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## Aids: is the end in sight?

By Steve Connor, Science Editor, in San Diego

*Mass prescription of anti-retroviral drugs could eradicate the disease within 40 years, scientist says*

Testing everyone at risk of HIV and treating them with anti-retroviral drugs could eradicate the global epidemic within 40 years, according to the scientist at the centre of a radical new approach to fighting Aids.

An aggressive programme of prescribing anti-retroviral treatment (ART) to every person infected with HIV could stop all new infections in five years and eventually wipe out the epidemic, said Brian Williams of the South African Centre for Epidemiological Modelling and Analysis.

Dr Williams is part of a growing body of experts who believe that anti-HIV drugs are probably the best hope of preventing and even eliminating the spread of Aids, rather than waiting for the development of an effective vaccine or relying solely on people changing their sexual lifestyle.

The idea will be tested in the coming year, with the start of the first properly controlled clinical trial involving thousands of people living in a part of South Africa with a high incidence of HIV and Aids. Dr Williams said this will be followed by similar trials in the US, where HIV is rampant among some inner-city communities.

"Our immediate best hope is to use ART not only to save lives but also to reduce transmission of HIV. I believe if we used ART drugs we could effectively stop transmission of HIV within five years," Dr Williams said. "It may be possible to stop HIV transmission and halve Aids-related TB within 10 years and eliminate both infections within 40 years," he told the American Association for the Advancement of Science in San Diego, California.

Anti-retroviral drugs dramatically lower the concentration of HIV within a person's bloodstream, and, in addition to protecting patients against Aids, they

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significantly lower an individual's infectiousness - their ability to transmit the virus to another person.

Dr Williams and his supporters believe that if enough infected people are treated, it would lower the rate of infection to such an extent that the epidemic would die out within the lifetime of those undergoing the treatment. Aids could effectively be wiped out by the middle of this century, he said.

"The problem is that we are using the drugs to save lives, but we are not using them to stop transmission," Dr Williams said. Blocking transmission can only be done with an extensive testing regime followed by rapid treatment with anti-retroviral drugs to everyone found to be HIV positive, he said.

"The concentration of the virus drops 10,000 times [with ART] ... This probably translates into a 25-fold reduction in infectiousness. But if you did this it would be enough essentially to stop transmission," he said.

A study published in 2008 showed that it is theoretically possible to cut new HIV cases by 95 per cent, from a prevalence of 20 per 1,000 to 1 per 1,000, within 10 years of implementing a programme of universal testing and prescription of ART drugs.

"Each person with HIV infects, on average, one person every one or two years. Since people with HIV, and without treatment, live for an average of 10 years after infection, each person with HIV infects about five to 10 people," Dr Williams said. "Treating people with ART within about one year of becoming infected would reduce transmission by about 10 times. Each person with HIV would infect, on average, less than one other person and the epidemic would die out."

ART drugs have to be taken on a daily basis for life, and the cost for South Africa alone would be about \$4bn (£2.6bn) per year. However, Dr Williams said that the cost of having to treat a growing number of Aids patients, as well as the economic cost of young adults dying off, would be higher than giving out free ART drugs to everyone who needs them.

"The key issue of cost is that if you don't do anything it costs you a lot of money. In South Africa we spend a lot of money on people who are hospitalised with infections related to HIV," Dr Williams said. "More importantly, we are killing young adults in the prime of their life just when they should be contributing to society. The cost to society of that is enormous.

"If you factor all of the costs into the equation then, in my opinion, doing this is a cost saving from day one because the cost of the drugs will be more than outweighed by the costs of treating all of these people with other diseases," he said. "A friend of mine said that the only thing that is more expensive than doing this is not doing this."

The first full-scale clinical trial is being planned in Hlabisa in Somkhele, about 220km north of Durban. It will be designed to test whether it is possible to ensure that people who are taking ART drugs comply with the strict prescription regime of daily pill taking, as well as discovering whether transmission rates fall below the level needed to sustain the epidemic.

"One quarter of the global cases are in southern Africa and one half of these are in South Africa, so South Africa is extraordinarily badly affected," Dr Williams said.

"We could stop transmission quickly, but it doesn't end the problem because people are infected with HIV for life. So we really are in it for the long term. We

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need to do a lot of operational research before we can consider this seriously as a public-health intervention, but there is a lot of enthusiasm for it," he added.

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