

Prevalence of HIV in Africa is leading to new strains of *Salmonella*, say scientists

LIVERPOOL, UK – 12 April 2010: Scientists at the University of Liverpool have discovered that dangerous strains of *Salmonella* are beginning to emerge in people infected with HIV in Africa.

Their research has found that, in adults with HIV, new African *Salmonellae* can cause severe disease by invading cells in the blood and bone marrow, where they can hide away, allowing them to evolve into more dangerous, multi-drug resistant strains over time. This is made possible by the loss of immune cells that occurs in HIV which renders the body vulnerable to attack.

In Europe and the US, *Salmonella* normally causes diarrhoea and is rarely fatal, but in Africa, the new multi-drug resistant strains exploit vulnerable children and adults, causing severe infections that are difficult to treat and leading to death in one in four cases.

Previous work at the University of Liverpool in collaboration with the Wellcome Trust Sanger Institute, showed that new epidemic human strains of *Salmonella* are unique to Africa and have evolved to give a greater potential to cause serious disease. Researchers showed the strains, which were previously non-invasive, have now developed genetic similarities to the *Salmonella* bug that causes Typhoid Fever. This is significant because as well as being antibiotic resistant, their behaviour is likely to be intrinsically more invasive and aggressive than typical strains found in the US and Europe. This evolution has probably been driven by the context of the HIV epidemic.

The fact that the cells can persist inside cells in the blood and bone marrow confirms that these strains are behaving in a new and highly invasive fashion. It means that the infections are difficult to treat, and often persist and recur. This in turn means that conditions continue to be favourable for more bacterial adaptation, and for the evolution of more antibiotic resistance.

Dr Melita Gordon, Senior Lecturer and Consultant in Gastroenterology in the University of Liverpool, who carried out the work in partnership with Liverpool School of Tropical Medicine and the Malawi-Liverpool Wellcome Trust Major Overseas Unit, said: "This suggests that the high rate of HIV and other diseases that affect the immune system in

Africa has provided an environmental niche in which new, more dangerous strains of *Salmonella* have been able to emerge.

"We are now studying ways in which these multi-drug resistant infections can be treated better without encouraging the emergence of newer forms of resistance to antibiotics. We should also be able to use the new genetic markers to track and understand the spread and habits of *Salmonella* in Africa much more effectively."

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The research was funded by the Wellcome Trust and is published in *Clinical Infectious Diseases*.