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Ebola Virus I

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One of the greatest threats to mankind these days is a lethal virus. Some, like HIV, which causes AIDS, have affected the human race greatly. The full effects of AIDS on the earth's population is not yet known, it can only be estimated. However, none are as terrifying as the sisters Ebola and Marburg are. They are members of a family of RNA viruses known as filoviruses. When magnified with an electron microscope (see photograph below), the virus particles have the appearance of thin pieces of thread and are thus referred to as thread viruses or "worms". The most lethal ones are the three sisters: Ebola Zaire, Ebola Sudan and Maburg. These viruses have no vaccine and no known cure.

Marburg, although not the most widespread of the three, is perhaps the most deadly. It has the infectious capability of the common cold and kills nine out of every ten people it infects. Marburg emerged in 1967, when it killed seven people in the town of Marburg, Germany. It broke out in a vaccine factory where they were using the cells of monkeys from Uganda. In all, 31 people caught the virus before it burnt itself out. It is much like radiation sickness in that there is substantial hair loss and massive internal bleeding. It would later emerge in Belgrade, Yugoslavia.

Virologists made Marburg a Level 4 virus. Virus containment (or biocontainment) is divided into four biosafety levels, based on infectious capability and potential for harm. Biosafety level 1 is of minimal hazard - Salmonella, E.Coli, etc. Level 2 is moderate biohazard and includes Hepatitis and Influenza. Level 3 is of a high biohazard and multiple vaccinations are required to work within it. Level 3 includes Anthrax, Typhus and HIV. Level 4 means extreme biohazard. Level 4 laboratories maintain maximum security. The infectious agents - Ebola and Maburg, Lassa Fever and Hanta, are all highly virulent and there exists no vaccines or cures.

When working in a level 4 laboratory, you have to wear special clothing for protection. These are known as "space suits", because they resemble the suits astronauts have to wear. Oxygen is pumped directly into the suit, never coming in contact with the contaminated air in the lab. In theory, they completely protect the person inside the suit from what lives in the air around them.

There are two types of suits - Chemturion and Racal. Chemturion suits are blue in colour and are for working in laboratories. When working in a lab, an air hose is plugged into the suit. Air circulates around the suit by way of the "blowers". The blowers make a lot of noise and technicians often have to wear earplugs. Then there is the yellow or orange Racal suit. These have a battery-operated air supply incorporated into the suit and are disposable. They are for fieldwork only.

A Level 4 laboratory is kept under constant negative air pressure. This means that if there is a leak, or something else goes wrong, the contaminated air would be sucked back into the laboratory instead of to the outside world. To get into a Level 4 lab, you have to go through an airlock and a decon (decontamination) shower on the way back out. It is policy for all work to be done in pairs so that they can each check each other's suits regularly.

All of the above measures are needed to contain and work safely with Level 4 viruses such as Marburg.