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'Wi-fi refugees' shelter in West Virginia mountains

By Jane O'Brien & Matt Danzico BBC News, Green Bank

There are five billion mobile phone subscriptions worldwide and advances in wireless technology make it increasingly difficult to escape the influence of mobile devices. But while most Americans seem to embrace continuous connectivity, some believe it's making them physically ill.

Diane Schou is unable to hold back the tears as she describes how she once lived in a shielded cage to protect her from the electromagnetic radiation caused by waves from wireless communication.

"It's a horrible thing to have to be a prisoner," she says. "You become a technological leper because you can't be around people.

"It's not that you would be contagious to them - it's what they're carrying that is harmful to you."

Ms Schou is one of an estimated 5% of Americans who believe they suffer from Electromagnetic Hypersensitivity (EHS), which they say is caused by exposure to electromagnetic fields typically created by mobile phones, wi-fi and other electronic equipment.

Hiding in a cage

Symptoms range from acute headaches, skin burning, muscle twitching and chronic pain.

"My face turns red, I get a headache, my vision changes, and it hurts to think. Last time [I was exposed] I started getting chest pains - and to me that's becoming life-threatening," Ms Schou says.

To alleviate the pain, her husband built an insulated living space known as a Faraday Cage.

He covered a wooden frame with two layers of wire mesh and a door that could be sealed shut to prevent radio waves from entering.

Diane spent much of her time inside it, sleeping on a twin mattress on a plywood base.

"At least I could see my husband on the outside, I could talk to him," she says.

Diane believes her illness was triggered by emissions from a mobile phone mast.

Her symptoms were so severe that she abandoned her family farm in the state of Iowa and moved to Green Bank, West Virginia - a tiny village of 143 residents in the heart of the Allegheny Mountains.

Outlawed wireless technology

Green Bank is part of the US Radio Quiet Zone, where wireless is banned across 13,000 sq miles (33,000 sq km) to prevent transmissions interfering with a number of radio telescopes in the area.

The largest is owned by the National Radio Astronomy Observatory and enables scientists to listen to low-level signals from different places in the universe.

Others are operated by the US military and are a critical part of the government's spy network.

As a result of the radio blackout, the Quiet Zone has become a haven for people like Diane, desperate to get away from wireless technology.

"Living here allows me to be more of a normal person. I can be outdoors. I don't have to stay hidden in a Faraday Cage," she says.

"I can see the sunrise, I can see the stars at night, and I can be in the rain.

"Here in Green Bank allows me to be with people. People here do not carry cell phones so I can socialise.

"I can go to church, I can attend some celebrations, I can be with people. I couldn't do that when I had to remain in the Faraday Cage."

But EHS is not medically recognised in the US.

Debated 'condition'

The wireless association, CTIA, says that scientific evidence overwhelmingly shows that wireless devices, with the limits established by government regulators, do not pose a public health risk or cause any adverse health effects.

And the World Health Organization, while acknowledging that the symptoms are genuine and can be severe, says: "EHS has no clear diagnostic criteria and there is no scientific basis to link EHS symptoms to EMF (electromagnetic field) exposure. Further, EHS is not a medical diagnosis, nor is it clear that it represents a single medical problem."

However, new research by scientists at Louisiana State University and published by the International Journal of Neuroscience, claims to show that EHS can be caused by low frequency electromagnetic fields found in the environment.

"The study provides direct evidence that linking human symptoms with environmental factors, in this case EMF," says Dr Andrew Marino, a neurology professor who led the study.

"It's a watershed in that regard. There have been no previous studies that scientifically assess whether electromagnetic fields in the environment could produce human symptoms.

"And the symptoms matter because they are the first steps that show how EMFs produce human disease."

Scientists conducted a number of tests on a 35-year-old physician who had diagnosed herself with EHS.

She was seated on a wooden chair while voltage was applied to metal plates for pulses of 90 seconds to create a series of magnetic fields. The woman was asked to describe her symptoms after each exposure and after random sham exposures when, unknown to her, there was no voltage.

She reported headaches, pain and muscle twitching during the genuine exposures and no symptoms for the majority of the sham exposures.

The scientists concluded that such consistency could not be attributed to chance.

But other experts still disagree that a link exists.

Technological 'ignorance'

Bob Park is a physics professor at the University of Maryland.

He says that the radiation emitted by wi-fi is simply too weak to cause the type of changes in the body's chemistry that could make people sick.

"The bigger problem that we face is that in our society, driven by technological change, people have very little education," he says.

"There are lots of things people need to learn and they're not learning it. The thing that's going to kill them is ignorance."

Seventy-year-old Nichols Fox says she understands such scepticism - it took several years before she became convinced that her debilitating pain and fatigue were caused by electromagnetic radiation emitted by her computer.

"Towards the end of my normal life when I still could watch television I could actually cut my pain off and on with the remote control device," she says. "It was such an enormously clear association there was just no denying it."

Her symptoms are so severe that she has isolated herself almost entirely, living in a remote house surrounded by fields and woods just outside the Quiet Zone. She says even the low-level electromagnetic fields generated there affect her health.

She uses hardly any electricity - her refrigerator operates on gas, light comes from kerosene lamps and a wood-burning stove provides most of her heat.

A thermostat is set to switch on electric heaters if the temperature drops to a level where she is in danger of hypothermia.

"It's so important that people understand that this is a very serious disability, it's a life-changing disability. It leads to an earlier death - I have absolutely no doubt about that and I think it's just unfortunate that this is not recognised," she says.

But even in this secluded part of America, the incursion of wireless technology is relentless. Planning permission has been granted for a cell tower a few miles from her home, and Nichols says she'll have to move.

"I'm getting older and I really don't know where I'm going to go or what I'm going to do," she says. "It's really quite frightening."



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