**William Haseltine Interview with Wahid Doss**
**The 100 Million Healthy Lives Program**
**Cairo, Egypt March 28, 2019**

**William Haseltine (WH):** Thank you for taking the time to meet. I would like to discuss the topic at hand, The One Hundred Million Healthy Lives Program. Let me begin by asking, what is your clinical background?

**Dr. Wahid Doss (WD):** I graduated from Cairo University in 1977 and began my residency in 1979. I completed my master's degree, that here is the equivalent of a PhD, then I became a lecturer at the University of Cairo. I became an associate professor in my department. My career shifted in 2006 when I was selected to be Dean of the National Liver Institute in Cairo and the head of the National Committee for Control of Viral Hepatitis under the Ministry of Health. I kept my post at the university but had extra duties in the Ministry of Health.
At that time, in 2006 the Minister of Health was a friend of mine. Egypt had a terrible problem with hepatitis C. Some people believed that up to half of the population, about fifty percent of all Egyptians were infected with hepatitis C. The Minister of Health stated that is not true. There were no good data at the time. There were conflicting views of the actual prevalence of hepatitis C in Egypt. The minister decided to do something about it. That is why he created the National Committee for Control of Viral Hepatitis.

**WH:** In what year did he create the National Committee for Control of Viral Hepatitis created?

**WD:** In 2006. The Committee had very specific goals. One goal was to estimate the real prevalence of hepatitis C and B in Egypt. The second goal was to establish a treatment program. The third goal was to establish a prevention program for both Hepatitis B and C. The fourth goal was to conduct applied research on how best to control and treat hepatitis infections. The fifth goal was to create new centers in Egypt for liver transplantation and for the management of patients with end stage liver disease. We initiated the first study of hepatitis prevalence in 2008. In 2015, we conducted a second survey through what is called the Demographic and Health Survey of Egypt, in partnership with the United States Agency for International Development, the World Health Organization and several other organizations.

**WH:** Who funded the second survey?

**WD:** USAID.

**WH:** What was the total amount of support?

**WD:** The survey was not restricted to studying the prevalence of hepatitis C. It was for global health. The details of the study are available on the internet as DHS Egypt 2008 and DHS Egypt 2015. In 2008, we did a survey of Egyptians over the age of eighteen. We surveyed twenty seven government districts. We found that the prevalence of Egyptians with hepatitis C antibody in the 2008 was 14.9 percent. Almost 15 percent of adults over the age of eighteen tested antibody positive for hepatitis C. We also found that we could detect hepatitis C RNA (evidence of active virus replication also called viremia) in the blood of about ten percent of Egyptian adults. We initiated a treatment program for were viremia. At that time, in 2006, the only way of treatment was interferon.

**WH:** Interferon in combination with ribavirin?

**WD:** That is correct. We treated those who tested positive for virus in the blood with a combination of interferon and ribavirin. At that time, the cost of treatment per patient in the private market was seventy thousand Egyptian pounds (about four thousand US dollars) per patient with a cure rate of 40 percent. The treatment itself induced many side effects. Many suffered from other health conditions that prevented the use of combination therapy.
I became an expert in how to reduce the price of medications. At that time, the two companies producing interferon were Roche and Merck Sharp & Dohme. I convinced the companies to give us interferon at about a third of the normal price. Part of the negotiation was to assure the companies that we would create specialized centers for the treatment of hepatitis C and conduct treatments only at such sites. That way, we control the distribution of the drug. The patients took the treatment on site. The pharmaceutical companies were concerned that our low cost interferon might leak into other markets.

We created a network of specialized hepatitis C treatment centers all over the country. We treated patients with weekly injection. All patients treated with the low cost interferon in Egypt were treated at our centers. This is how we convinced the companies that their drug would not enter other markets.

**WH:** How many specialized hepatitis C treatment centers did you establish?

**WD:** By 2013 we had twenty five centers, in Cairo, Luxor, Aswan and many other populated areas. We treated around fifty thousand patients a year. The government paid for the entire treatment. As I mentioned, there are many contraindications and intolerable side effects to the ribavirin and interferon treatment that limited the number of patients we could effectively treat. In total,

we treated about four hundred thousand people between 2006 and 2018. We realized the treatment was not ideal. It was the best we could do at the time.

I am a member of the American Society of Gastroenterology. I attend their annual meeting every year. I knew that new treatments were in the works, the so called directly acting antivirals. They are called directly acting antivirals because interferon does not act directly on the virus. Interferon acts by promoting the immune system to fight the virus. The directly active antivirals prevent virus replicating by inhibiting a viral enzyme essential for viral growth. The first such drug sovaldi, was approved in the United States in 2013. Even before approval we began testing sovaldi in Egypt in early 2013.

**WH:** With Gilead?

**WD:** Yes, with Gilead. We published the results in *Hepatology*. We started giving sovaldi in conjunction with ribavirin. It was a very nice study. We had very good results. We expected to have solvaldi here in Egypt. The shock came around December 2013 when Sovaldi was approved and the price per treatment was eighty seven thousand per patient!

**WH:** We were all shocked.

**WD**: It was a big shock. We asked ourselves what should we do? How can we afford to treat Egyptians with this highly effective new drug? Then Gilead, the company that sold the first approved direct acting antiviral contacted me. Representatives of the company came to my office. At the time, I was Dean of National Liver Institute. The chief executive officer Greg Alton came with a big team.

Egypt was first country outside the US, Gilead visited. Why Egypt? Because of the very high prevalence of hepatitis C infection and the fact that Egyptian government had made a commitment to treatment. Perhaps, even more importantly from their point of view, we previously established liver treatment centers that had the capacity to control use of the drug. All of the treatment centers were and are connected in a single information network. Data from patients treated in Aswan for example are simultaneously uploaded to our control center in Cairo.

**WH:** Does that mean you created a unified information system for all your centers?

**WD:** Exactly. These centers have a very strong system to prevent use of the drugs outside the system. We were able to convince Gilead that if they gave us a

very good price for their drug we would purchase it in substantial volumes and assure them that their lower price drugs would not end up in higher priced markets. At that time Gilead divided the world into three categories depending on the gross domestic product, high, medium and low. Gilead planned to sell a full treatment dose of the drug in high income countries for eighty seven thousand dollars, for middle income countries at six thousand dollars, for low income for nine hundred dollars. Egypt was classified as a middle income country meaning they would offer us a treatment dose for six thousand dollars. That price was well beyond our capacity to pay.

I convinced the President of Gilead that we might be able to pay the lower price. John Martin, the CEO later came and offered Egypt the price of the lower countries, nine hundred dollars for treatment or about 1 percent of the price in the United States. They had certain conditions. The box of pills must be opened and the first tablet must be taken in front of the doctors in our centers. I said, okay, no problem. We drafted a memorandum of understanding which was approved by the Prime Minister. We signed the memorandum in the Prime Minister's office in July 2014. We obtained permission to use the drug in Egypt in the record time of three months. At the time, I was a member of the National Drug Approval Council. I convinced the members we need this drug.

We approved solvadi in July despite some opposition. We introduced our program at a special meeting of Liver Institute where we developed national consensus guidelines. Our first treatment was administered in September 2014. Millions of people were waiting to be treated. By that time, we had already established twenty or thirty treatment centers.

**WH:** How did the price compare to the combined price of the interferon and ribavirin?

**WD:** Treatment with solvadi was cheaper. Each patient cost us cost two thousand Egyptian pounds. At that time, the dollar was equivalent to seven pounds. So, two thousand Egyptian pounds a month, six thousand pounds for three months, compared to twenty four thousand for the interferon.

How might people apply for the treatment? We decided the best thing would be to accept applications over the internet. We built a fantastic website. All that you needed to do to apply was to enter your name, your national identification number, and your mother's maiden name. Why your mother’s maiden name? Nobody but the applicant should know the mother’s maiden name.

The next day the candidate would visit a treatment center to make an appointment. They received the location and time of the treatment appointment

over the internet. The center examines the patient and administers the treatment at the government's expense. The first night, we opened at midnight on September 14. One hundred thousand people applied for treatment within the very first minute!
**WH:** Did you advertise?

**WD:** Of course. The press also carried many stories about the program.

**WH:** Am I correct that the treatment was free?

**WD:** Not free, but free to the patient. The government paid for it. Patients did not pay anything at all. People swarmed our liver centers. Everyone wanted treatment. The Liver Institute in Cairo had a thousand new patients every day. We treated close to three or four hundred thousand patients in 2014.

Other direct acting antiviral drugs followed in quick succession.
After sovaldi came simeprevir, then daclatasvir and ledipasvir. We set the benchmark with solvadi. We wouldn't accept a new drug into our treatment program if the company that made the drug did not give us a price comparable to solvadi. We began treating patients with sovaldi in combination with olysio, followed by sovaldi with ledipasvir and Sovaldi with daclatasvir.

**WH:** Does Egypt recognize patents on these drugs?

**WD**: That became a very important issue. The initial draft of the memorandum of understanding with Gilead included a clause that stated that we must agree to recognize their patents. I replied that we are not the body which provides or denies patentability of a drug. A government body must do that.
In the end, the government of Egypt decided not to grant patents to direct acting antivirals for hepatitis C for several reasons. Apparently sofosbuvir is an old molecule with some side effects. The government of Egypt also argued that hepatitis C is an endemic disease which under the Trade-Related Aspects of Intellectual Property Rights agreement meant that treatments could be exempt from patient protection.

Consequently, Egyptian companies were allowed to produce generic versions of the drugs. At the time, I was a sitting member of the Higher Council of Drug Approval. In Egypt, it takes about four or five years for a new drug to be approved. I passed a resolution enabling fast track approval of all new international and local generic direct acting antivirals. We required the manufactures to provide proof of potency. In record time twenty different Egyptian companies began producing local generic direct acting antiviral drugs.

**WH:** Twenty?

**WD:** Yes. Now twenty Egyptian companies are producing the drugs.

**WH:** Are all of these the same?

**WD:** No, no, no. We have sovaldi, daclatasvir, and harvoni. Seven different direct acting antivirals in all.

**WH:** Does each company produce more than one?

**WD:** Each company may produce one or two.

**WH:** Do I understand it correctly, the way you were able to reduce the price even further was to deny the patentability of the entire class of drugs?

**WD:** Yes, but I did not deny the patents. The government did.

**WH:** If I understand the situation correctly all of the direct acting antivirals were denied patent protection in Egypt not because they were not novel structures but because they were granted exemptions under provisions of the TRIPS agreement?

**WD:** Yes. Egypt would not have been able to pay the negotiated Gilead price for millions of our citizens. Once the patentability of the drugs in Egypt was denied, the minister opened a production of the drugs to all the Egyptian pharmaceutical companies. Competition amongst these companies is another way to reduce the price.

**WH:** Do the Egyptian companies produce the active ingredients, the so called APIs, as well as the formulated pills?

**WD:** No. All the APIs are produced in India and formulated here in Egypt.

**WH:** By what company in India?

**WD:** There are many API manufactures of the direct acting antiviral drugs in India.

**WH:** Is Cipla one of them?

**WD:** Yes, Cipla is one. We do not produce APIs in Egypt. They all come from India. One step of the API manufacturing is done in China. The initial prodrug is

made in India, modified in China, and returned to India where the process is completed. We have an abundant supply of direct acting antiviral drugs at a low price. The price for a complete treatment dose is now eight hundred Egyptian pounds, about forty to forty five US dollars. Our standard treatment is with a combination of sovaldi with daclatasvir. We call it Sof/Dac.

**WH:** Why do you use two?

**WD:** That is the protocol.

**WH:** Do you know that it is more effective with two than with one drug?

**WD:** Of course. No, you cannot give solvadi alone. We must use two. That is the standard all over the world.

**WH:** How effective is the treatment?

**WD:** The cure rate is between ninety six to ninety eight percent. That is fantastic!

**WH:** How many treatment centers exist today?

**WD:** Now we have a hundred twenty five centers. All the treatment centers are connected to one network and to our fantastic information technology system.

**WH:** Do the centers treat only liver disease?

**WD:** Yes. In 2015, we conducted another survey to determine the prevalence of hepatitis C infection. We discovered, around four to five percent of Egyptians have hepatitis C.

**WH:** Why is the number so low as compared to the earlier estimates?

**WD:** Good question. I do not know.

**WH**: You think it was a matter of false positives?

**WD:** Perhaps.

**WH:** The World Bank report estimated the presence at seven percent.

**WD:** That is correct for those eighteen years old and higher**.** But for all Egyptians our data shows that the prevalence is about four to five percent because it is much lower in people eighteen and younger.

**WH:** Is that because of transmission due to contained needles used during the schistosomiasis eradication effort?

**WD:** Very likely. There were some villages in Egypt in which the prevalence of hepatitis C was fifty percent. Almost everyone who was vaccinated for schistosomiasis was infected by hepatitis C. The last treatment of schistosomiasis in Egypt by injection was in the early 1980s.

**WH:** Were infections the result of use of needles that were not sterilized between injections?

**WD:** Exactly. A typical story would be that if a young child is brought to a doctor for treatment of hematuria as a result of schistosomiasis that he contracted by jumping into the Nile on a hot day. The father would take him to the local medical center. Typically, there would be a group of about fifty kids at the center, all there for the same treatment. The doctor would treat twelve or more at a time with the same needle. The treatment was repeated several times for each child.

There was also an earlier wave of infections most likely caused by repeated use of the unsterilized needles for injecting a vaccine during the cholera epidemic of 1949.

By 2015 we know the prevalence of hepatitis C infection in Egypt was between four and five percent meaning that between four and five million Egyptians carried the virus. Between September 2014 and the beginning of 2018 we treated about two million Egyptians for hepatitis C.

**WH:** That is amazing. Two million people is a lot of people. Where did the money come from for the treatment?

**WD:** The government.

**WH:** Not World Bank?

**WD:** No, no, no, no. Not the World Bank. Egyptian government funds.

**WH:** Please explain the structure of the liver treatment centers**.**

**WD:** I am head of the National Committee for Liver Disease. The liver treatment centers are not a part of the government. We do not receive general support from

the government. We are self perpetuating. We do not receive operating funds from any organization.

**WH:** Who pays for the centers?

**WD:** We pay the costs of every patient who comes for treatment. The government pays twenty pounds, about a dollar and twenty cents US, per patient but does not provide operational funds. We use the per capita income to pay the salaries for the doctors. As National Committee members, we do not take any money.

**WH:** Who pays for the drugs you use?

**WD:** The government.

**WH:** Do I understand you correctly. The liver treatment centers are non-governmental?

**WD:** They are semidetached centers within government hospitals. We must pay all the salaries of the doctors, nurses and information technology people in the centers.

**WH:** How are the centers financed?

**WD:** We have no government budget. Zero budget. That is our strength. Nobody can control us.

**WH:** Do the patients pay you twenty pounds per visit?

**WD:** No, the government pays us the twenty pounds. We certify that a person needs treatment. The government approves and agrees that the person is eligible for treatment. We then initiate treatment, including all necessary tests.

**WH:** Twenty pounds per visit?

**WD:** No, I think we receive twenty pounds per patient per month.

**WH:** Does that cover the cost of the drugs?

**WD:** No, the drugs are supplied to us with no cost. The government buys the drugs and gives them to us at no cost.

**WD:** The twenty pounds per patient per month is used to cover the cost of the logistics of the centers. We have about four thousand doctors working for us.

**WH:** Am I correct, that this is a description of the treatment program before initiating the 100 Million Healthy Lives Program?

**WD:** Yes what I just described was our hepatitis C treatment program up to early 2018. By 2018, we had treated all the patients we knew about. Then we ran out of money. We were only paid per patient. When no more people came we had no more money to sustain the treatment centers. We knew there were many people who were infected but were not treated but we did not know who they were. We were stymied and out of money.
I was approached by the World Bank in 2017 to explore the possibility of initiating a program in Egypt. I was slightly skeptical because I was not very happy about taking a loan. The minister of health at the time approved okayed the loan. President el-Sisi held a meeting on the topic in August 2017. We sat down with the President. He wanted to conduct a national hepatitis C eradication program financed by a loan from the World Bank which would cover the diagnosis and treatment of the disease.

**WH:** Who designed the program?

**WD:** The program presented to the World Bank was designed by the Ministry of Health under the leadership of the previous minister**.**

The hepatitis C program was only one part of a five hundred and twenty million US dollar loan. The loan was designed to cover the costs of screening of the entire Egyptian population for hepatitis C and to provide the funds to treat all those who had evidence of active virus replication, an indication that they would contract serious liver disease, cirrhosis or liver cancer, in the future and that they had the potential to infect others. About one hundred and twenty million dollars of the loan was for detection of hepatitis C infection and another one hundred and twenty five million dollars was for treatment. The remaining part of the loan was signed to strengthen the government's health system unrelated to hepatitis C.

The money does not come directly to us. The money goes to the government and then the government uses it to fund the treatment. We started designing programs to test everyone. Our initial plan was to test all adults over the age of eighteen. We needed to test about fifty million people.

The initial plan was to use a chemo-luminescence test for primary screening. I disliked that it required that a blood sample from each patient to be transported to an offsite laboratory for screening. Each person would then need to return to the screening center the following day for follow up. Fortunately, I learned of a new five minute rapid finger stick test developed by Abbot Laboratories. That meant we could identify patients that had antibodies in their blood, indicating that they had been exposed to the hepatitis C virus. Then, on the spot, we could draw blood for a follow up test, a test called polymerase chain reaction, to determine if the virus was actively replicating. Those that test positive for active virus replication are the ones that need treatment. You may know that there is now rapid finger prick least for the HIV virus and for human papilloma viruses.
As long as we were testing the entire population of Egypt for Hepatitis C the World Bank asked us to determine the height and weight of each person to determine the body mass index (a measure of obesity), and to measure their blood pressure and blood sugar levels. These measurements are designed to identify those people who are overweight, those with diabetes and those with hypertension. The 100 Million Health Lives program is designed to detect and treat obesity, diabetes and hypertension.

**WH:** Was the addition of tests for non-communicable diseases your idea?

**WD:** No, that was the program suggested by the World Bank.

**WH:** What are the per person costs of the antibody and the PCR tests for hepatitis C?

**WD:** The cost of the five minute figure prick antibody test is fifty US cents. The cost for the PCR test is five dollars. This are fantastically low prices.

**WH:** Did you negotiate the price with Abbot and Roche?

**WD:** Yes. I am becoming an expert in negotiating prices. After several intense discussions, we reduced the price of the antibody test to fifty US cents.

**WH:** What does it cost in the United States?

**WD:** Seven dollars at Walgreens.

**WH:** Please describe how you collect the information.

**WD:** We equipped every doctor and nurse with an electronic tablet for recording the information for each patient so that it could be uploaded in real time to our information system. We trained everyone on how to use the tablets.

**WH:** Who supplied the tablets?

**WD:** We received them from the World Health Organization.

**WH:** Did they give them to you for free?

**WD:** Yes. I believe they were paid for by a USAID program.

**WH:** How many tablets did you receive?

**WD:** About five thousand. We have a fantastic information system.

**WH**: I was very impressed by the real time dashboards I saw at your war room several weeks ago. All relevant data regarding the progress of the screening and hepatitis C treatment program is displayed in real time, with easy to understand graphics. Did you develop the system, including the dashboards and interface with the tablets, yourself?

**WD:** Our information technology team developed all the software.

**WD:** We initiated screening on October 1, 2018 in eleven districts. We added eleven more in December 2018 and in March 2019 we added eight more. We are now screening people throughout the entire country.

**WH:** How many people have been screened to date?

**WD:** Forty six million.

**WH:** Wow! When I was here six weeks ago the number was thirty million.

**WD:** My job is to make sure every single number is authenticated.

**WH:** Let me ask you another question. One thing we did not go through is the PCR test.

**WD:** We have screening centers and mobile units everywhere.
The 100 Million Healthy Lives is a presidential initiative. Everyone is keen on doing everything correctly. Otherwise, the president would not be happy.
All Egyptians have a personal identification number. The first thing we do on entry is check the personal number. By 2018 we had already screened and treated more than two million Egyptians for hepatitis C infection. If they have already been tested then we do not repeat the test.

**WH:** Is the body mass index, blood pressure and glucose level measured for those who were already treated for hepatitis C?

**WD:** Yes. They undergo all of the tests except for hepatitis C.
All people who test positive in the hepatitis C antibody test are immediately referred to a center that conducts a polymerase chain reaction test that measures the level of viral RNA in the blood. There are about twenty five PCR testing centers throughout the country.

**WH:** Am I correct that the PCR test location is different from the site of primary antibody screening?

**WD:** Yes. They are not co-located. People are told to go to a PCR testing site immediately, usually the next day. Many of the PCR testing sites are located within hospitals.

**WH:** What is the percentage of compliance with PCR?

**WD:** 100 percent. Everyone does PCR.

**WH:** Really? 100 percent?

**WD:** No, not actually. Some people who discover that they are antibody positive go to a private laboratory for further tests and possible treatment. We are trying to dissuade them from doing that. I want them to come to us, not go to private facilities. When we began we used PCR machines and tests from Roche. The entire test, including the machines which we received for free, costs us five dollars per test. The same test cost one hundred dollars or more in the United States.

We eventually changed suppliers. The original Roche instruments were unreliable. I remembered one that failed the very first day it was installed. The Roche technicians told us that was normal! We now use two different networks for the PCR test.

**WH:** What fraction of people who test positive for hepatitis c antibodies are positive by the PCR test?

**WD:** About eighty percent.

**WH:** What percentage of those who test positive for the antibody are lost to your follow up?

**WD:** I will bring you up to date on the numbers so far. We have tested forty six million using the antibody test. Approximately two million are positive. Of these two million, we have initiated treatment with the antiviral hepatitis C drugs of about six hundred thousand. About four hundred thousand people that we know are positive by the PCR test have refused treatment at our centers. We do not know what happens to the remaining million people. They disappear from our follow up.

**WH:** Why do they disappear? This seems to be an important role in the eradication program?

**WD:** Some people are simply terrified by the news that they are infected. Some eventually do come in for treatment.

**WH:** If you are not able to treat that half the people won't be difficult to eradicate the disease.

**WD:** We provide free treatment. Many of the people who are lost to our follow up maybe being treated privately. Perhaps our treatment centers were overcrowded or perhaps some feel that our treatment centers are unpleasant so people opt for private treatment. The cost of private treatment is very low only about one thousand five hundred pounds or about seventy US dollars.
We plan to finish our high volume screening program by the end of April. We will maintain some low volume screening centers.

**WH:** I thought you were going to screen all one hundred million Egyptians?

**WD:** No, we will screen anybody over the age of eighteen, about sixty million people.

**WH:** Isn't school screening part of your program?

**WD:** Yes. We are screening high school children. We are screening high school students now. We will screen about six million high school students. To date, we have found that less than one percent of the high school students we screened are positive by the antibody test.

**WH:** How do you test for diabetes? Is that a blood test?

**WD:** Yes, it is a blood test.

**WH:** How much does the test cost?

**WD:** There is another group of people involved. I cannot tell you the numbers.

**WD:** If blood sugar is over two hundred the person is referred for treatment to a government hospital. The government treatment centers for diabetes and hypertension are very well organized.

**WH:** Is hypertension also treated?

**WD:** Yes.

**WH:** How much does it cost to treat hypertension?

**WD:** I do not know.

**WH:** I would like to follow up our conversation with additional interviews by phone when I return home. I do believe I met briefly with the woman who was directing the obesity, diabetes and hypertension screening.

**WD:** Yes, you did.

**WH:** Does the government health infrastructure support the treatment of people with diabetes and hypertension that you will identify?

**WD:** Hypertension, diabetes and obesity are not my areas of expertise. I will refer you to the people who are responsible for those programs.

**WH:** Thank you. That will be very helpful. I am curious. Are you directing the entire 100 Million Healthy Lives program including that for hepatitis C as well as that for non communicable diseases?

**WD:** I am head of the entire program, but I do not have detailed knowledge of the part devoted to the NCDs.

**WH:** Do you happen to know the prevalence of HIV infection in Egypt?

**WD:** Not exactly. I can also refer you to a doctor who will have the information.

**WH:** Thank you. I would appreciate the referral.

**WD:** We do treat some people who are co-infected with hepatitis C and HIV. We have specialized clinics that treat those who are co-infected with both viruses.

**WH:** What is next for you?

**WD:** I am going to finish this program.

**WH:** And then?

**WD:** I am a professor at Cairo University. I have worked on the issues of hepatitis C surveillance and treatment since 2006, for thirteen years. I am satisfied with what we have done. It is time for a new generation of younger people to take over. I will support them.

**WH:** If I remember you were thinking about practicing medicine in the United States. What changed your mind?

**WD:** In 1981, I went to the United States. I had a green card. I passed a medical exam to work as a doctor in the United States. I found a job in New York as a resident of internal medicine. It is a dream of all doctors all over the world. I remember that time very well. I was at Cairo University. I came to the United States just for two weeks stay. I told the head of the residency program, I would think about it. It was a Saturday. He said if I did not come in on Monday, I would lose the position. I remember sitting in Central Park that Sunday night deciding if I should go back or not. I decided, no. I am going back.

**WH:** You have performed a great service for your country.

**WD:** Hepatitis C infection is a world wide problem. The World Health Organization estimates that seventy one million people in the world carry the hepatitis C virus. WHO estimated that one hundred and seventy million people were infected by hepatitis C only five years ago. The current estimate is one hundred million lower. I do not understand the difference in the two estimates. Egypt leads the world in hepatitis C treatment. Presently four million of the seventy one million infected by hepatitis C have been treated. Of the four million two point five million are Egyptians treated here in our country. With the efficacy of the treatments, the safety, and the cost, it is a crime that anyone anywhere is living with an untreated hepatitis C infection. Many of those infected who are not treated will suffer from cirrhosis and liver cancer. We should break the monopoly of the drug producers.

**WH:** Are you working to help other countries?

**WD:** We have been asked to advise Pakistan, Georgia, and Ethiopia. Pakistan is a country of two hundred and twenty million people. About twelve million people in Pakistan carry the hepatitis C virus. To date, only one hundred and two thousand have been treated. Treatment costs the same in Pakistan as it does here.

**WH:** Why aren't more people treated?

**WD:** When we first began to treat people in Egypt with sovaldi at the price we negotiated, one thousand dollars per treatment, we were viciously attacked in the press and elsewhere. Our critics said the price was too high.
Healthcare in Egypt is poor for most people. Primary care in this country is not effective. The 100 Million Healthy Lives Program is unique. It is a very focused effort. If we were to try to deliver this type of service and care for other problems it would not work because we do not have the necessary supporting infrastructure.

**WH:** After our conversation, I can understand why the surveillance and treatment program for hepatitis C is effective. Will the treatment for diabetes and hypertension also be effective? Those conditions require lifelong treatment and monitoring, not a three month long intervention.

**WD:** We have established an effective long term treatment program for hepatitis B. People are treated for hepatitis B for six months at government expense. That is the same type of program that would apply to the treatment of diabetes and hypertension.

**WH:** Are the long term treatment programs for diabetes and hypertension operating today?

**WD:** The plans exist on paper. I do not know whether or not the plans are as yet official.

Let me add some additional details about the structure of the hepatitis C treatment program. The liver treatment centers I established are independent of the government. The doctors and nurses who work there are not paid for by the government. We are a totally independent body. Nobody can pressure us. We can also give independent advice to the government without fear of consequence.

If you want to have a program succeed, you have to have this kind of situation. Plus, you must have a free hand to supervise, to organize, to reward good performers and to punish people who do not work.

Egypt is still very much a developing country. The economy is much better now. The government has more money to spend on healthcare. We do have options about what we will do going forward. Based on my experience, I favor focused programs where we can see rapid improvement and measure impact. I believe that at our stage of development, rather than trying to meet the global health standards in all areas, we should create additional dedicated focused programs, like hypertension, diabetes, hepatitis C, hepatitis B, and HIV. Each program should be totally separate. People who are in charge of these programs should be able to make decisions of what is needed to achieve their objectives. They should be individually accountable for the results.

**WH:** This has been a very valuable conversation. I hope to learn more about this truly revolutionary program. Congratulations on your success to date.

**WD:** You are welcome.

END

.