'We have a public health emergency': the real story of AIDS in Florida

Exclusive interview with Dr. Mark Whiteside

Dr. Mark Whiteside is the Co-Director of the Institute of Tropical Medicine in Miami, Florida. He was interviewed on Sept. 17, 1985 by Dr. John Grauerholz, one of the co-authors of EIR*'s Special Report* Economic Breakdown and the Threat of Global Pandemics.

Grauerholz: What is your own background in the treatment of AIDS?

Whiteside: We are a private, non-profit clinic associated with Florida International University and Southeastern College of Medicine. My associate, Dr. Joan McCleod, and I run the tropical medicine program. We have a complete traveler's clinic: immunizations, travel counseling, and treatment of individuals with travel illnesses and tropical parasitic diseases. We've seen most of the major riskers for AIDS, including the early cases among patients at Memorial Hospital. We've given comprehensive AIDS screening amongst sexually active gay men, and have seen several thousand gay men for screening purposes in the last three years—work that we began in Key West approximately two years ago. For the last year and a half, I've headed the tropical clinic at the Palm Beach County Health Department, which is operated two days a month in Belle Glade, Florida.

Grauerholz: What is the current situation in Belle Glade?

Whiteside: There are several outstanding features about the disease in Belle Glade. First of all, there is a very high incidence; we have at least 46 confirmed cases in a town of 20,000 people. We have a very different pattern of the disease, with slightly less than 50% of our cases falling into the typical, classical risk groups, when you include the individuals born in the Caribbean as well as individuals born in the southeastern United States but lacking other risk factors for the disease. Finally, all of our AIDS patients in Belle Glade had long-term residence in central depressed neighborhoods . . . where we have high incidences of other diseases, including tuberculosis, parasitic diseases, viral diseases, etc.

Grauerholz: What is the current breakdown on these 46 cases?

Whiteside: Fourteen intravenous drug users, six homosexual/bisexual men, one infant pediatric case, 14 individuals born in Haiti, one individual born in Barbados, and 10 men and women born in the southeastern United States without pre-existing risk factors, that is, no homosexual, no intravenous drugs, no blood products, and, with one exception—a female whose first husband died from AIDS—with no central contact with anyone known at this time to have AIDS.

Grauerholz: In a letter from the Centers for Disease Control to one of the co-authors of the *EIR* Special Report on *Economic Breakdown and the Threat of Global Pandemics*, the CDC director writes: "In your letter you mentioned specifically the current outbreak of the Acquired Immune Deficiency Syndrome in Belle Glade, Florida. At the invitation of the Florida Department of Health and Rehabilitation Center for Disease Control, CDC has been conducting an investigation of a cluster of cases of AIDS in Belle Glade, in cooperation with local public health officials. And this is of August 25. Most of the patients reported in Belle Glade have known risks for AIDS, such as homosexuality or intravenous drug use. If the AIDS virus were transmitted by insects or crowded and poor living conditions, we would expect more of the patients to be children. Although some migrant farm workers encounter problems with housing, health care, education, and other socio-ecqnomic conditions as seen in Belle Glade, no available evidence establishes a cause and effect relationship between socio-economic conditions in transmission of HTLV-III, the virus which causes AIDS." Do you agree with that assessment?

Whiteside: No, I don't agree. I know the patients better than anyone else, because I have worked in Belle Glade for two years, have run the clinic up there for the past year-and-a-half, and have seen most of the recent cases of interest of AIDS. The majority of our recent cases have been, in fact, No Identifiable Risk (NIR) or Carribbean-born cases, and we are seeing an increase in that group of non-characteristic patients, and we feel that slightly more that half of our patients are certainly not in the strict high-risk group. In fact, most of our non-characteristic cases are not explained by heterosexual transmission patterns (and we have other physicians, including physicians from the state and from CDC, also interview our patients).

This is something that is only going to be further evalu-

ated with time. We do feel that the tremendous parallel between diseases like tuberculosis and AIDS in these environmental and poor areas, are indirect evidence for relation to living conditions and perhaps socio-economic conditions. And we are seeing the same kind of pattern develop in other areas of South Florida.

I would emphasize that we feel that the pattern of AIDS in Florida is strikingly different from much of the rest of the country. We have more cases in young and female, black, Hispanic, a greater percentage of Caribbean individuals, probably higher incidences of NIR cases, more opportunistic infection, higher mortality—the list goes on and on. So increasingly, we think that the pattern of the disease down here, and in a place like Belle Glade, more resembles the pattern of the disease in the tropics, i.e., the Caribbean or even Central Africa—especially the pattern of the disease among our non-risk cases, where the disease manifests multiple opportunistic infection and a high incidence of tuberculosis.

I personally feel that it is a rather narrow viewpoint to state that AIDS is caused by a single strain of one viral agent, HTLV-III, and that this virus can only go by blood or through secretions, as

And if one is cognizant of veterinary literature, dating way back, it is apparent that animal retroviruses are most strongly suspected of being mechanically transmitted by biting insects. I think that in an area where you have human crowding and an abundance of biting insects, it would certainly be reasonable and appropriate to investigate possible patterns of mechanical transmission of retroviruses, of which HTLV-III is an example.

Grauerholz: Earlier we discussed suggestions I had about screening populations, initially with a blood test, and then following up with clinical examinations of diagnosed cases. What is your opinion of a public health approach?

Whiteside: We have preliminary evidence to support environmental factors. We are looking at a number of such factors in the environmental surveys we have done over the past two years in the course of our active field work in a number of areas in South Florida. We have a particular interest in insect-transmitted disease, and we are looking at repeated exposure to some of the regular insect-transmitted viruses (arboviruses) in relation to AIDS. Of course, worldwide there are over 500 different insect-transmitted viruses, a smaller number of which cause human disease, but we are becoming more focused in looking at a particular group of arboviruses: the bunyamora viruses, which have approximately 20 members worldwide and are more common in certain tropical areas. Our preliminary evidence is that virtually 100% of the non-risk cases that we have tested to date in South Florida had antibodies to one of those arboviruses, which, even if it had nothing to do with AIDS, would show that our patients are getting environmental exposure. It is known experimentally that arboviruses—like Venezuelan equine encephalitis or Goroa virus—can trigger or enhance the production of retroviruses. We are looking at a dynamic model of interaction of different viral agents, in which living in a poor environment in certain endemic areas, increases one's chances of getting certain viral infections that can weaken one over time. One might become more susceptible to a disease like tuberculosis, and then, with further worsening, more susceptible to AIDS.

That's the kind of model we're looking at. We've always favored a multi-factoral approach, that is, the role of multiple infection. But now, we are beginning to be more focused on one particular viral infection: arboviral infection. We think that these viruses may be, so to speak, "aberrantly transmitted" through blood mechanisms in other risk areas of the United States—i.e., specific sexual practices of gay men, with needles by drug users, direct introduction in the rare cases in transfusion of hemophiliacs, etc. Obviously, you are talking about viruses that are blood transmitted. . . .

The harder question to answer, is how you prevent the disease in the tropical groups, and perhaps even in some of the non-characteristic cases that we are seeing in an area like Belle Glade. We counsel such individuals about sexual practice; and, of course, even heterosexuals have to be more careful at this point in time about their choice of sexual partners. We counsel also about environmental diseases, about nutritional status, and about simply keeping the home environment as clean as one can. We even talk about removing containers that collect water that breed urban mosquitoes—these so-called old-fashioned environmental control measures that were necessary in the past to control epidemics, for example of yellow fever and dengue fever, both of which can be transmitted by *Aedes aegypti*, an urban mosquito highly adapted to man's dwellings in artificial containers that collect water.

It's crucial insofar as our prevention goes, to at least recognize environmental factors. Of course, that is the first step, and one could clearly take steps to control environmental factors, especially if it is limited to certain environmentally poor areas within endemic regions. We think that this relates directly to maintaining and improving public health measures. *We think that we are clearly in danger of a decline in public health within the United States as well as in other parts of the world, and we think that has to be the top priority.*

Grauerholz: We talked to one fellow who was in the entomology end of this thing, who basically said that they are really not training any vector-control people at this time.

Whiteside: We have forgotten the environment a little bit. On a worldwide basis one could argue, I think, that we are losing the war against some of the major tropical kinds of diseases, and against some of the vector diseases such as malaria. And even some of the arboviruses like dengue are showing further spread, with a potential for an even worse

disease such as dengue hemorrhagic fever, which has been reported in several Caribbean countries. It ultimately relates again to basic public health measures. For control of dengue, for example, you are not talking so much now about chemical sprays and this kind of thing—especially as now so many mosquitoes have developed resistance to pesticides—but about environmental control measures, that is, removing the containers, getting rid of the water from the containers, larvicide in some situations where you can't get rid of the water, and public education; because you are really nowhere without public education to maintain those measures.

Grauerholz: We are advocating large infrastructure projects in the Third World, a priority of which would be water management to deal with food supply and sanitation at the same time. Water management in Africa would deal with both malnutrition and disease, in terms of irrigation and vector control. This would be the critical point at which one could actually intervene in those situations.

Whiteside: The moral to this whole story is yet to unfold, but I think that the spread of this disease is related to environmental change within endemic areas, and perhaps, as you suggest, a disruption of some of the epicenters of disease, through social upheaval, wars, alteration of landscapes. I think we are going to need an effort to restore some of that balance if we hope to control this disease. One interesting thing about AIDS: If it is, as we believe, a tropical-based and even environmental-based disease, then while most of the disease has been found in so-called risk groups in the United States, the pattern is very different in the tropics, where in many areas in Central Africa, men and women heterosexuals without other risk factors are infected with the disease. The pattern is strikingly different, but I would maintain and argue that you have to control the disease in the tropics, if you hope to control it in the United States.

Grauerholz: One would certainly move to prevent the tropic type of condition from spreading, in the sense of the New York situation, where you have these localized pockets with AIDS and tuberculosis growing together, under conditions which are essentially similar except for the climate.

Whiteside: That's of interest, because it would not surprise me to find the same parallel in distribution of those kinds of diseases which we see . . . in areas around the world, and certainly where AIDS is now endemic in Central Africa and the Caribbean.

Grauerholz: You mentioned one extremely interesting thing; this question of recombination going on between these arboviruses and, say, retroviruses in these infected individuals.

Whiteside: We are now looking at what would be considered a theoretical model, but there is certainly test-tube evidence to support these concepts. For example, the bunyamora serogroup arboviruses that we're looking for antibodies to, as well as virus in mosquito and viral antigen in tissue. This serogroup has 20 members. The virus is composed of three species; there are three pieces of RNA—small, medium, and large—and in the test tube different members of the serogroup readily exchange their RNA pieces, to form hybrid viruses. That would be recombination and, in a sense, mutation. So certainly there is the potential for more virulent agents, especially as you bring together people from different parts of the world; and therefore viruses, that were once ecologically separated, and evolved within a certain ecological niche.

One model we are looking at is recombination-mutation potential for increased virulence. The second feature which we are looking at, which would seem to be the case for a number of arboviruses and perhaps exemplified by dengue virus, is *immunological enhancement* of infection. This model in which antibodies to one virus, paradoxically, stimulate or increase the growth of a closely related virus. In one of the four subtypes of dengue, you get sick with flu-like illness for a week or so, and when you recover over time, your antibody may be in decline, so you are still potentially susceptible to other, worse dengue subtypes. The *in-vivo* model (this can also be shown nicely *in vitro*) may be dengue hemorrhagic fever, which is a killing form of dengue which would generally only occur in an individual with previous exposure to dengue virus.

Interestingly, in the test tube, the bunyamora viruses show the same phenomenon of immunological enhancement of infection. We are talking about a model of worse disease through exposure; and in Belle Glade we would look at that kind of model, where a patient may have early exposure to these viruses, perhaps even from their mother, and then, growing up, they have a chance from outdoor work, from fishing, from working in the fields, coming home where there are no windows or screens or air conditioning, such exposure over time would be of course much greater . . . and now perhaps they are becoming exposed to very similar agents, for example, what may be introduced from the Caribbean, causing what we would call an enhanced immunopathological effect, and perhaps the activation of other viruses, including retrovirus. So again, we are looking at that dynamic interaction between these different model groups.

Grauerholz: That's extremely interesting, for two reasons. It has been recently reported that about 2% of patients who are carrying HTLV-III will test negative for antibody, and it turns out that apparently the virus is mutated. The same report discusses a protein which enhances the reproduction of the virus, and I would wonder if that protein is, in fact, simply one of these immunological enhancement products of a previous infection.

Whiteside: It certainly could be. I think that we are going to have to develop a multifactorial model. AIDS has myriad clinical manifestations and even clinical differences among

the risk groups. For example, nearly all the clinical Kaposi's sarcoma has been in a single risk group, gay men. This makes it difficult for me to believe that all AIDS was caused by a single viral agent, working alone. I think the majority of scientists may now feel that other co-factors may be important, and that it is not just one virus.

Another very interesting observation, which indicates environmental spread of these kinds of diseases (including even retroviral), is the observation in a recent article in *Science,* that in a sample of otherwise healthy children who were used as controls for individuals with Kaposi's sarcoma—in other words, healthy African children, average age six—fully two-thirds had antibodies to HTLV-III. And I just don't see how, in that kind of setting, you can possibly ascribe that to sexual activity. A current *Lancet* has an article showing that antibodies to retroviruses from Africa—HTLV-I, II, and III—correlate extremely closely with antibodies to *Plasmodium falciparum,* which would indicate, at least in one hypothesis, a similar mode of transmission, and also a possible link to a parasitic infection, as other researchers have indicated.

That is why we are interested in the incidence of parasitic disease as a rough measure of people with contamination, because it is at least a theoretical possibility, that a viral kind of agent could be carried in a parasite and gain entry into the body in that mode. There is some limited evidence, by electron microscopy, that certain parasites may harbor viral kinds of agents. . . .

We consider that HTLV-III certainly is a marker of the disease; it is a risk factor, and there is a close parallel, although it is not 100%. It may well be a co-factor, which further depresses immunity through actual destruction of lymphocytes. But our own particular viewpoint is that retroviruses may not be the prime mover. We're looking at a model in which initial insult may be regular arboviruses which are known to be immunosuppressive. And limited experimental evidence shows that arboviruses may induce the production of retroviruses.

Grauerholz: An interesting case is dengue hemorrhagic fever, which appears to be simply a progressive mutation of the basic dengue virus.

Whiteside: Tropical disease specialists have been arguing about this for some time, but I think the majority would favor, in the case of dengue hemhorragic fever (which caused an epidemic in Cuba in 1982) an *in-vivo* model of immunological enhancement of the infection, a model of worse disease, with an exposure to a different dengue sub-type over time. The initial exposure can be from a previous episode of dengue fever, as from a mosquito-transmitted disease. Or, in the case of infants, they may get maternal antibody, which is in decline during the first year of life, making them susceptible to hemmorhagic fever; and then they get their first insect exposure.

Another interesting part of immunological enhancement *in vitro:* You see more enhancement of infection with increased dilution of antibodies. In other words, you may be at increased risk over time when that antibody level is in decline, and may be so from a very minute amount of antibody. Some people think there may be a sub-population of enhancing antibodies, or else a balance between specific neutralizing antibodies and enhancing antibodies. That is a wonderful area of research, because a great deal is still not known. But this is not inconsistent with the idea that more virulent strains of these viral agents may exist. For example, some of these dengue subtypes have proven to be more virulent, capable of causing worse and more pronounced disease. So those two hypotheses are not mutually exclusive.

In the case of the bunyamora group, we think both things may be operating. In other words, you may well have reached recombination, and therefore, mutation, and you may well have immunological enhancement of infection.

Grauerholz: It is a good argument for killing mosquitoes.

Whiteside: I think that we must relearn some of these old-fashioned public health measures. We have not identified any vectors. We would regard urban mosquitos as suspect vectors, simply because they are the most efficient carriers of arboviruses. In particular, we are looking at *Aedes aegypti,* the urban vector of dengue and yellow fever and past urban epidemics. We are also looking at *Culex quinquifasciatis,* the southern house mosquito, which breeds around the house and likes containers that collect water. But unlike *Aedes aegypti* which likes clean water, *Culex quinquifasciatus* will breed in grossly dirty, polluted water, and even in raw sewage and latrines in Central Africa. This urban mosquito is not only highly adaptable, it is an efficient vector of arboviruses, and can be a vector of *filariasis* in some parts of the tropics. It is so striking when you plot the cases on a map, because what you end up with is maybe a dozen cases of AIDS and a dozen cases of tuberculosis on the very same block. Now, I would certainly call that a public health emergency. And even heterosexually transmitted disease is not going to literally confine itself to poor neighborhoods. It just doesn't go that way. . . .

We're looking at environmental factors, perhaps even insect-transmitted disease, as the primary mode, with secondary transmission through sexual contact, especially specific sexual practice and other blood mechanisms; that's what we're talking about: blood.

Grauerholz: I think if you look at the total of AIDS cases in the world, you probably find most of them in Africa, where that's the mechanism.

Whiteside: Where that may well be the mechanism. My hope is—especially since we think the recognition factor is so important—that data coming out of the tropics will inevitably support an environmental hypothesis.