, but I don't want to forget anybody.

Noji: I forgot, just talking about influential faculty members, of course Sue Baker, who was my advisor. I've described the important role she played particularly in providing an entry point into the public health field, with injuries becoming so prominent as a public health problem, and development of the Injury Prevention Center by Sue. That certainly was very important in the early days of my career, particularly in appreciating injury as a major disease.

Then, of course, when I started to get much more involved with injury research in earthquakes, all the courses I took from Sue Baker and subsequently Gordon Smith, both of whom are still on faculty here, have been critically technically. Sue Baker also, just personally in terms of the types of perseverance and mental toughness it takes, here's someone who rose to become an internationally recognized expert and a full professor at Johns Hopkins with a master's degree. That was a major accomplishment.

Haroutune Armenian, even after I finished my degree, Dr. Armenian, being Armenian, had many contacts in the Armenian American community. And then we go to December 1988 and the Armenian earthquake. This was probably the landmark event of my disaster career at Johns

Hopkins. I don't know if you remember the events, but it was on the day of the earthquake that President [Mikhail] Gorbachev happened to be in New York City meeting President [Ronald] Reagan, and for the first time, because of this catastrophic earthquake, Armenia being part of the Soviet Union at the time, President Gorbachev asked specifically for American government assistance. That initiated a massive flow of assistance to Armenia.

One thing good about being at Hopkins, we're geographically very close to Washington, D.C., where all of the U.S. Government's international relief organizations are. I had gotten to know many of them over the last few years, establishing contacts, giving lectures for them. Mel Thorne, who was another very inspiring teacher at Hopkins, put me in contact with the Pan American Health Organization. PAHO probably has the finest disaster management unit of any of the regional offices in the World Health Organization.

So since my MPH year with some of the students working for federal agencies, with the Hopkins faculty having such good professional ties with international U.N. organizations, World Health Organization, U.S. Government agencies, they would make calls on my behalf and opened a door for me with a lot of U.S. Government agencies.

But the bottom line is, when the Armenia earthquake happened, I got a call from the U.S. Office of Foreign Disaster Assistance, OFDA, to be the medical doctor on the American medical relief mission to Armenia, which was very exciting, because, remember, this is still the Soviet Union. It was in many respects, except for some upper-level professorial exchanges and student exchanges, very much a black box in the minds of the American community.

I go to the State Department one evening, and then we drive out to Dulles [Airport] and we get on a U.S. military aircraft and fly, stopping in–I think it was Gander, Newfoundland, and we refueled in Shannon, Ireland, and then in Belgrade, Yugoslavia, and then in Ankora, and then flew into Soviet air space. I was getting bored, so I went in the front cabin where the pilot was, and he had this map that said "We're now–" [Interruption]

So this was interesting, because I was looking at a map in the front compartment. It says, "Foreign planes crossing into Soviet air space are subject to being fired on." And here we are in an American military jet crossing Soviet air space. Now we don't think so much of that because there's so much communication with Russia, but at that time it was the Soviet Union and here we are, a military plane flying into Yerevan, Armenia. Bottom line is I spent time there and made a lot of contacts.

Got back to Baltimore, and Professor Armenian, being of Armenian descent, got very involved in the earthquake relief effort. He had major academic contacts with universities in Armenia, and we together established a–this is using all the information, things I learned from Gordon Smith and Nick [Nicholas] Jones–put together a protocol to study injuries from the Armenia earthquake. Those have subsequently been probably my most important publications, but having the input of Professor Armenian, both in terms of contacts, professional contacts, as well as the advice on developing the research studies, questionnaires, how to do research under very austere conditions. The earthquake occurred in the middle of winter. The teams we used were employees or students of the ministry of health, and they were under terrible conditions in

the earthquake area, about 40,000 deaths and about 700,000 homeless people. That occurred in December 1988.

So Dr. Armenian was quite an inspiration both in his work in wartime situations, as well as his assistance in doing this research in Armenia.

Warren: Let me ask you, two names that you mentioned, and I put stars by them because they seem to have been very important to you: Gareth Green and Henry Wagner. Are they both still at the School of Public Health?

Noji: Gareth Green left Johns Hopkins about five or six years ago to become dean of students at Harvard. Unfortunately, he died of cancer last year. But he was important in that he alerted me once again to the work of the CDC, because his colleagues that went to Bhopal were both from the CDC.

Henry Wagner I don't know well at all, but it was just an example of the strengths of the Hopkins faculty with experience in disasters.

I should say this one. I forgot one of the most important ones, Al Sommer, the current dean of the School of Public Health.

Warren: Tell me.

Noji: He published the very first article, with [W.] Henry Mosley, who is professor of population dynamics at Hopkins. But in 1970 there was a catastrophic cyclone that inundated the shore of at that time East Pakistan, before the civil war, and killed–I mean it was 250,000 and 500,000 people drowned.

At that time in Dhaka there was what's called the diarrheal research center that was funded by the U.S. Government and manned by both CDC doctors and Johns Hopkins. Henry Mosley, who had–I think he was a former CDC doc–at the time he was a junior faculty at Hopkins, and an EIS officer, epidemic intelligence service officer from CDC named Al Sommer, and although they were there to do diarrhea research when the disaster happened, they shifted gears and conducted a lot of the damage assessment island by island, village by village, using epidemiologic and statistical techniques which previous had only been used in determining vaccination coverage in the smallpox eradication program.

So it was a very unique and very innovative use of epidemiology and statistics that had never been used in a disaster before, but now been used in direct decision-making and allowed them to pick, in a random fashion, in a statistically sound fashion, so that by going to a few islands and villages, they can then generalize to the entire cyclone area. The results of their survey were published in a very prestigious medical journal, *The Lancet.*

This was, to my knowledge, one of the very first instances of the use of epidemiology as a decision-making tool in disasters, and two current Hopkins professors were the authors of that, Al Sommer–it's funny, at the time I think he was trying to decide whether to become an epidemiologist or an eye surgeon. He opted for eye surgery, and so for the next twenty–he was out of public health. I mean, he was learning how to be an eye surgeon. He got back into public health when he learned that Vitamin A deficiency was a major problem of blindness in the developing world. And it was because of his interest in Vitamin A–and this was a major public health problem, Vitamin A deficiency in young kids, how to fortify their food better–and so he

gradually moved away from the technical aspects of retinal and eye surgery back into public health, although related to eye problems. For many years he was a professor of surgery at the hospital.

Then he moved back into public health and is now the dean of the School of Public Health, but many, many, many, many years ago his first idea of a career was to become an epidemiologist and he published, with Henry Mosley, a classic paper that changed the whole field of disaster medicine.

Warren: Fascinating.

Noji: So when I started this course in disasters at Hygiene, one of the people I had as a guest lecturer was Dr. Sommer. At that time I didn't think of him at all as a public health person, but because I had this classic paper, I knew his office was right across the street in Johns Hopkins Hospital, and he was gracious enough to come over and give a lecture at the School of Public Health. I was kind of concerned, because I thought of him as very much a hands-on doctor. I said, "You probably won't have much–" I was worried about what he was going to say to the students, but it was great. And lo and behold, a couple of years later he replaces D.A. Henderson [laughter] as the head of the School of Public Health.

Warren: So that was the next name I was going to ask you. How about D.A. Henderson? Did you have any relationship with him?

Noji: I knew him for many years since I was small, because he went to the same medical school as my uncle [Donald Hayashi]. My uncle's last name was Hayashi. The way they assigned people as like laboratory partners in cadaver dissection was alphabetically, so my uncle knew D.A.

Henderson at the University of Rochester in 1954, so I'd heard of his name. I'd heard of him because he was the head of the EIS program at CDC, Atlanta, and then he became head of CDC smallpox program. Then he became head of the World Health Organization's smallpox program in Geneva before moving to Baltimore in the mid '70s.

But I met him because in this period I began to think that Hopkins has such major strengths as an institution in emergencies and disasters, not only at the School of Public Health, but we have a very strong emergency medicine department, we have an engineering department with Nick Jones, with a very strong interest in applying engineering principles to lifesaving activities and disasters.

Another fellow, Professor [Charles] Revelle, professor of geographical engineering, who had done some things many years before on how can we optimally design locations of critical facilities like hospitals, fire stations, ambulance services. So that also had important ramifications for disasters, was proper siting of critical facilities that might have importance in the post-disaster phase, like locations of hospitals, ambulance services.

This was the beginning of interest in geographical information systems, and I was very interested in the use of GIS as a tool for disaster planning. There was major expertise there in water, sanitation and water systems, with the famous Professor Abel Wolman, who is now deceased, but he was at the Whiting School of Engineering. He had close ties with the School of Public Health because of the relationship between water, sanitation and disease.

Warren: Did you work with Abel Wolman?

Noji: No, I didn't, but all this came together and we said, "Gee, why don't we try to capitalize on our comparative advantage as an institution by establishing a disaster training and research institution at Hopkins?" So I hammered out this proposal in like '89 and '90, and I presented it to the School of Medicine dean, who was very interested, at that time Professor [Richard] Ross. I presented it to D.A. Henderson, who was very, very interested. Then we got someone from Homewood campus, at that time a vice president, Mr.–Ross.

Warren: Ross Jones?

Noji: Ross Jones, yes. I don't know if he's still here. But Ross Jones–

Warren: He hired me.

Noji: Oh, he did? Well, he became the coordinating focal point to establish a disaster research center at Johns Hopkins in all–it became very exciting because we were going to draw in not only the medical school for its medical expertise, the School of Public Health for all the people I mentioned to you, the Whiting School of Engineering. There was a new–it was called urban studies, because they were interested in big disasters at major urban centers. Johns Hopkins had established this urban studies center. We were going to draw them.

Applied Physics Laboratory at–I don't know, someplace near Columbia, Maryland, because they were interested in developing equipment for improved building collapse search and rescue, and they had just millions, maybe a billion dollars from the U.S. Navy to develop these. We had people like Gordon Smith, Sue Baker, and Bruno Lima, Haroutune Armenian, Henry Wagner, Gareth Green, Nick Jones, B_____ from the Applied Physics Laboratory.

Then I gave a lecture in June '89 at the fourth National Environmental Health Conference to present the results of my research on the Armenian earthquake. It happened at that time that one of the persons in the audience was Dr. Vernon Houk, who was director of the National Center of Environmental Health at CDC, and he said, "Why don't you come down to CDC and work for me?"

I said, "No, I'm very happy here at Johns Hopkins."

Then subsequently the Loma Prieta earthquake hit in October. CDC started to do a lot of research on the Loma Prieta earthquake. CDC called me again in November of '89 to come down to establish a program in natural disaster epidemiology, and the person who called me was Henry Falk, who had gone down to Bhopal with Gareth Green in 1984. Henry Falk was the director of the Division of Environmental Hazards and Health Effects.

It was interesting. Of the very close relationships between CDC and Johns Hopkins, many of the senior-level staff at CDC had gotten their MPHs at Hopkins. Conversely, many of the Johns Hopkins department chairmen and people had been EIS officers at CDC, from like Al Sommer, D.A. Henderson, Henry Mosley, Gordon Smith, Bob Black, the chairman of international health, Neil Halsey. Henry Mosley. All former CDC medical doctors. So there are many Hopkins people at CDC. So historically there's been this very close tie. D.A. Henderson, head of the CDC EIS program, head of the CDC smallpox eradication program, dean at the Johns Hopkins School of Hygiene and Public Health.

Then thanks to a lot of Hopkins contacts with federal government agencies, I knew all the people at FEMA [Federal Emergency Management Agency], U.S. Agency for International

Development's disaster programs, CDC. In the spring of 1990, I accepted the position to develop a program in disaster epidemiology research at CDC, so I reluctantly left Baltimore in July 1990.

Warren: Did that plan ever come through? Did anything come of it?

Noji: No. All this was happening in the spring of 1990, and so I left as a lot of these plans to develop this multi-disciplinary multi-department, multi-institution disaster humanitarian assistance program at Hopkins, and I had developed a proposal about this big, which we were then going to submit to foundations and the U.S. Government. That kind of laid fallow for about four years, till about 1993–'94, and then Hopkins hired another professor, a Gil Burnham, whose expertise was more in refugee emergencies, and he dusted off this proposal and they modified it more to focus in on what are termed "humanitarian crises."

This new term came of vogue in the '90s, called "complex humanitarian emergencies," referring to emergencies whose genesis or origin was more in political, economic, social, or civil conflict reasons, causing social breakdown with resultant health effects like population movements, like one ethnic group persecuting another ethnic group, causing them to migrate, as we saw in the summer of '94 with the million refugees from Rwanda going to Zaire. That's Gil Burnham's major area of expertise, not natural disasters.

Then he, great perseverance, dusted off this proposal and now there's this new program for disaster and refugee health studies based primarily at the School of Public Health, that Gil Burnham is chief of. He's been successful getting funded from U.S. Agency for International Development, but its focus is on more what we call human-generated emergencies and not natural disasters.

Warren: I don't know whether you're listening outside, but I'm beginning to think we're getting a natural disaster. We'd better start paying attention to it.

Eric, I feel like I have wonderful material here. Is there anything that we should say at the end here that we haven't talked about?

Noji: Well, I guess how things go full circle. For five years then, based on my foundations at Hopkins, research contacts, I developed a program in disaster epidemiology research, and we investigated and published over 100 papers, not just on earthquakes, but major papers on Hurricane Andrew, Hurricane Iniki in Hawaii, the volcanic eruptions, major flooding. Remember the great Midwest flood of '93?

Warren: I was in it, yes.

Noji: Fourteen states were under water. Chemical disasters. another Union Carbide disaster in West Virginia, Institute, West Virginia. Terrorist disasters. We did a study of the injuries in the World Trade Center bombing, Oklahoma City bombing, saran chemical weapon attack in the subways in Tokyo.

Early '95, I switched gears and I left to become chief of CDC's international refugee health program, where my focus was no longer natural disasters, but refugees, the war-affected populations. We worked in Bosnia, the war in Somalia, Liberia, Sierra Leone, civil war conflicts. So it's been interesting that at CDC I've now had a wealth of experience in natural disasters, industrial emergencies like factory disasters, terrorist disasters, and now war, civil conflict, and refugees.

Then two years ago, in '97, CDC has this longstanding relationship with the World Health Organization in Geneva, and we've got about–I think twenty staff assigned worldwide to a variety of WHO programs. Like the big program now is polio eradication, very similar to the D.A. Henderson–D.A. Henderson's secretary at WHO is still in our building, from back in the '60s and '70s.

But I've been secunded by the CDC for the last two years to WHO, to work in developing an emergency epidemiology program and improve the medical and epidemiological response to refugee emergencies, and now I may be moving over to work more on specific infectious diseases, what we call special pathogens, reemerging disease, like Ebola virus, antibiotic resistant tuberculosis, malaria, and agents of bioterrorism. This is a very hot topic right now and a major concern.

That's what brings me full circle around, is that what is D.A. Henderson's big interest now? Bioterrorism has a new center on bioterrorism activities.

Warren: Is that what's brought you here this time?

Noji: No, no, no. [Laughter]

Warren: I'm going to be talking to him about that and learning what he's up to these days, as well as what he did a long time ago. Not that long ago. I'm really looking forward to spending some time with him.

Eric, this has been pure gold. I can't thank you enough.

Noji: I'm glad. I know you want to focus what you write on very narrow areas. This has been very broad–the hospital, medical school, School of Public Health, engineering. [Laughter]

Warren: I can't tell you how thrilled I was when you started talking about that, because that, to me, is what my book is all about, is what makes Hopkins Hopkins. It's that kind of broad ability to reach out among the various divisions.

Noji: Exactly.

Warren: So I'm going to send a dozen roses to Ricky Fine. Thank you.

[End of interview]