Grippotyphosa, and Pomona and where serogroup Icterohaemorraghiae is not detectable (*2*). These findings contrast with human leptospirosis findings from La Réunion and the Seychelles, where the Icterohaemorraghiae serogroup is most common (*3*).

Our MAT-derived data cannot discriminate between recent and past *Leptospira* infections, nor can these data be used to determine the severity of the disease in the Union of the Comoros. Nonetheless, the data strongly support the presence of human leptospirosis on the 3 islands of the Union of the Comoros and emphasize the need for a proper diagnosis to ascertain the number of leptospirosis cases among the acute febrile illnesses in this country.

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Nosocomial Drug-Resistant Bacteremia in 2 Cohorts with Cryptococcal Meningitis, Africa

To the Editor: Cryptococcal meningitis is the second leading cause of AIDS-related deaths in Africa. The prolonged hospitalization necessary for optimal management may predispose severely immunocompromised persons to hospital-acquired infections. Limited data are available for sub-Saharan Africa regarding multidrug-resistant infections (*1,2*). We hypothesized that bacteremia was a major cause of death.

We reviewed bacteremia episodes in cryptococcal meningitis cohorts in Kampala, Uganda (n = 115 episodes) and Cape Town, South Africa (n = 72) during November 2010–April 2013. Data were obtained from the prospective cryptococcal optimal antiretroviral therapy timing trial (www.clinicaltrials.gov:NCT01075152), a randomized strategy trial assessing optimal antiretroviral therapy timing (n = 142) and another prospective observational cohort in Cape Town (n = 45).

We enrolled HIV-infected adults who had a first episode of cryptococcal meningitis diagnosed by cerebrospinal fluid culture or cryptococcal antigen testing. Standardized treatment was in accordance with World Health Organization (WHO) guidelines: amphotericin deoxycholate, 0.7–1.0 mg/kg/d for 14 days, and fluconazole, 800 mg/d, requiring a minimum 14-day hospitalization (*3*). Each person provided written informed consent. Institutional review board approval was obtained.

Blood cultures were obtained in accordance with physician discretion, typically with new onset fever (>38°C) unrelated to amphotericin. Two aerobic blood cultures were obtained from 1 peripheral site and not

from central catheters. BACTEC (Becton Dickinson, Franklin Lakes, NJ, USA) or BacT/ALERT (BioMérieux, Durham, NC, USA) bottles were incubated at 37°C in automated instruments for 5 days. Drugs were given empirically at physician discretion and adjusted after culture/susceptibility results were obtained.

Each bacteremic episode was classified as a true pathogen, contaminant, or indeterminate on the basis of clinical scenario and bacterial isolates. Data extraction from case report forms elicited demographics, microbiology results, antimicrobial drug therapy, and clinical outcomes. We determined risk factors between cases and controls who had cryptococcal meningitis without bacteremia/sepsis.

Descriptive statistical analysis reported median and interquartile range (IQR). Risk was expressed as odds ratio with 95% CIs calculated by logistic regression. Significance was defined as $p<0.05$ by Fischer exact test (SPSS 21; IBM, Armonk, NY, USA). Variables with $p<0.10$ by univariate analysis were entered in a multivariable model.

We evaluated 187 persons with cryptococcal meningitis who had a median CD4 count of 27 cells/μL (IQR 9–76). Forty-three blood cultures were prepared for 40 patients with febrile episode(s), of which 37 were positive. Median time from admission to suspected bacteremia was 14 days (IQR 9–17 days). All episodes were detected >72 h after admission and classified as nosocomial bacteremia. Seven isolates were considered contaminants because clinical improvement occurred without appropriate therapy. Thus, 30 cultures for 28 persons (cohort incidence 15%) were classified as true bacteremia with compatible clinical syndrome. Twenty-three bacteremic episodes occurred in Kampala (incidence 18%). Seven episodes occurred in 5 patients in Cape Town (incidence 7%).

The most frequent microbiologic etiologies were *Klebsiella pneumoniae* (9 episodes), *Staphylococcus aureus* (8), and *Pseudomonas* spp. (3) (Table). Methicillin-resistant *S. aureus* constituted 6 of 8 *S. aureus* isolates.

Ceftriaxone was the most common empiric drug used, for which 23 (77%) of 30 isolates were resistant. Eleven (46%) of 24 isolates were resistant to ciprofloxacin. Among bacteremic patients, 12 (43%) of 28 died within 30 days after hospitalization. The 30-day mortality rate

Table. Characteristics of 28 patients with cryptococcal meningitis, Uganda and South Africa, November 2010–April 2013*

Patient	Blood culture isolate	Hospital	30-d outcome	Ceftriaxone susceptibility†	Fluoroquinolone susceptibility†
1	*Staphylococcus aureus* (MRSA)	K	Died	R	NT
2	*S. aureus* (MRSA)	K	Survived	R	NT
3	*S.. aureus* (MRSA)	C	Survived	R	S
4	*S. aureus* (MRSA)	C	Survived	R	R
5	*S. aureus* (MRSA)	C	Died	R	S
6	*S. aureus* (MSSA)	K	Survived	S	NT
7	*S. aureus* (MSSA)	K	Survived	S	NT
8‡	*S. aureus* (MRSA)	C	Survived	R	R
8	*Enterobacter cloacae*	C	Survived	R	S
9	*Klebsiella pneumoniae*	K	Survived	R	R
10	*K. pneumoniae*	K	Died	R	R
11	*K. pneumoniae*	K	Survived	S	S
12	*K. pneumoniae*	K	Died	R	S
13	*K. pneumoniae*	K	Died	R	R
14	*K. pneumoniae*	K	Died	R	R
15	*K. pneumoniae*	K	Survived	R	R
16	*K. pneumoniae*	C	Survived	R	NT
17	*K. pneumoniae*	C	Died	R	S
18	*Pseudomonas putida*	K	Died	S	S
19	*Pseudomonas aeruginosa*	K	Survived	R	R
20	*Pseudomonas* spp.	K	Died	R	NT
21	*Salmonella* spp.	K	Survived	S	S
22	*Salmonella* spp.	K	Died	S	S
23	*Burkholderia cepacia*	K	Survived	R	NT
24	*B. cepacia*	K	Survived	S	S
25	*Citrobacter freundii*	K	Died	R	S
26	*Acinetobacter baumanii*	K	Survived	R	S
27	*Enterobacter* spp.	K	Died	R	R
28‡	*Enterobacter cloacae*	C	Survived	R	S
28	*Stenotrophomonas maltophilia*	C	Survived	R	R

*Sixteen (57%) of 28 patients survived; 7 (23%) of 30 isolates were susceptible to ceftriaxone, and 13 (54%) of 24 isolates were susceptible to fluoroquinolone. MSRA, methicillin-resistant *S aureus*; K, Kampala, Uganda; R, resistant; NT, not tested; C, Cape Town, South Africa; S, sensitive; MSSA, methicillin-sensitive *S. aureus*.

†Drug sensitivity testing performed by using the Kirby-Bauer method in Cape Town, South Africa, and a Phoenix Automated Microbiology System (Becton, Dickinson, Franklin Lakes, NJ, USA) in Kampala, Uganda.

‡Two patients each had 2 episodes of bacteremia.

for persons with cryptococcal meningitis but without bacteremia was 30% (47/158); 1 patient was lost to follow-up. Thus, the estimated attributable mortality rate for bacteremia was 13% (odds ratio 1.8, 95% CI 0.78–4.0, p = 0.17) compared with patients without bacteremia during their initial hospitalization.

Case–control comparisons identified no risk factors for bacteremia (online Technical Appendix, wwwnc.cdc.gov/EID/article/20/4/13-1277-Techapp1.pdf). Although 21 (70%) of 30 bacteremia episodes were preceded by phlebitis at a peripheral intravenous site, phlebitis caused by amphotericin was also common in patients without bacteremia (49%), but these percentages did not differ statistically.

Accurate data regarding incidence of nosocomial infections in Africa are lacking. A systematic review by WHO in 2011 that assessed published data for 1995–2009 identified only 2 high-quality studies. WHO estimated a prevalence of 2.5%–14.8% for nosocomial infections and a cumulative incidence of up to 45.8% in some areas (*4*) and recommended surveillance to estimate the rates of nosocomial infection. WHO acknowledges that health care–associated infections are causes of prolonged hospitalizations, increased antimicrobial drug resistance, financial burdens on health care systems, and causes of excess illness and death (*5*).

Limitations of our study include the retrospective design and inability to identify predictive risk factors for bacteremia. Given the differences in bacteremia incidence between our 2 sites, findings are probably not generalizable to all clinical settings in Africa. However, these findings identify a clinical problem.

The incidence of nosocomial bacteremia was 15% in our hospitalized cryptococcal meningitis cohort at a median time of 14 days after hospitalization. The most frequent etiologies were *S. aureus* and *K. pneumonia*. Less than 25% of isolates were sensitive to ceftriaxone, a standard empiric drug used throughout Africa. Further prospective studies are needed to determine the prevalence and risk factors for nosocomial infections and prevalence of multidrug resistance among hospitalized persons in resource-limited areas.

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Severe Babesiosis in Immunocompetent Man, Spain, 2011

To the Editor: Babesiosis, a malaria-like illness, is transmitted through *Ixodes* ticks by the zoonotic parasites, *Babesia* spp. In humans, these parasites are transferred from mammalian animal reservoirs, and the rate of infection in humans is increasing. Babesiosis also potentially threatens the blood supply because asymptomatic infections in humans are common; such infections can be life-threatening in some recipients (*1*). Most human infection is caused by *B. microti*, but babesiosis caused by *B. divergens*, *B. duncani*, and *B. venatorum* has been reported.

Human babesiosis can be clinically silent or progress to a fulminant malaria-like disease. The infection resolves spontaneously or after treatment with azithromycin/atovaquone or clindamycin/quinine. However, immunocompromised patients may respond suboptimally to these drug regimens (*2*). Given the death rate

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Nosocomial Drug-Resistant Bacteremia in 2 Cohorts with Cryptococcal Meningitis, Africa

Technical Appendix

Technical Appendix Table 1. Demographic data for persons with cryptococcal meningitis by nosocomial bacteremia status, Kampala, Uganda and Cape Town, South Africa*

Study site, baseline demographics	Without bacteremia	With bacteremia	Univariate p value
Kampala, Uganda			
No.	94	21	NA
Age, y	35 (30–40)	36 (31–43)	0.37
Male sex	43 (46)	15 (71)	0.052
CD4 count, cells/μL	16 (7–70)	17 (6–60)	0.71
HIV viral load, $\log_{10}$ copies/mL	5.4 (5.2–5.7)	5.6 (5.5–5.8)	0.024
Leukocytes x 10^9/L	3.6 (2.6–4.9)	4.2 (3.1–6.0)	0.27
Thrombophlebitis	14 (47)†	13 (62)	0.39
Deaths at 10 wk	34 (36)	11 (52)	0.22
Cape Town, South Africa			
No.	65	7	NA
Age, y	36 (28–43)	34 (23–42)	0.66
Male sex	35 (54)	5 (71)	0.45
CD4 count, cells/μL	61 (16–98)	14 (11–43)	0.028
HIV viral load, $\log_{10}$ copies/mL	5.1 (4.6–5.7)	5.4 (4.8–5.5)	0.80
Leukocytes x 10^9/L	5.0 (3.4–6.2)	3.5 (2.2–5.0)	0.11
Thrombophlebitis	20 (50)†	6 (85)	0.11
Deaths at 10 wk	22 (35)‡	2 (29)	0.99

*Values are median (interquartile range) or no. (%) unless otherwise indicated. NA, not applicable. p values were calculated for continuous variables by using the Mann-Whitney U and for categorical variables by using the Fisher exact test.
†Detailed chart extraction was performed for thrombophlebitis on 30 persons without bacteremia in Kampala (n = 30) and on 40 persons in in Cape Town matched within 1 mo of diagnosis of a case-patient with bacteremia.
‡Two persons were lost to follow-up.

Technical Appendix Table 2. Risk factors for bacteremia in a combined cohort with cryptococcal infections, Cape Town, South Africa, and Kampala, Uganda*

Baseline demographics	Without bacteremia, n = 159	With bacteremia, n = 28	Univariate p value	Adjusted odds ratio (95% CI)	Multivariate p value
Cape Town	65 (90)	7 (9.7)	NA	Referent	NA
Kampala	94 (82)	21 (18)	0.14	1.4 (0.53–3.8)	0.49
Age, y	36 (30–42)	36 (30–42)	0.60	ND	NA
Male sex	78 (49)	20 (71)	0.039	2.4 (0.98–5.9)	0.055
Weight, kg	54 (48–58)	59 (50–65)	0.14	ND	NA
Leukocyte x 10^9/L	3.9 (2.9–5.8)	4.0 (2.7–5.5)	0.89	ND	NA
CD4 count, cells/μL	30 (10–79)	17 (6–47)	0.082	0.90 (0.80–1.02)†	0.10
HIV viral load, $\log_{10}$ copies/mL	5.4 (5.0–5.7)	5.6 (5.4–5.7)	0.046	2.1 (0.76–5.7)	0.15
C-reactive protein at day 7, mg/L	93 (54–143)	126 (67–180)	0.17	ND	NA

*Values are no. (%) of median (interquartile range). NA, not applicable; ND, not determined. Univariate p values were calculated for continuous variables by using the Mann-Whitney U and for categorical variables by using the Fisher exact test. Adjusted odds ratios and multivariate p values were calculated by using logistic regression that included site and variables with p<0.10 by univariate analysis.
†Odds ratio for CD4 is per each 10 cell/μL CD4 increase.