

# A FATAL CASE OF LASSA FEVER IN LONDON, JANUARY 2009

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In January 2009, the eleventh\* case of Lassa fever imported to the United Kingdom was diagnosed in London. Risk assessment of 328 healthcare contacts with potential direct exposure to Lassa virus - through contact with the case or exposure to bodily fluids - was undertaken. No contacts were assessed to be at high risk of infection and no secondary clinical cases identified.

### Background

Lassa fever is an acute viral haemorrhagic fever (VHF) caused by Lassa virus, a member of the Arenavirus family. It is a zoonosis acquired from the multimammate rat (*Mastomys* species), which sheds the virus in its urine and droppings. The disease is endemic in many West African countries.

Person-to-person transmission of Lassa fever occurs once symptoms have developed or in the period of convalescence, and then only through direct contact with infected bodily fluids such as blood, urine, faeces, saliva or semen. The incubation period for Lassa fever is usually 7-10 days, although a range of 3-21 days has been reported. Approximately 15-20% of people hospitalised with Lassa fever will die, but overall only about 1% of infections result in death [1, 2].

While Lassa fever does not pose a significant public health risk in Europe [3], occasional travel-associated cases do occur. To date, all imported infections to the United Kingdom (UK) - ten cases between 1971 and 2003, with one fatality in 2000 - have derived from either Sierra Leone or Nigeria. None of these have resulted in further clinical cases in health staff or other contacts [1].

### The incident

On 8 January 2009, a 66-year-old man was admitted to the Homerton University Hospital (HUH) in London with symptoms of fever, diarrhoea and confusion.

He had travelled on a flight from Abuja in Nigeria (where he had travelled south to Anambra state) to London on 6 January. He experienced fever, malaise, loss of appetite, and abdominal pain during the flight. He travelled from Heathrow airport by public

transport to his home in east London, and was described by a neighbour as being confused and feverish on arrival.

On 8 January, he was taken to HUH by ambulance, where he presented with a three-day history of fever, rigors, lethargy and mild diarrhoea. During his hospital stay, he was initially cared for in two open wards. He attended the radiology department on six occasions and an operating theatre once for lumbar puncture. Tests for a range of travel-associated infections (e.g. malaria, leptospirosis, dengue, yellow fever) were negative, and the case was managed in isolation at HUH as a possible typhoid case from 16 January. He was incontinent of urine and faeces at this time.

On 22 January, he was transferred to the Infectious Diseases Unit (Hospital for Tropical Diseases), University College Hospital, for further management, and on the same evening to the high-security infectious diseases unit (HSIDU), at the Royal Free Hospital, in a category 3 ambulance. The North East and North Central London (NENCL) Health Protection Unit (HPU) were alerted to the incident at this time.

A diagnosis of Lassa fever was confirmed by RT-PCR on 23 January, by the Novel and Dangerous Pathogens Laboratory (NaDP) laboratory at the Health Protection Agency (HPA) Centre for Emergency Preparedness and Response (CEPR), Porton Down. Lassa virus IgG antibodies were also detected in serum, and Lassa virus was subsequently isolated from blood and urine specimens.

The patient was commenced on ribavirin, and remained in isolation for the duration of his admission. He improved initially, but had a degree of nerve deafness - a feature consistent with Lassa fever [2,4]. Despite intensive nursing and medical care, the patient died on 29 January from complications exacerbated by pre-existing medical conditions. No post-mortem examination was undertaken.

### Communication with agencies and the media

A series of immediate actions were implemented by an Incident Control Team (ICT). The incident was reported to the World Health Organization (WHO) under the International Health Regulations and followed up with the Federal Ministry of Health, Nigeria through the

WHO Country Office. The European Centre for Disease Prevention and Control (ECDC) was also notified.

A HPA press release was issued, confirming that there was no risk to the general public resulting from the case [5]. Information was cascaded to all general practitioners in the area (via the Primary Care Trust), to NHS Direct, and to all Emergency Departments in London. The incident was subsequently reported in national and local (online and print) media.

### Risk assessment

All individuals with potential direct exposure to Lassa virus through contact with the case or exposure to bodily fluids required risk assessment. These contacts fell into a number of different professional and geographical groups:

- Other passengers on the flight
- The neighbour of the patient
- Ambulance staff involved in transporting the patient
- Medical, nursing and allied health professionals at the three hospitals

- Pathology staff handling specimens in several laboratories
- Radiology staff at HUH
- Domestic staff and porters at HUH

Each contact's risk of infection was assessed, and assigned into one of three categories (Table 1). Factsheets were produced on Lassa fever and the monitoring process (including advice for contacts going on holiday) according to risk category. These were available for dissemination to all contacts, most of whom were at HUH. The general factsheet (Category 1) was disseminated to HUH staff via the hospital intranet on 23 - 24 January.

From 23 January onward, members of staff were contacted either in person (at the hospital) or by telephone, asked about their contact with the patient, assigned to a category according to level of risk, and advised according to assigned category. No restriction was placed on work or movement for asymptomatic adults in any of the risk categories. A designated senior nurse was available 24 hours per day at the HUH to answer any queries.

TABLE 1

### Level of risk related to exposure to a patient with Lassa fever, and action, by category

Risk Category	Description	Action
No risk (Category 1)	No contact with the case Casual contact (e.g. sharing a room with the case, without direct contact with a potentially infectious material)	Inform of absence of risk Give Category 1 (general) factsheet
Low risk (Category 2)	Close direct contact with the case (e.g. routine medical/nursing care, handling of clinical/laboratory specimens), but did not handle body fluids or wore personal protective equipment (PPE) appropriately	Self-monitor* for fever and other symptoms compatible with Lassa fever Report to the senior nurse if temperature $\geq 38^{\circ}\text{C}$ , with further evaluation as necessary Give Category 2 factsheet
High risk** (Category 3)	Unprotected exposure of skin or mucous membranes (e.g. mucosal exposure to splashes, needlestick injury) to potentially infectious blood or body fluids, or unprotected handling of clinical/laboratory specimens	Record own temperature daily* and report this temperature to the senior nurse by 12 noon each day, with further evaluation as necessary Give Category 3 factsheet

\* Contacts to be monitored for 21 days from last possible exposure to case

\*\* Within this group, consideration for ribavirin prophylaxis, if any extreme exposure e.g. percutaneous injury

TABLE 2

### Categorisation of contacts of a patient with Lassa fever at Homerton University Hospital, January 2009

Professional group	Risk category assigned				
	No risk (Category 1)	Low risk (Category 2)	High risk (Category 3)	Not contactable	Total
Medical	17	17	0	4	38
Nursing/ AHP <sup>1</sup>	49	71	0	16	136
Pathology	0	72	0	0	72
Domestic staff	12	0	0	5	17
Porters/ transport staff	32	4	0	3	39
Phlebotomy	4	8	0	2	14
Radiology/ other investigations	7	1	0	4	12
<b>Total</b>	<b>121</b>	<b>173</b>	<b>0</b>	<b>34</b>	<b>328</b>

<sup>1</sup>Allied Health Professionals

Since the airline reported that there was no record of passenger illness or seeking assistance on the flight, the risk to other passengers on the flight was deemed negligible. The ECDC independently assessed the risk to other passengers on the flight and also concluded the case did not pose a significant risk to the citizens of the European Union.

Laboratories holding clinical specimens were contacted and asked to safely destroy these or transfer them for further testing or destruction as appropriate. Risk assessment of laboratory staff was carried out and there were no incidents reported at any of the laboratories involved in handling specimens. The neighbour of the patient was assessed and considered to be at low risk.

The funeral director was advised regarding the infectious state of the deceased who had already been placed in a sealed metal-lined coffin. It was advised that the coffin remain sealed and no viewing of the body take place.

### Outcome of monitoring contacts

In total, 328 people at HUH were identified as possible contacts of the case. Thirty-four (10%) could not be contacted but attempts to do so are ongoing. The 21-day surveillance period (from date of last possible exposure) for HUH staff ends on 12 February.

To date, no contacts have reported any illness compatible with Lassa fever, and no high risk (Category 3) contacts have been identified (Table 2).

### Discussion and conclusion

The risk for human-to-human transmission of Lassa fever is low. However, healthcare-associated transmission has occurred in areas where Lassa fever is endemic [6], and an instance of asymptomatic seroconversion was reported in a German physician in 2000 [7].

Clinical diagnosis of Lassa fever is difficult, and it is often confused with other more common infections such as severe malaria or typhoid fever [1]. A range of travel-associated infections was requested in this case. However, the diagnosis was only established two weeks after admission. Such a delay is not uncommon in imported Lassa cases [8]. In persons arriving from Africa, clinical histories should include careful assessment of travel to regions where uncommon diseases are endemic [6], including Nigeria, Sierra Leone, Liberia and Guinea for Lassa fever [9]. Early suspicion and diagnosis are vital to the successful management of these patients.

While ribavirin has been shown to be effective in early-stage arenavirus infections, particularly Lassa virus [2], in the absence of proven effectiveness for prophylaxis [3], oral ribavirin was not recommended for persons who might have been exposed to the case described here. Current advice would suggest restricting its use to contacts at highest risk [3].

Meticulous adherence to appropriate infection control practices to prevent unprotected exposure to blood or other body fluids is essential for the safe management of patients with possible Lassa fever [6], and the prevention of onward transmission, particularly given the non-specific presentation of Lassa fever and related VHF syndromes. In this incident, it is commendable that, even without knowing the diagnosis and the risks they were exposed to, all healthcare and other workers at the HUH who had contact with the patient before confirmation of Lassa fever diagnosis had worn appropriate personal protective equipment (PPE), and thus we did not identify any Category 3 risk persons.

\* Authors correction

In the Abstract, the sentence "In January 2009, the seventh case of Lassa fever imported to the United Kingdom was diagnosed in London" was replaced by: "In January 2009, the eleventh case of Lassa fever imported to the United Kingdom was diagnosed in London". This was corrected on 13 March 2009.

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