Study backs Libya HIV case medics

Scientists have cast doubt on charges that five Bulgarian nurses and a Palestinian doctor deliberately infected Libyan children with HIV.

The medics could face the death penalty if found guilty by a court in Tripoli later this month.

An international team analysed samples taken from the infected patients. Writing in Nature, they said their work showed the HIV subtype involved began infecting patients in Libya well before the medical workers arrived in 1998.

An initial trial condemned the medics to death in 2004, but the Libyan Supreme Court overturned the verdicts, and ordered a retrial.

The defendants are accused of knowingly infecting more than 400 children with HIV in the eastern town of Benghazi.

The medics say that they were tortured into giving false confessions.

The first trial lasted almost six years, and the medics have been in jail since 1999.

They say the children were infected through poor hygiene - and a body of scientific work supports their claims.

"All the lines of scientific evidence point in the same direction."

Dr Tulio de Oliveira
Oxford University

History of outbreak

The researchers worked on blood samples collected by a network of European clinical research centres that are involved in treating the infected children.

By analysing mutations in the genetic material of the HIV virus found in the samples they were able to reconstruct the history of the outbreak.

In a statement, researchers Dr Tulio de Oliveira and Dr Oliver Pybus, from Oxford University, said: "All the lines of scientific evidence point in the same direction, towards a long standing infection control problem at the hospital, dating back to the mid 1990s or earlier."
Dr Thomas Leitner, of Los Alamos National Laboratory, has provided forensic evidence in many HIV cases.

Writing in Nature, he said the latest research was "compelling evidence that the outbreak had started before the accused could have started it."

There has been mounting international pressure on Libya to hear independent scientific evidence.

International experts say the scientific report used in the trial was nothing but 'conjecture' and 'supposition'.

Last month 114 Nobel Laureates wrote an open letter to Colonel Gaddafi urging the appropriate authorities to hear independent science-based evidence, and reaffirming the need for a fair trial.
Too late?
New molecular evidence supports the innocence of medical workers held in Libya, but whether it will be considered is an open question.

Credit: Georgi Milkov

Genetic Analysis Clears Accused Medics
By John Bohannon
ScienceNOW Daily News
6 December 2006

A new molecular study provides the strongest scientific evidence yet that six foreign medics held in Libya are innocent of charges that they deliberately infected more than 400 children with HIV. Accumulated mutations in the virus genomes reveal that the outbreak began well before the medics arrived in the country. The Libyan supreme court is set to decide on 19 December whether to execute the medics. It is unclear whether the new study will influence its verdict.

International criticism of the Libyan government has intensified since October, when the country’s supreme court refused to consider scientific evidence in the case against the medics (ScienceNOW, 24 October). Prosecutors charge that the medics—five Bulgarian nurses and one Palestinian doctor—infected 426 children at a hospital in Benghazi as an act of bioterrorism. But European scientists who gained access to the hospital’s records in 2004 discovered that 32 of the infected children had been treated at the hospital before the accused medics had even arrived. Also, the diversity of viruses, which include several strains of hepatitis in addition to HIV, suggested a classic hospital outbreak due to poor hygiene practices rather than a deliberate inoculation from a single source.

The new genetic analysis of the viruses tells a similar story. A team led by Oliver Pybus, an evolutionary biologist at the University of Oxford, U.K., obtained blood samples from 66 of the Libyan children who had been sent to European hospitals for care. They extracted and sequenced RNA from 41 strains of HIV as well as 61 strains of hepatitis C virus infecting the children. Because the viruses accumulate mutations as they reproduce and spread, differences between their genomic sequences can be used like a molecular clock to estimate how long ago they last shared a common ancestor. The more mutations that have accumulated in each strain, the longer back in time that the hospital outbreaks must have occurred.
The molecular evidence is solidly in favor of the medics' innocence, Pybus and his coauthors conclude. All of the analyses performed put the date of the outbreak well before the medics’ arrival in Libya in March 1998, the team reports online today in *Nature*. For some strains of the hepatitis C virus, the most likely date of the original hospital infection was before 1995, indicating that poor hygiene practices--such as reuse of needles and improper sterilization techniques--have been causing accidental infections there for more than a decade.

"I am persuaded," says Jeff Thorne, a molecular biologist at North Carolina State University in Raleigh who specializes in viral evolution. "This study shows that the accused medical staff are innocent beyond a reasonable doubt."
WASHINGTON DC

In a notable move aimed at curbing fraud in scientific publications, the journal *Science* said last week that it will probably begin targeting certain "high-risk" papers for extra scrutiny.

The move comes in response to a report from an external committee convened by the journal to assess its handling of the papers behind the Woo Suk Hwang fraud scandal. And it turns on its head — for a handful of papers at least — the traditional presumption that manuscripts submitted to a journal are researched and written honestly.

"Until now, it has been assumed as a default that scientists are honest. The burden of proof is to show that they are not. Now, at least for a select number of papers where the risk factor is high, there is a new burden, to show that these papers are honest," says Sheldon Krimsky, a bioethicist at Tufts University in Medford, Massachusetts.

Hwang, a South Korean researcher working at Seoul National University, published high-profile papers in *Science* in 2004 and 2005 that claimed to have generated embryonic stem cells by somatic-cell nuclear transfer. This is a key step to generating replacement tissues from cells by somatic-cell nuclear transfer. This is a category, "he wrote.

Such papers, perhaps ten a year, would receive "special attention" that could include greater requirements for including primary data and more intensive evaluation of digital images. The journal would also demand explicit descriptions of each author’s contribution to a paper.

Even as Kennedy announced the plans, *Science* reported doubts about the results of another high-profile paper it recently published in a controversial area of developmental biology. Pending the outcome of an investigation by the University of Missouri, Columbia, this will also probably be retracted.

In a paper that sparked debate from the moment it was published, R. Michael Roberts and colleagues, researchers at the university, claimed that mouse embryonic cells have distinct developmental fates from the first cell division onwards. This flies in the face of the broadly held view that in mammals such cells can still develop into any cell in the body. The paper was published on 17 February this year, and the university launched an investigation in April that is still continuing.

Kennedy cautioned in a press briefing that the social costs associated with loss of trust among scientists might be greater than those of the occasional retraction. But he said he would collaborate with *Nature* and other journals to draw up a common set of standards aimed at deterring fraud. Philip Campbell, *Nature*'s editor-in-chief, declined to comment in detail on the committee’s findings, but said: "We at *Nature* welcome the external review conducted by *Science* and are considering its recommendations."

Molecular HIV evidence backs accused medics

International experts in DNA forensics say that a paper published online by *Nature* this week provides a firm alibi for the six medical workers facing the death penalty in Libya. The workers have been charged with deliberately infecting more than 400 children with HIV in 1998.

In the study, an international team led by researchers from Oxford and Rome used the genetic sequences of the viruses isolated from the patients to reconstruct the exact phylogeny, or ‘family tree’, of the outbreak. Analysing the mutations that accumulated over time allowed the researchers to work out when different outbreaks occurred. They showed that the strain of HIV with which the children had been infected was already present and spreading locally in the mid-1990s, long before the medics arrived in Libya in 1998.

The trial of the six medical workers ended in Tripoli on 4 November, and a verdict is expected on 19 December. Despite mounting international pressure to free them, defence lawyers are pessimistic about the outcome, and *Nature* has fast-tracked publication to make this new evidence available before the verdict (see *Nature* 444, doi:10.1038/nature444836a; 2006).

There was already a body of scientific evidence indicating that the outbreak was caused not by deliberate transmission, but by poor hygiene at the Al-Fateh hospital in Benghazi, where the outbreak took place (see *Nature* 443, 888–889; 2006). Analysis of hospital records suggested that the outbreak began before the medics arrived.

Almost half of the HIV-infected children were also infected with hepatitis B or C, pointing to poor hospital practices as the cause. The new results provide independent genetic confirmation of these findings. As well as showing that the outbreaks predated the medics’ arrival, the study suggests that the HIV strain is related most closely to strains from West Africa, suggesting a natural introduction, probably via the many migrant workers in Libya, says co-author Tulio de Oliveira of the University of Oxford, UK.
But many commentators seem to feel that the recommendations don’t go far enough. “There should be very strict criteria not only for high-impact or controversial papers but for everybody,” says Thereza Imanishi-Kari, an immunogeneticist at Tufts. Imanishi-Kari’s career stalled when her work became the subject of a high-profile US government investigation in the 1990s. She was exonerated. “Krimsky also favours increased scrutiny of papers: “What could the negative impacts be? A less trusting community of scientists? A new McCarthyism? I don’t think that’s likely.” He adds that a further criterion should trigger extra scrutiny of papers: where an author or authors have an unusually high degree of commercial interest in the results.

Meanwhile, Arthur Caplan, director of the Center for Bioethics at the University of Pennsylvania in Philadelphia, says he would like to see the criteria expanded to include papers in areas with a history of fraud and those in highly specialized areas where relatively few other scientists would be equipped to detect such problems. He adds: “I think you have to be blunt and say that papers coming from certain countries also raise red flags. China has not yet been convincing and South Korea has problems.”

But Kennedy said in the press briefing that he would guard against any targeting of foreign scientists. “We don’t want to engage in profiling. It would really be unfair if we started looking extra hard at some of the papers from emerging scientific powers in countries such as South Korea.”

Meredith Wadman

Other phylogenetic analyses of HIV have been used in court cases involving allegations of HIV infection. The first was in 1991, when a Florida dentist was shown to have contaminated his patients. The technique has since been accepted as evidence in dozens of cases involving rape, hospital infection transmissions and people with HIV knowingly exposing others in Sweden, France and elsewhere.

Thomas Leitner of Los Alamos National Laboratory in New Mexico has provided forensic HIV evidence in more than 30 such cases over the past 15 years. He describes the de Oliveira paper as “compelling evidence that the outbreak had started before the accused could have started it”, a view shared by every expert that Nature contacted (see ‘Expert opinion’).

Leitner points out that calculating evolutionary timescales is tricky, but that because HIV has such a fast mutation rate, even recent events can be pinpointed quite accurately. “De Oliveira et al. have tested and evaluated the clock and its uncertainty using several methods,” he says. “I find their analysis well done and timely, and hope it will affect the judgement in the Libyan court.”

Declan Butler

High-impact papers, such as those submitted by Woo Suk Hwang, would be subjected to extra scrutiny.

Expert opinion

The following scientists have all previously testified in court cases involving HIV molecular evidence. They assess the new data.

This study is an impressive statistical analysis. It shows clearly that the hypothesis of deliberately injecting children with HIV in 1998 should be rejected.”

Philippe Lemey, expert on HIV evolution, Rega Institute for Medical Research, Belgium.

This is exactly the kind of objective phylogenetic analysis needed in this case. The results clearly show that the health workers were not responsible for the introduction of these HIV strains.”

David Hillis, expert on viral phylogenies, the University of Texas, Austin.

This kind of analysis has been approved by courts around the world. This is a case of [hospital] infection with multiple, independent sources, a pattern most easily explained by sloppy or inappropriate practices at the hospital.”

Fernando González Candelas, evolutionary geneticist, the University of Valencia, Spain.

The existing epidemiological data are already enough to demonstrate that the accused medical staff cannot be the source of the contamination. De Oliveira’s analysis is completely independent, and yields the same conclusion. The court cannot pretend to be impartial if it refuses to hear any competent scientist from abroad.”

Michel Milinkovitch, evolutionary geneticist, the Free University of Brussels, Belgium.

They have used state-of-the-art methods to estimate divergence and dates of events in this outbreak. The analysis shows compelling evidence that the outbreak had started before the accused could have started it.”

Thomas Leitner, expert in HIV evolution, Los Alamos National Laboratory, New Mexico.
Medics face death while Libya uses HIV children as diplomatic pawns

Alex Duval Smith
The Observer, Sunday 17 December 2006 13.12 GMT

The death in Libya six weeks ago of nine-year-old Marwa Annouiji from Aids was much more than just another developing world statistic. In her short, life, dominated by illness, the frail child was a pawn in a high-level game of international relations.

Marwa, from al-Bayda on the Mediterranean coast, was the 52nd Libyan child to die as a result, Libya claims, of a deliberate operation by foreign medical workers to pump HIV-infected blood into 426 girls and boys at the al-Fatah Hospital in Benghazi.

On Tuesday, barring some extraordinary intervention, the six medics - a Palestinian doctor and five Bulgarian nurses who have been in prison in Libya for seven years - will have their sentence confirmed by a court in the capital, Tripoli: execution by firing squad. The case has sparked unprecedented mobilisation in support of the medics among international scientists who have found the Libyan evidence groundless.

European governments and the United States stand accused of abandoning the medical workers for powerful strategic and economic reasons.

'We are still hoping wisdom will prevail,' said the head of the nurses' defence team, French lawyer Emmanuel Altit. 'The court has not granted the defence its rights, the Libyan evidence in the case is discredited, and the medics' confessions were extracted under mental, physical and sexual torture.'

The six - Dr Ashraf al-Hajuj and nurses Kristiyana Vatcheva, Nasya Nenova, Valentina Siropulo, Valya Chervenyashka and Snezhana Dimitrova - took up government contracts at the hospital in Libya's second city in March 1998. The first cases of HIV infection were reported the same year. A World Health Organisation report found that the virus had probably been spread because of a lack of proper medical equipment. The six were imprisoned in March 1999. Libyan courts ordered reports from the world's top Aids scientists and epidemiologists, including Luc Montagnier, one of the discoverers of HIV. Montagnier found the high rate of hepatitis B and C at the hospital suggested that poor hygiene was to blame for the spread of HIV. But the prosecution ignored his report and ordered one from Libyan researchers in 2003.

On 6 May, 2004, the death sentences were pronounced. On Christmas Day last year the Libyan Supreme Court ordered a retrial, which led to a new call for the death sentence this August. A verdict is expected on Tuesday.

European doctors who, under a 2m (£1.3m) EU initiative, have treated the children in Libya say most are now aged around 12. They suffer from tuberculosis and other Aids-related illnesses.

According to a French foreign ministry spokesman: 'They cannot so much as go to the dentist in Benghazi because the Aids stigma is so powerful in Libya. It also appears that, because most of them are outpatients, their parents are not all administering their tablets correctly.' As a result of care problems in Libya, the 374 surviving children are now outpatients at hospitals in Italy and France.

Libyan President Muammar Gadaffi, who is reportedly terrified of dissent in the opposition hotbed of Benghazi, is paying millions of euros for their treatment at the Vatican's Bambino Gesu Hospital as well as at French clinics in Lyon, Montpellier,
Experts on Libya say Gadaffi is using the children as a pawn in his discussions with Western powers over burning issues including contracts for oil, arms and aircraft and diplomatic relations in the Middle East. Gadaffi also remains bitter about the pariah status he acquired after the 1988 Lockerbie bombing. Earlier this year Libya said Bulgaria should pay the families of the children $2.7bn (£1.8bn) in compensation - which is exactly the sum paid by Libya for the 270 lives lost in the Pan Am 103 bombing.

International scientists say the 2003 Libyan report was written by 'pseudo experts' and has no value. Last week a paper in Nature magazine by a team led by British evolutionary biologist Oliver Pybus showed that the Benghazi strain of HIV was introduced at the hospital before the arrival of the medics.

Pybus, of Oxford University, said: 'By looking at the genome sequence of the virus found in children at Bambino Gesu hospital, we established that the estimated date of the most common recent ancestor for each cluster predated March 1998, sometimes by several years. The virus is of a kind found in West Africa, which makes sense as Libya has a large population of guest workers from there.'

The medics' lawyers hope that, even if the death sentences are confirmed on Tuesday, the case will return to the Supreme Court where a judicial council could throw it out for a second time. But Altit said diplomatic efforts to secure the medics' release after more than seven years in jail had been disappointing. 'Libya is coming out of the cold and there are many lucrative contracts in the works. If the sentences are confirmed it will be a disgrace for the European Union. If there is one thing Europe stands for, it is values, such as justice.' A Foreign Office spokesman would not comment on the accusation that European governments were sacrificing the medics in the name of trade relations. But he said: 'The case is not over yet and we understand it will go to the Supreme Court. The EU has made significant efforts to help the families and upgrade facilities at the hospital. We hope these efforts show that everyone sympathises with the families.'
New and compelling scientific evidence has emerged in support of five Bulgarian nurses and a Palestinian doctor accused of deliberately spreading HIV to 426 Libyan children in 1998.

The evidence redoubles the international pressure on Libyan president Colonel Muammar al-Gaddafi to ensure that the six are acquitted when the Libyan court issues its verdict on 19 December.

By examining viral extracts from some of the children, Oliver Pybus of the University of Oxford and his colleagues were able to work backwards to establish that specific mutations in 40 per cent of the HIV cases evolved before the nurses arrived at the Al-Fateh Hospital in Benghazi in March 1998. Likewise, 70 per cent of the children with hepatitis C, which can also be spread through dirty needles, contracted it before the arrival of the nurses (Nature, DOI: 10.1038/nature44836a). The analysis concludes that both viruses spread through poor hospital hygiene.

The big question now is whether the court accepts the evidence even though the trial ended on 4 November. "We'd like it to be heard or taken into account somehow," says Pybus.
Experts blame hospital hygiene

Research has always suggested that the infected children contracted HIV because of poor hygiene and sterilisation practices at al-Fateh hospital which predated the arrival of the health workers in Libya.

The case against the “Benghazi Six” was further weakened by a study published this month. A team led by Tulio de Oliveira of Oxford University used samples of HIV taken from infected children being treated in Europe to trace the genetic history of the viral subtype in their bodies.

As genetic mutations accumulate at a fixed rate, this can provide an accurate timescale for the outbreak, and the results showed that the HIV subtype was already infecting patients long before March 1998, when the accused staff arrived.

Oliver Pybus, a member of the Oxford team, said yesterday: “There are just too many genetic differences between the infections for them to have all occurred since the arrival of the foreign medical staff — it’s that clear.”

Further evidence that supports the medical workers has been compiled by Professor Luc Montagnier of the Pasteur Institute in Paris — who discovered HIV — and Vittorio Colizzi, of Tor Vergata University in Rome.

Their analysis of practices at al-Fateh hospital concluded that the outbreak probably began in April 1997 with a single child who was already infected with a sub-Saharan strain of HIV when admitted.

The virus then spread to other children because needles, catheters and other medical devices were not properly sterilised.

Many of the patients were also infected with hepatitis C, which is transmitted in the same way as HIV, pointing further towards poor hygiene as the likely origin of the outbreak.
New Evidence Disputes Libya’s Case in H.I.V. Trial

By REUTERS

LONDON, Dec. 6 (Reuters) — Scientists have produced new evidence that casts doubt on charges against five Bulgarian nurses and a Palestinian doctor accused by Libya of deliberately infecting 426 children with the virus that causes AIDS in 1998.

A team of international scientists who reconstructed the history of the virus from samples from the Libyan children has shown that a subtype of H.I.V. began infecting patients at Al Fateh Children’s Hospital in Benghazi before the foreign medical team arrived.

“The evidence shows the chain of infection started a few years before the arrival of the foreign staff accused of causing it deliberately,” Dr. Tulio de Oliveira, a molecular virologist at Oxford University, said in an interview.

A retrial of the six health workers ended in Tripoli last month. The prosecutor demanded the death penalty after five Libyan experts in H.I.V. and AIDS stood by their 61-page report, written in 2003, that found that the infections of the Libyan children had resulted from an intentional act.

A Libyan court is expected to deliver a verdict on Dec. 19.

The six medical workers, who have protested their innocence and said their confessions were made under torture, arrived in Libya in March 1998. They have been detained since 1999.

The international team of scientists, whose findings were published online Wednesday by the journal Nature, analyzed the genetic code of H.I.V. and hepatitis C viruses from the children to determine when the outbreaks started. “All of them give a date for the start of the epidemic around the mid-1990s,” Dr. de Oliveira said.

He added that a team of 10 specialists from around the world who reviewed the research concluded that the results were “extremely solid.”

The medical workers were sentenced to death by firing squad after being convicted in a trial in 2004. The verdict was quashed last year by Libya’s Supreme Court, and the case was sent to a lower court.

In an open letter to the Libyan leader, Col. Muammar el-Qaddafi, published last month in Nature, more than 100 Nobel laureates in the sciences called for a fair trial for the medical workers.
New Evidence Exonerates Foreign Medics in Libyan AIDS Trial

Washington
06 December 2006

New biological evidence casts more doubt on Libyan government charges against six imprisoned Bulgarian and Palestinian medical workers accused of deliberately infecting several-hundred Libyan children with the AIDS virus. The medics face the death penalty if convicted, but as VOA’s David McAlary reports from Washington, laboratory tests support their claims of innocence.

Researchers from the Universities of Oxford and Rome provide an alibi for the five Bulgarian nurses and one Palestinian physician.

Libya says the six purposely injected 426 children with HIV in 1998 at Al-Fateh hospital in Benghazi, shortly after they arrived in the country. Their trial ended in Tripoli on November 4 and a verdict is expected December 19.

But the British and Italian scientists say their laboratory analysis of virus samples from several of the children indicate that the Libyan accusation is untrue.

University of Oxford co-researcher Oliver Pybus puts it this way.

"We tried to do the analysis in lots of different ways and use lots of different approaches, but pretty much every way that we tackled the problem, we were getting a probability of pretty close to zero that these outbreaks had actually started since the arrival of the Bulgarian medical staff," he explained.

Pybus and his colleagues came to this conclusion by studying the genes in the Libyan children's AIDS virus samples. They looked at the genetic sequences, the particular patterns of genes, to reconstruct the exact history of the outbreak. Analyzing genetic mutations that had occurred over time allowed them to work out when different outbreaks took place.

Their findings, published in the journal Nature, indicate that by 1998 about 40 percent of the children were already infected by an HIV variant that had been spreading locally for several years. Pybus's team says it is related most closely to strains from West Africa, suggesting it came from the many migrant workers in Libya.

"This shows that the strain that had given rise to the outbreaks at Al-Fateh Hospital in Benghazi had been circulating for some time prior to the arrival of the Bulgarian medical staff in 1998," said Pybus.

An expert who has provided forensic HIV evidence in more than 30 such cases in the past 15 years praises the research. Thomas Leitner of the U.S. government's Los Alamos National Laboratory issued a statement calling it compelling evidence that the outbreak had occurred before the accused could have started it.
The findings add to a growing body of evidence exonerating the six. For example, a European study of blood samples from several of the Libyan children found that many were also infected with hepatitis B and C, suggesting poor hygiene at the Libyan hospital.

"These kinds of infections are most like to have been hospital acquired infections for which there is no evidence to link any specific individuals," said epidemiologist Janine Jagger, who heads the University of Virginia's International Healthcare Worker Safety Center, and calls the Libyan trial very troubling.

"What is really needed at this point is as loud an international outcry as is possible to save these people from the firing squad," she concluded.
AIDS research backs healthcare workers jailed in Libya

A Palestinian physician and five Bulgarian nurses are accused of injecting 426 children with HIV.

By Thomas H. Maugh II, Times Staff Writer

December 7, 2006

A genetic analysis of the AIDS virus in Libyan children appears to exonerate a Palestinian physician and five Bulgarian nurses accused of deliberately injecting 426 children with HIV at a Benghazi hospital in 1998, researchers reported today.

The genetic history of the human immunodeficiency virus indicates that it is a common West African strain that was circulating in Libya long before the group's arrival, a British and Italian team reported in the journal Nature.

The findings contradict the Libyan government's claims that the children were infected with an exotic, perhaps man-made, form of the virus and that the country was the only African nation with no cases of the deadly disease before the healthcare workers arrived in March 1998.

A verdict in the workers' second trial is expected Dec. 19, and scientists hope the analysis results will lead to an acquittal.

The so-called Benghazi Six — Palestinian Dr. Ashraf Alhajouj and Bulgarian nurses Snezhana Dimitrova, Nasya Nenova, Valentina Siropulo, Valia Cherveniashka and Kristiana Valcheva — have been imprisoned in Libya since 1999.

"The data are pretty clear that the infection in the hospital was obviously there before the Bulgarian health workers arrived," said viral geneticist David M. Hillis of the University of Texas at Austin, who was not involved in the research. "It is clear proof that the Bulgarian healthcare workers did not infect the children in the hospital."

Thomas Leitner, who maintains an HIV sequence database at Los Alamos National Laboratory in New Mexico and who also was not involved in the research, said, "I find their analysis well done and timely, hopefully affecting the judgment in the Libyan court."

But Libyan courts already have rejected scientific evidence suggesting that the infections were the result of poor hospital hygiene, and it is not clear how the new data will be received.

There have been suggestions that Libya would free the workers if their governments paid about $5.5 billion in "blood money" to the families of the children — more than double the amount Libya has paid to the families of passengers on Pan Am Flight 103, which crashed in Lockerbie, Scotland, in 1988 after a bombing carried out by Libyan intelligence officers.

"It is critical to recognize that the unfortunate Benghazi Six ... are pawns in a far larger game," said Laurie Garrett of the Council on Foreign Relations in New York.

The six were part of a larger group of volunteers who came to Al Fateh Hospital in Benghazi in 1998 to help care for patients.

During the course of that year, 426 children at the hospital were diagnosed with acquired immune deficiency syndrome. At least 50 have died. The majority of those who survived were sent to Europe for treatment that was not available in Libya.

The following year, 19 of the foreigners were arrested, and 13 were subsequently released.

The six remaining detainees confessed to deliberately infecting the children, but they and Amnesty International later said the confessions were obtained by torture.
including beatings with barbed wire, electroshock, dog attacks and other abuses.

Dr. Luc Montagnier of the Pasteur Institute in Paris and Dr. Vittorio Colizzi of the University of Rome Tor Vergata presented evidence at the first trial, including a preliminary analysis of the virus, indicating that the infections had begun long before the foreign workers arrived.

The fact that most of the children were also infected with hepatitis B and C indicated that the infections resulted from poor hospital hygiene, particularly improper needle sterilization.

But the court threw out their findings because an investigation by Libyan doctors had reached the opposite conclusion.

The six healthcare workers were convicted and sentenced to death in 2004. Nine Libyan officers accused of torturing them were acquitted in 2005.

In the face of international outrage, the Libyan Supreme Court quashed the conviction and sent the case back to a lower court for retrial.

The Libyan prosecutor in the new trial again called for the death penalty.

A group of more than 100 Nobel laureates wrote a letter published in Nature in October urging that the workers be freed. Another group of researchers published a similar letter, written by HIV co-discoverer Dr. Robert Gallo, in the journal Science, and scientific organizations have added to the pressure.

With the new verdict looming, Dr. Oliver Pybus and Dr. Tulio de Oliveira of Oxford University worked round-the-clock to analyze viral DNA collected from the children by European doctors.

Along with Colizzi and other co-workers, they reported in Nature that both the HIV and hepatitis viruses isolated from the children were common West African strains that had been circulating in the hospital since at least the mid-1990s.

"We put a 'timescale' on the transmission history of the transmission clusters, which enables us to show that the strains involved were already present and transmitting in the hospital and its environs prior to the arrival of the nurses," Colizzi said in an e-mail.

Neither Pybus nor Colizzi was willing to speculate about how much credence the Libyan court would give the new evidence.

"But now the political action of Western countries is more scientifically based and hence more effective," he said.
Libyan HIV trial twist
BY BRYN NELSON
Newsday Staff Writer

December 6, 2006, 11:00 PM EST

In the latest twist to a court case that has attracted intense scrutiny, researchers have released new genetic evidence that supports the innocence of six medical workers accused by the Libyan government of deliberately infecting more than 400 children with HIV.

After the infections began appearing in 1998, five Bulgarian nurses and a Palestinian doctor were charged with intentionally infecting 418 children at the hospital in Benghazi, Libya. Six years later, a court sentenced the imprisoned medical workers to death, but an international outcry spurred the Libyan Supreme Court to intervene and order a retrial, with a final verdict expected Dec. 19.

The new report, rushed into publication today in an online version of the journal Nature, agrees with a prior finding by two international experts that the viral outbreak began well before the medics arrived in March 1998 at the Al-Fateh Children's Hospital.

"The strains that are involved were already present and circulating either in this hospital or in the local region of this hospital before the medical staff actually got to the country," said Oliver Pybus, head of Oxford University's molecular evolution group and a co-author of the new study.

Pybus and his group helped analyze 44 HIV samples and 61 hepatitis C virus samples from some of the infected Libyan children who received medical care at hospitals in Switzerland and Italy. For their genetic sleuthing, the researchers created a family tree of the rapidly mutating viruses to reconstruct a chronology of the outbreak.

HIV changes so quickly, Pybus said, that the equivalent of a million years of
human evolution can be compressed into a single year. "So that gives us the ability to estimate this time scale at quite a fine level."

Using different evolutionary models for the single HIV strain and three hepatitis C strains implicated in the outbreak, the researchers consistently found that the data pointed to a viral origin predating the medical staff's arrival. Although the evidence didn't allow the researchers to pinpoint the outbreak's exact origins, Pybus said, "it's exactly the kind of pattern we would expect to see from a long-standing infection control problem."

Speaking to The Associated Press, however, Idriss Lagha of the nongovernmental Libyan Union for Children Infected with HIV blasted the study as "baseless and nonsense" and asserted that it relied on a prior analysis rejected by the court.

In their 2003 report, French AIDS expert Luc Montagnier and collaborator Vittorio Colizzi of Italy concluded the epidemic likely arose because of pre-existing hygiene problems and not the subsequent arrival of the medical workers.

A Libyan court, however, threw out those findings, citing what it described as imprecision and a lack of evidence. Instead, the court relied on a report prepared by five Libyan researchers, who concluded that "the data available to us did not contradict the possibility of a deliberate transmission of HIV to the infected children."

Colizzi, an immunologist at the University of Rome, said he couldn't predict how the Libyan court will react to the new report -- which he also co-authored -- and Libyan officials were not immediately available for comment Wednesday.

Colizzi, however, said he hopes the study will convince the court to postpone sentencing until it can consider the new evidence. "Now, finally, we have some more strong evidence about this case," he said. "For us, it's finished. Now it's just a political game."

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Libya sentences medics to death

A Libyan court has sentenced five Bulgarian nurses and a Palestinian doctor to death for knowingly infecting hundreds of Libyan children with HIV.

The medics have been in detention since 1999, during which time 52 of the 426 infected children have died of Aids.

The nurses and doctor were sentenced to death in 2004, but the Supreme Court quashed the ruling after protests over the fairness of the trial.

The defendants say they are being made scapegoats for unhygienic hospitals.

Defence lawyers said the medics would appeal against the new verdict, expected to be the final appeal allowed under Libyan law.

The defence team told the court that the HIV virus was present in the hospital, in the town of Benghazi, before the nurses began working there in 1998.

Western nations had backed the medics' case, calling for their release.

Bulgarian officials quickly condemned the verdicts.

Foreign Minister Ivailo Kalfin described the ruling as "deeply disappointing".

EU Justice Commissioner Franco Frattini expressed his shock at the verdict and urged the Libyan authorities to review the decision.

But the BBC's Rana Jawad in Tripoli, says it is highly unlikely that Libya's leadership will become involved in the case, at least in public.

Celebrations

Parents of the infected children said they were happy with the verdicts.
Some cried out in court as the verdicts were delivered, while others were gathered outside carrying banners.

"For the second time, justice has spoken out with a ruling against those criminals and the punishment they deserve, because they violated their obligations and sold their consciences to the devil," Abdullah Maghrebi, the father of one infected child, told the BBC.

Tsvetanka Siropoula, the sister-in-law of one of the convicted nurses, told the Reuters news agency that the sentence of death was to be expected.

"I am sure they will be released, but it will take time. It is so sad that so many years have passed and they are still in jail."

**Evidence contested**

The medics protested their innocence throughout the case, retracting confessions that they said were obtained under torture.

Medical experts including the French co-discoverer of the HIV virus had testified on behalf of the medics.

And the World Medical Association and the International Council of Nurses said Tuesday's verdict ignored scientific evidence.

Oxford University in the UK said the verdict ran counter to findings by scientists from its Zoology Department.

A research team had concluded that "the subtype of HIV involved began infecting patients long before March 1998, the date the prosecution claims the crime began", a statement from the university said.

Libya has asked for 10m euros (£6.7m) compensation to be paid to each of the families of victims, suggesting the medics' death sentences could be commuted in return.

But Bulgaria has rejected the proposal, saying any payment would be seen as an admission of guilt.
Dr. Oliver Pybus: The Libyan Children were Infected before Arrival of Bulgarian Nurses and Palestinian Doctor

11 December 2006 | 22:10 | Darik Radio

Dr. Oliver Pybus, Oxford University, in an interview with Darik Radio

On December 19th, a Libyan Court is expected to pass final judgements on five Bulgarian nurses accused of deliberately infecting more than 400 children with HIV in Libya. Meanwhile, the problem is not only being internationalized. Two days ago, the new edition of the Nature Magazine published a study by the Oxford University, which proves that the children who were treated in the hospital in Benghazi had been infected with HIV long before the Bulgarian nurses and the Palestinian doctor started to work there. An international team led by Oliver Pybus of Oxford University used the genetic sequences of the viruses isolated from the patients to reconstruct the exact history of the outbreak. The study revealed that the children’s blood was infected before March 1998. Darik Radio got through to Dr. Oliver Pybes. Here is what he said:

Q: Dr. Pybes, how exactly did you test the blood samples from children infected with HIV and what were the results?

Oliver Pybus: The blood samples were taken by our assistants headed by Professor Vittorio Collizi. Prof. Collizi managed to isolate the virus from the blood samples and to reconstruct the sequence of its development. Then, they sent this genetic data to Oxford and our study was focused on analyses of the cases of genetic difference between different viral infections. The origin of the different types of viruses, which the children were infected with, is before March 1998. Consequently, the different viruses, which caused the infection in the Benghazi hospital, were already present in the hospital or around it before the arrival of the Bulgarian and Palestinian medics in March 1998. Another important fact we found out was the origin of the viruses – Western Africa and Egypt. We think they reached Libya by means of the many economic emigrants who travel across Libya to Europe. The Libyan government has already shown concern over the emigrants, who come to the country. This fact reveals the reason why viruses from Western Africa have been found in Libya. The most reasonable explanation of the human-to-human transmission is the poor hygiene in hospitals. We have 44 samples from HIV-infected people and about 60 samples from people infected with Hepatitis C.

Q: How exactly did you prove that the virus got into the children’s bodies before the arrival of the Bulgarian and Palestinian staff in the hospital in Benghazi?

Oliver Pybus: We demonstrated this through many statistic techniques. The number of the genetic differences between the two viruses depends on the period of time during which they had shared a common source. By measuring the different genetic differences between the two viruses, which had been isolated from two infected children, we could estimate how long ago they had shared a common source and how long ago the transmission chain, which separated them, had started.

Q: Can the evidence you have be disputed?

Oliver Pybus: No, not really. We made the analyses very carefully. The pace of the change of the virus absolutely concurs with the genetic material we have. We made sure that we had used the speed of evolution, which is specific for the viral types we analyse and for the viral genome, which we studied.

Q: When did the viruses get into the children’s bodies, according to your study?

Oliver Pybus: We can’t say when the virus got into each child. But we can say that the outbreak was before March 1998. I mean the whole outbreak, not the infection of each child.

Q: What time, before 1998, were the children infected?

Oliver Pybus: It depends on the virus, we study, and the method of analysis, which we use. In order to make sure that the results are clear, we used a wide range of methods of analyses. We found out that whatever method we used the common source existed before March 1998. It seems that the dissemination of Hepatitis C started shortly before the HIV epidemics. It probably happened because of a non-sterile hypodermic needle. The virus of Hepatitis C is much more easily transmitted through injections than the HIV virus. That’s why, we suppose that the Hepatitis C epidemics broke out before the HIV epidemics.

Q: Do you expect the Libyan court to accept the results of your analysis?

Oliver Pybus: I have no idea. I am not a lawyer and I don’t understand the legal procedures very well. Sometimes I think that lawyers also don’t understand the scientific procedures very well.

Q: Why wasn’t your method used before?

Oliver Pybus: We received the data base only now. Our group of researchers have specialized in such type of analysis for 10 years. However, the data was received recently and only now we realized that such type of analysis can be used exactly in this case. We received the data at the end of October. Before that we could not make analyses. We worked hard in order to be ready on time, before the verdict is pronounced.
New scientific evidence in Libyan HIV court case
06 Dec 2006 18:00:09 GMT
Source: Reuters

By Patricia Reaney

LONDON, Dec 6 (Reuters) - Scientists have produced new evidence that casts doubts on charges against five Bulgarian nurses and a Palestinian doctor accused of deliberately infecting 426 Libyan children with HIV in 1998.

The trial of the six health workers ended in Tripoli last month. The prosecutor demanded the death penalty after five Libyan HIV/AIDS experts stood by their 61-page report written in 2003 that found the infections resulted from an intentional act.

A Libyan court is expected to deliver a verdict on Dec. 19.

But a team of international scientists who reconstructed the history of the virus from samples from the children have shown the subtype of HIV began infecting patients at the Al-Fateh Hospital in Benghazi before the foreign medical team arrived.

"The evidence shows the chain of infection started a few years before the arrival of the foreign staff accused of causing it deliberately," Dr Tulio de Oliveira, a molecular virologist at Oxford University in England, said in an interview.

The scientists, whose findings are published online by the journal Nature, analysed the genetic code of HIV and Hepatitis C viruses from the children to determine when the outbreaks started. They did an extensive analysis using 20 different models.

"All of them give a date for the start of the epidemic around the mid-1990s," said De Oliveira.

He added that a team of 10 specialists from around the world who reviewed the research think the results are "extremely solid."

The six medical workers, who have protested their innocence and said their confessions had been made under torture, arrived in Libya in March 1998. They have been in detention since 1999.

INDEPENDENT SCIENTIFIC ASSESSMENT

De Oliveira and his colleagues in Oxford collaborated with scientists from several European universities to conduct an independent scientific assessment of the data. Their findings are expected to be presented to the Libyan authorities.

The medical workers were sentenced to death by firing squad after being convicted in a trial in 2004. The verdict was quashed last year by the supreme court and the case was sent to a lower court.

Earlier scientific evidence provided by Luc Montagnier, a co-discoverer of the virus that causes AIDS, concluded the infection at the hospital resulted from poor hygiene and the reuse of syringes and had also begun before 1998.

"All the lines of scientific evidence point in the same direction, towards a long standing infection control problem at the hospital, dating back to the mid 1990s or earlier," Dr Oliver Pybus, of Oxford University and a co-author of the Nature report, said in a statement.

The United States, which is in the process of restoring full diplomatic ties with Libya after decades of hostility, backs Bulgaria and the European Union in saying the medical workers are innocent.

Libya has been under pressure to hear independent scientific evidence about the case. International experts have criticised the scientific report used in the trial.

In an open letter to Libyan leader Muammar Gaddafi published last month in Nature, more than 100 Nobel Laureates in the sciences called for a fair trial for the medics.

"A miscarriage of justice will take place without proper consideration of scientific evidence. We urge the appropriate authorities to take the necessary steps to
permit such evidence to be used in this case," the Nobel winners wrote in the letter.

Lawyers representing the families of the infected children have requested compensation of 15 million Libyan dinars ($11.6 million) for each infected child, which would lead to a total bill of about $4.6 billion.
The last-ditch bid to save the Tripoli Six

JAMES MORGAN

IN less than a fortnight, the Tripoli Six will learn if they are to be executed. The medics – five Bulgarian nurses and a Palestinian doctor – have been imprisoned in Libya for seven years, facing the death sentence, for a crime they say they did not commit.

In 1999, they were accused of deliberately infecting 426 Libyan children in hospital with HIV, in collaboration with the CIA. Their "confessions" were extracted after a period of torture which included, say eyewitnesses, beatings with wire, electric shocks and the use of dogs. Ever since, they have protested their innocence, backed by an international coalition of medics, virologists, politicians and human-rights groups.

At their trial, one of the world's greatest experts on HIV, Dr Luc Montagnier, testified that the real cause of the infections was poor hygienic practices at the hospital. Records suggest the outbreak began before the medics arrived, and continued to spread after they were thrown in jail. And almost half the HIV-infected children were also infected with hepatitis B or C, which again suggests poor hygienic practice. But Montagnier's evidence was thrown out by the courts, and in 2004 the six were sentenced to death by firing squad.

After an international outcry, a retrial was granted by the Libyan Supreme Court. This trial ended recently, with defence lawyers still fearing the worst.

In desperation, human rights organisations launched a last-ditch appeal to scientists around the world to find definitive evidence that would exonerate the group. Today, with just 12 days until the verdict, that call has been answered – thanks, largely, to the ingenuity of an Edinburgh scientist.

Dr Andrew Rambaut had only just arrived in his new office at the Institute of Evolutionary Biology in October when the telephone rang. It was Professor Tulio de Oliveira, Rambaut's former colleague at Oxford University, who had been asked to head up a coalition of international experts to provide the missing evidence: the precise date of the HIV outbreak in the Libyan hospital, a secret hidden within the DNA of the virus itself.

A group of Italian scientists had gained access to new blood samples collected from the HIV-infected children. They needed a powerful, sophisticated computer program that could find the clues in the virus and interpret them – and such a program had already been written by Rambaut. "It's fair to say it was urgent," says Rambaut. "It went right to the top of my list."

He set out to date the outbreak using a technique similar to that used by taxonomists to date the evolution of a species. His program began comparing HIV samples taken from 51 of the 426 children. Each child had a slightly different lineage of virus, but each lineage had evolved from a common ancestor – a single strain of virus with a single DNA sequence.

Over two fraught weeks, the program was able to determine the original virus sequence, and reconstruct the exact phylogeny, or family tree, of the outbreak. Each new branch in such a tree is due to a mutation – a tiny change in the virus DNA sequence as the virus transmits from person to person.

Now, here comes the clever part. The rate of these mutations is almost constant – so regular that you can mark time by it. Thus, by beginning at the children's HIV sequences and travelling backwards through the branches, the computer was able to count the mutations and thus determine the length of time that had passed since the first infection in the hospital.

It showed that the strain of HIV with which the children had been infected was a West African subtype, which had clearly been present and spreading locally in the mid-1990s, long before the medics arrived. If the "molecular clock" was stopped on the day they arrived, in March 1998, it would show that the original virus had already branched into many, many different viruses – a sign that it had already been transmitted many times between people within the hospital.

The findings, published today in the journal Nature, provide independent genetic confirmation of Montagnier's testimony. The journal's editors have fast-tracked publication to make this new evidence available before the verdict – but whether that will be enough to save the Tripoli Six from the firing squad is a question no computer program can answer.

"It's not my place to comment on the outcome of the case," says Rambaut. "But I'm hopeful that something will come of this."

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Medics await their fate in Libyan HIV case

By Peter Popham

Published: 18 December 2006

A Palestinian doctor and five Bulgarian nurses will learn tomorrow whether they must die by firing squad for deliberately infecting more than 400 Libyan children with HIV.

Fifty-two of the children have since died of Aids. The surviving 374 are being treated at hospitals in France and Italy, at the expense of the Libyan leader, Colonel Muammar Gaddafi. Ramadan Faitori, a spokesman for the childrens' families, said, "We are confident that the accused group is criminal and will be convicted."

The foreign medical staff were first convicted of the crime and sentenced to die in 2004, but Libya's Supreme Court ordered a retrial. Official media in Libya are declaring that the guilt of the accused is a foregone conclusion. They have been held in jail in Libya since March 1999.

The case has become a focus of tension between Libya and the West, where experts are united in believing that the six have been made scapegoats for a crime they did not commit. Reports by top Aids experts, including one by Professor Luc Montagnier, one of the discoverers of Aids, have exonerated them. Professor Montagnier said the epidemic was probably caused by poor hygiene in the hospital, and pointed out that it had begun before the six started working there, and continued after their arrest.

A report published last week in Nature by a team led by the British evolutionary biologist Oliver Pybus, who studied Libyan children under treatment at Bambinu Gesu Hospital in Rome, also concluded that the epidemic began before the foreign staff arrived. The report identified a likely source of the scourge. "The virus is of a kind found in west Africa," Dr Pybus wrote, "which makes sense as Libya has a large population of guest workers from there."

The long-running and emotional case threatens to harm Libya's relations with the West. In 2003 Col Gaddafi renounced his programmes for nuclear and other weapons of mass destruction. Libya has since resumed full diplomatic relations with Britain and the US, and Col Gaddafi has been received with honour by the leaders of the European Union. But the trial has become a test case of Libya's ability and willingness to become a trustworthy partner.

It has also become a political headache for Col Gaddafi as the city of Benghazi, where the contamination of blood supplies took place, is a hotbed of opposition to his authoritarian rule. The case against the foreigners appears to have become a surrogate way of expressing hostility to the Gaddafi regime.

Earlier this year, Libya offered a way out of the fix: Bulgaria should pay the children's families $2.7bn, the same amount paid by Libya in compensation for the Lockerbie bomb. Sofia rejected the proposal.

The six medics have claimed that they were tortured in custody, but Libyan police and a doctor who they blamed for the attacks were acquitted in trials that finished last year.

David Welch, the US Assistant Secretary of State who helped negotiate the resumption of diplomatic relations between Libya and America, arrived in Tripoli on Friday to discuss "issues which hinder improvements in relations". No details were released.
Mr Welch has previously called for the nurses to be allowed to go home.

Of the five nurses, the health of Snezhana Dimitrova is reported to be the most fragile. Formerly a nurse in Sofia, she suffered a nervous breakdown in 2005 and broke her leg in the autumn. She maintains it is inconceivable that a nurse and a mother could commit the crime of which she is accused.

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Pain-Related Gene

The discovery of a rare gene mutation that results in a complete inability to sense pain could lead to the development of novel painkillers, according to new findings (Cox J et al. Nature. 2006; 444:894-898).

Researchers in the United Kingdom, Pakistan, the United Arab Emirates, and Jordan studied 3 related families originating in northern Pakistan after learning of one family member, a boy who performed street theater by walking on burning coals and piercing his arms with knives. Although they were unable to examine the boy, who died on his 14th birthday after jumping off a roof, they turned up 6 related members from the boy’s clan, aged 6 to 14 years, who also had never felt any pain. The affected individuals had no apparent deficits in other sensory functions.

A DNA analysis revealed that the 6 youngsters shared a mutation in a gene called SCN9A, which is strongly expressed in pain-responsive neurons and encodes a sodium-channel protein that is crucial to transmitting the pain sensation detected by these neurons. “These findings should stimulate the search for novel analgesics that selectively target this sodium channel subunit,” the researchers noted.

Libya Sentences Health Workers

A Palestinian physician and 5 Bulgarian nurses accused of deliberately infecting more than 400 Libyan children with HIV were sentenced to death by a Libyan court on December 19, despite evidence from an international team of scientists demonstrating that the medical workers were not to blame for the infections (de Oliveira T et al. Nature. 2006; 444:836-837).

After analyzing genetic sequences of HIV and hepatitis C viruses isolated from some of the children to reconstruct the transmission history of the strains and determine when the outbreaks started, researchers from the United Kingdom and Italy were able to demonstrate that the strains of HIV found in the children were already circulating at the hospital and in the surrounding area in the mid-1990s, well before the medical workers’ arrival in Libya in 1998.

In a trial in Kenya involving 2784 HIV-negative men, 47 uncircumcised men became infected compared with 22 among the circumcised men, a 53% reduction. In a trial in Uganda involving 4996 HIV-negative men, 43 uncircumcised men acquired HIV compared with 22 among the circumcised men, a 48% reduction.

Health experts emphasized that circumcision should not replace other prevention strategies. “This must not reduce our emphasis on other preventive interventions, behavioral interventions, regular and consistent use of condoms,” said Kevin De Cock, MD, director of the World Health Organization’s (WHO’s) department of HIV/AIDS at a telebriefing.

The WHO and other United Nations agencies planned to convene a meeting early this year to “view these findings more broadly and discuss their implications,” De Cock said.

European Law Targets Chemicals

The European Union (EU) passed sweeping environmental regulations last month that are intended to control the use of toxic chemicals by industry (http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm).

The new law, called the Registration, Evaluation and Authorisation of Chemicals (REACH), will require companies that manufacture or import about 30,000 chemicals in quantities greater than 1 ton per year to register these substances and provide basic hazard and risk information to a new European Chemicals Agency, based in Finland. The Agency will evaluate this information and determine if action, such as banning or restricting the use of a chemical, is needed. The regulation also calls for identifying safer alternatives to chemicals that pose the highest risks to human health.

The EU will begin to implement REACH in June, a gradual process that will take about 11 years to complete. —Joan Stephenson, PhD
Glaucoma Clues

Research by scientists in England and Italy suggest that amyloid beta protein, the major constituent of the brain plaques that are a hallmark of Alzheimer disease, might also be responsible for retinal cell death in patients with glaucoma (Guo L et al. Proc Natl Acad Sci U S A. 2007;104[33]:13444-13449).

Using a rat model of glaucoma, the researchers found that amyloid beta accumulates in dying retinal ganglion cells and that adding this protein to retinal cells in vivo induced cell death. They also found that giving the animals agents that inhibit the formation and accumulation of amyloid beta reduced death of retinal ganglion cells, especially when given in combination.

Although current glaucoma therapy is aimed at lowering intraocular pressure, the disease can persist even when pressure-lowering medications are given or when pressure in the eye is normal. “Our work suggests that targeting the [amyloid beta] pathway provides a therapeutic avenue in glaucoma management,” the researchers said.

Marburg Virus Linked to Bats


Although Marburg virus was discovered in 1967, the natural reservoir for this deadly virus has been a mystery. However, the possibility that bats might harbor the infection was raised by such findings as the discovery of a related filovirus (Ebola virus) in fruit bats in Gabon and the Democratic Republic of Congo and epidemiological evidence linking cases of Marburg hemorrhagic fever during a large outbreak in 2000 to a gold mine inhabited by large numbers of bats.

Bats are currently suspected of being the source of 2 cases of Marburg hemorrhagic fever in July, diagnosed in 2 miners working in a lead and gold mine in Uganda.

The researchers tested members of 10 bat species found at 5 sites in Gabon and northwestern Congo. Of the 1268 JAMA, September 19, 2007—Vol 298, No. 11 (Reprinted) World Health Organization’s world health report for 2007 (A Safer Future: Global Public Health Security in the 21st Century, available online at http://who.int/whr/2007/en/index.html). Of particular concern are new diseases, which are emerging at the “unprecedented rate” of about 1 per year in the last 4 decades, as well as older infectious disease threats, such as pandemic influenza and tuberculosis.

The report outlines key recommendations, including such measures as global cooperation in surveillance and outbreak alert and response; open sharing of knowledge, technologies, and materials such as viruses and other laboratory samples; and increased global and national resources for training, surveillance, laboratory capacity, response networks, and prevention campaigns.

Libya Frees Health Workers

A Palestinian physician and 5 Bulgarian nurses who, despite scientific evidence to the contrary, were convicted of deliberately infecting more than 400 Libyan children with HIV were freed on July 24 after more than 8 years in prison. Their release was brought about by international pressure and negotiations between the European Union and the Libyan government.

After their release, the health workers were flown to Bulgaria, where they were immediately pardoned by Bulgarian President Georgi Parvanov.

Scientists from the United Kingdom and Italy had demonstrated that the strains of HIV found in the children were already circulating at the hospital and in the area in the mid-1990s, before the medical workers’ arrival in Libya in 1998 (de Oliveira T et al. Nature. 2006;444[7121]:836-837). Previous evidence indicated that the outbreak was caused by poor hospital hygiene; many of the children with HIV were also infected with hepatitis B or C, a sign that unsafe practices were common at the hospital. —Joan Stephenson, PhD