

Stained Glass and Flu

[Announcer] This program is presented by the Centers for Disease Control and Prevention.

[Sarah Gregory] I'm talking today with Dr. Robert Webster about his original, scientifically relevant stained glass window. Dr. Webster is an Emeritus member of the Department of Infectious Diseases at St. Jude Children's Research Hospital. Welcome Dr. Webster.

[Robert Webster] Good afternoon. I am delighted to be here.

[Sarah Gregory] We're delighted to have you. So let's start with the term One Health. What does it mean?

[Robert Webster] One Health is actually a very ancient concept where you cannot separate diseases in animals from diseases in humans. They are completely inseparable. But, having said that, in the field of influenza and in many diseases, there's been reluctance to accept this concept of continuation of diseases from animals to humans. This is because we have departments of veterinary science, departments of human public health, and departments of ecology for the wild animals of the world. And with influenza, it's been extremely interesting over the years—first, on the reluctance of the veterinarians and the humans to sort of get together on this concept. It is understandable because the influenza viruses in chickens that can kill a chicken overnight, or in pigs, are rather different from those in humans. So there was always some reluctance to accept the idea. But it was in 1955 that Werner Schäfer in Germany showed that the influenza viruses that killed chickens and in humans were molecularly identical. And so they were all influenza viruses. So then over the years, we have built up the acceptance of influenza.

So where do the influenza viruses that cause pandemics in humans come from? Do they come from lower animals and how do they come across into humans has always been the big question. And when we resolved the reservoirs of influenza in the aquatic birds of the world—the wild ducks and the wild free-flying aquatic birds—there was somewhat skepticism that these viruses in wild birds that were nonpathogenic—completely nonpathogenic—could possibly be the origin of the influenza viruses that later killed chickens or eventually transferred to humans and become pandemic strains. But then the World Health Organization played a major role in bringing these different areas together; the veterinary arms and the human arms came together—probably through the WHO—to bring these fields together. But it really wasn't until the bird flu incident occurred in Hong Kong that there was acceptance that, of the fact that, influenza viruses in the chickens could spread to humans and not only cause disease but kill humans. And so, and this was rather recent—1997—that that occurred. Then when we had the pandemic in 2009, with the advent of molecular sequencing, we could really tell that the newly emerging viruses could be traced back right to the aquatic birds of the world. So this is somewhat of a long diatribe on influenza and the One Health System, but that's how it came about for influenza.

[Sarah Gregory] That's a very fascinating history. So how did One Health become interwoven with stained glass?

[Robert Webster] So how did this happen? On a very wet day in 1989, my wife and I were walking on Hadrian's Wall which separates Scotland from England, that the Romans had built,

and is a UNESCO heritage site now. And, it was a very wet day, and for lunch we went into the local pub, and found a book that had a picture of a stained glass window that a local lady—a stained glass artist—had produced of a dragon. And so we looked her up, found that Jenny Hammond lived in the hills nearby, and decided to drive to her home, and discussed the possibility of making a stained glass window to depict the One Health concept of influenza, showing how the viruses developed from the aquatic birds of the world, spread through the pig to the human. And she agreed in principle to doing this, but she had no idea of influenza.

She was a country lady who did art pieces that had no background in science. So we sent her some reviews of influenza and some electron micrographs of influenza and she sent back some pencil sketchings. This was really in the days before easy internet and so on, and so over the course of the next year we came to the agreement that the stained glass window outline should—as you see it now—should depict this natural history of influenza.

[Sarah Gregory] Well, for listeners who may not be looking at an image of it, can you describe it?

[Robert Webster] The stained glass window is 21 inches wide and 56 inches tall and occupies a space beside our entryway into our home. We had recently moved into this house, and had this wonderful open space to fill, and both my wife and myself were really into stained glass windows and decided that that would be the place to have this stained glass window displayed.

[Sarah Gregory] So there's a bird and a pig, and what else in the stained glass itself?

[Robert Webster] The stained glass window contains, the top section contains the aquatic birds which is a mallard duck, and together with a pig and a human, and these animals are interconnected with the “came” strips, the lead strips that connect the pieces of the stained glass. So these interconnect these animals and they also connect to a globe at the top corner, depicting the global nature of influenza in the world, and then we have the animals and below, the bottom section of the window displays the molecular concept of influenza. This brilliant red through the top section indicating the high fever that occurs with influenza and in the bottom section is the influenza virus itself with eight segments of RNA. And occasionally, there are combinations of two different influenza virus particles, of reassortants, showing how influenza viruses reassort and generate recombinant reassortant viruses that can spread between the different hosts. So that, briefly, is the nature of the window.

[Sarah Gregory] That's quite an achievement for an artist with no scientific background. Does the piece have a title?

[Robert Webster] The title of the piece is, “The Natural History of Influenza Viruses,” and which is—seem—logical.

[Sarah Gregory] Yes indeed. I understand that getting the piece back to the U.S. was quite a challenge.

[Robert Webster] Yes. Getting a stained glass window from the very north of England back to Memphis, Tennessee was no simple matter. The question was how to transport it to the airport. How could we carry it? Could we carry it as personal baggage? Or should we have it air-

freighted? And after lots of discussion we decided well, we would go and pick it up and carry it as personal baggage. And so, Jenny's husband made a magnificent multi-ply box for the stained glass window and we had to hire the largest station wagon that was available in England to carry the large piece. Then, when it came to security at Heathrow, it was a case of how do we have this thing examined? Are we going to have to take it out of its box? And the box just fitted through the scanners at the airport, and the security people admired the pieces of stained glass as they went by.

[Sarah Gregory] You must have been on the edge of your seat the entire time for fear it would crack or something on the plane.

[Robert Webster] We were a bit nervous when we opened the box because we thought that some of the pieces, the delicate pieces of glass may have been cracked. There was one tiny, tiny crack in one segment, and you would never see it.

[Sarah Gregory] Oh! Oh! Well, yes...I can't imagine getting that through security, frankly. Have you collected any more scientifically relevant stained glass pieces?

[Robert Webster] No, we simply admire them. We're really not collectors of stained glass because stained glass windows of those dimensions don't come cheap and we had collected photographs of other stained glass windows, but not stained glass because that was impossible for us.

[Sarah Gregory] It's certainly a very interesting story of the whole process and I thank you so much for talking with me today.

[Robert Webster] You're most welcome.

[Sarah Gregory] Listeners can read Dr. Webster's cover art story online at cdc.gov/EID.

I'm Sarah Gregory for Emerging Infectious Diseases.

[Announcer] For the most accurate health information, visit www.cdc.gov or call 1-800-CDC-INFO