MERS-CoV Antibodies in Humans, Africa, 2013–2014

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Dromedaries in Africa and elsewhere carry the Middle East respiratory syndrome coronavirus (MERS-CoV). To search for evidence of autochthonous MERS-CoV infection in humans, we tested archived serum from livestock handlers in Kenya for MERS-CoV antibodies. Serologic evidence of infection was confirmed for 2 persons sampled in 2013 and 2014.

Middle East respiratory syndrome coronavirus (MERS-CoV) infection causes severe respiratory illness in humans. Some cases have been sporadic, but others have been part of nosocomial outbreaks mainly on the Arabian Peninsula (*1*

the virus and human infections have been directly linked *2–4*). As of January 2016, at least

CoV infection have been documented (*5*). In a geographi-

population of Saudi Arabia, antibodies against MERS-CoV ≈ *6*).

Antibodies against MERS-CoV have also been detected in dromedaries in several countries in Africa (e.g.,

30 years ago (*7–10*

trade is conducted from Africa to the Arabian Peninsula (*11*

es from camels in Africa suggests an African origin of MERS-CoV (*9*,*10*).

evidence for autochthonous hu-

archived human serum samples collected from 1,122 live-

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The Study

survey conducted during 2013–2014 in 2 eastern counties

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6,*12*

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6). A total of 16

We subsequently tested all samples positive by rELI-

Health Organization (*6*,*13*). Of note, the MERS-CoV strain putatively circulating MERS-CoV strains from Africa. strains because the ability of human serum to neutralize

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Table. Seropositivity for Middle East respiratory syndrome coronavirus in samples from humans in Kenya, 2013–2014*

County	No. samples tested	No. (%) positive by rELISA	No. (%) positive by rELISA and with ≥50% plaque reduction at 1:20 dilution
Garissa	559	4 (0.72)	0
Tana River	563	12 (2.13)	2 (0.36)
Total	1,122	16 (1.43)	2 (0.18)

*rELISA, recombinant ELISA.

strain, does not differ (*14*).

50 90) plaque

6 50 end

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14). Of the 16

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50

90

samples negative by rELISA from persons originating from

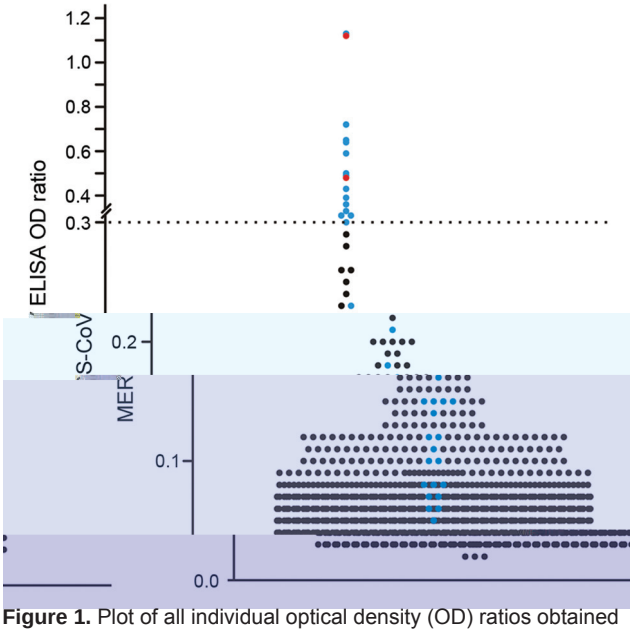

Figure 1. Plot of all individual optical density (OD) ratios obtained from recombinant ELISA testing of human serum samples for Middle East respiratory syndrome coronavirus (MERS-CoV) antibodies, Africa, 2013–2014. All 16 samples exceeding the cutoff of 0.3 and 22 other samples showing an OD ratio below the cutoff were subsequently tested in a plaque-reduction virus neutralization (PRNT) test; these samples are shown in blue, and the 2 samples positive by PRNT are shown in red. The horizontal dashed line represents the cutoff value as determined in a nationwide, cross-sectional serologic study in Saudi Arabia (*6*).

donkeys; the man kept goats and donkeys. Both persons

clinical symptoms, indicating that their MERS-CoV infec-

and that the infections may have been mild or subclinical. Because data about persistence of MERS-CoV antibodies after asymptomatic infection are not available, it can only

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quired. Neither the 2 MERS-CoV antibody–positive per-

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ies. Nevertheless, camels roam in both counties (*7*), and consume camel products.

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ommended by the World Health Organization for MERS-CoV diagnostics (*13*
larger studies that may enable direct virus detection.

Conclusions

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tions in Africa has triggered hypotheses regarding dif-

Arabian Peninsula and has raised doubts regarding the role of camels as a source of infection. Our study provides evidence for unrecorded human MERS-CoV infections in

found is comparable to previously reported proportions of unrecorded infections in the general population in Sau-

Arabia, respectively) (*6*

the discovery of unreported MERS cases requires testing

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ods (*6*

tested during the Saudi Arabia study, the proportion of se-

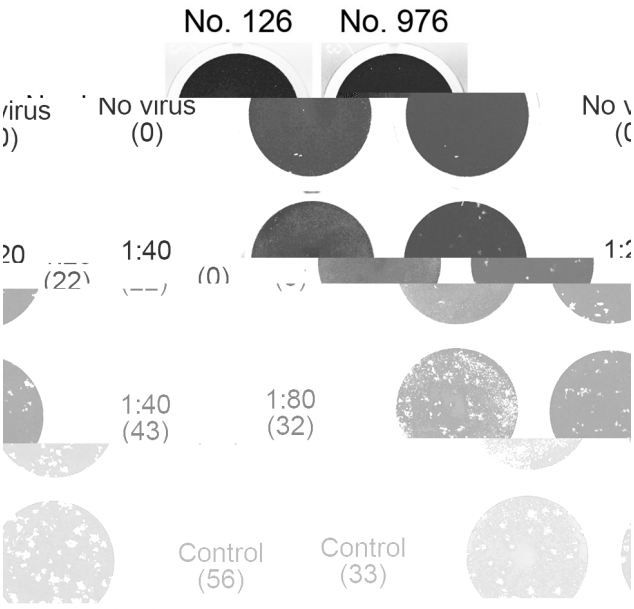

Figure 2. Middle East respiratory syndrome coronavirus (MERS-CoV) plaque-reduction neutralization test (PRNT) results for 2 serum samples positive by recombinant ELISA, showing virus neutralization activity against MERS-CoV strain EMC/2012 exceeding a titer of 1:10. Titers and number of plaques (in parenthesis) are shown next to the corresponding images. Sample no. 976 showed ≥50% plaque reduction up to a titer of 1:20, and sample no. 126 showed ≥90% plaque reduction up to a titer of 1:40. No serum was added to the control wells. Note that the image cannot represent the morphology and the contrast of plaques that was visible with direct inspection of cell culture plates with an appropriate light source, as was done for these experiments.

in parts of Africa could lead to underdiagnosis of clini-

Moreover, less accessible hospital care might preclude large nosocomial outbreaks as have been observed in

and reported clinical cases of MERS-CoV infection in Africa include lesser virulence of strains from Africa and cultural differences that might cause persons of different

On the basis of the ability of MERS-CoV to infect a *15*), it re-

might act as additional sources of human MERS-CoV infection. It is paramount to characterize MERS-CoVs from humans, camels, or tentative other animal hosts in Africa.

in pathogenicity and transmission potential, these MERS-

Middle East.

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progressive control of infectious diseases and the characterization of host–pathogen interactions.

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