TABLE 2
MATCHED ANALYSIS OF HIERARCHICAL ADL SELF-PERFORMANCE

ADL Hierarchy Level* for Case Residents	ADL Hierarchy Level* for Control Residents			
	0	1	2	3
0	†			
1		1†		1
2		2	4†	2
3		2	2	1†

Abbreviations: ADL, activities of daily living; CI_{95}, 95% confidence interval.
* ADL Hierarchy levels range from independent to very dependent, where "0" represents independent; "1," assistance required; "2," dependent; and "3," very dependent. Numbers represent pairs of case- and control-residents.
† The daggers represent similar ADL Hierarchy levels. There are six pairs represented below the daggers, demonstrating cases to have higher ADL Hierarchy levels (more dependent) than matched controls, and three pairs above, demonstrating less dependence. The odds ratio is therefore 6/3 or 2 (CI_{95}, 0.69-13.0).

dents, gloves had to be worn by staff providing personal care. For 2 residents in nursing home beds, gown and gloves were required for everyone entering their rooms.

Colonized residents scored a mean of 4.5 points more on the GDS (more depressed; P=.16) and had a mean of 4.3 points more in dysfunctional behavior burden scores (P=.8) than matched controls. Colonized individuals had lower MDS-HSI scores for all domains assessed and had a lower mean score (.10) than controls (P=.16). Residents who were colonized had more cognitive impairment (odds ratio, 3.0; 95% confidence interval, 0.65-10.4) and were more likely to be dependent (odds ratio, 2.0; 95% confidence interval, 0.69-13.0) than controls (Tables 1 and 2, respectively).

Our findings demonstrate a trend towards more depressive symptoms, dysfunctional behavior, dependency in activities of daily living, and lower health-related quality of life in residents colonized with multiresistant bacteria compared to noncolonized residents. The small sample size of our study is a limitation. Also, colonized residents had more comorbid conditions than controls, which may have confounded the relation between colonization status and quality-of-life scores. The findings may not apply to residents with VRE, since only one resident was colonized with this organism. Based on these findings, a prospective study of the impact of multiresistant bacteria on the quality of life in residents of LTCFs is warranted.

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Infection Control in Africa South of the Sahara

To the Editor:

The translation of US-style infection control practices into healthcare provision in Africa, especially for the extremely poor African countries, is not an easy program to envisage. Procedures that are standard practices in the United States may be practically impossible to implement in most African countries. This letter discusses some of the universal problems associated with infection control in the African context. There are also problems due to ignorance, poverty, and the resulting lack of even the most basic resources for health care. Solutions to some of these problems are suggested.

Africa south of the Sahara consists of several developing countries, some of which are the "poorest among the poor" (in the words of Dr. Kurt Waldheim).[1] These very poor countries include Chad, Guinea, Mali, and Sudan. Some African countries like Angola and Mozambique have been in the process of recovering from several years of devastating civil war, while others like the Sudan and Congo are still being ravaged by civil strife. The resulting unstable governments accentuate poverty.

The quality of health care in Africa south of the Sahara varies considerably between countries (and even within the same country). In large cities such as Lagos, Nigeria, and Nairobi, Kenya, there are modern well-equipped hospitals, whereas in the rural areas clinics are few and some have very poor facilities. In isolated rural communities, there may be no clinics at all, and the people have to depend on herbalists, traditional healers, and quack doctors or travel long distances to the cities for medical care.

Surveillance data on nosocomial infection from the region are few. In African countries, the nosocomial infection rate might be higher than the 5% to 10% reported from North American and Western European countries,[2] due to the poor facilities available in most hospitals. In most countries the extent of the problem is unknown; most hospitals do not have designated staff for infection control, and surveillance is not done routinely. Even in the few reported cases, it is difficult to compare rates of nosocomial infection since case definitions vary and surveillance is usually inadequate.

In the relatively few institutions that have infection control nurses, the nurses may not have had special training; they often are working as part-

time infection control nurses; and they may be too few in number in relation to the size of the hospital.

Pathogens that have been reported as causing nosocomial infections in these African countries are quite different from those in developed countries. They include bacteria such as *Salmonella*,[3] *Shigella, Vibrio, Mycobacterium,* and Lassa fever virus. In smaller hospitals there may be no microbiological laboratory support at all. Even where laboratories are available and functioning, investigation of infection is severely hampered due to lack of equipment, materials, and properly trained technicians.

Resistant strains of pathogenic species have been reported in most African countries.[4] Misuse of antimicrobial agents is very common in Africa; drugs are easily available over the counter or even in open-air markets. Even in hospitals, there may be inappropriate use of antimicrobials, especially for prophylaxis.

Another major problem is the attitude of hospital administrators to infection control. In an area of lack of resources, it may seem to administrators that providing the needed finances for infection control measures will increase costs. However, the relative lack of resources should not be used as an excuse for doing nothing. Fairly simple things, such as the regular provision of soap and running water, can lead to marked changes in hospital infection rates.

Antibiotic use in hospitals and in the community needs to be controlled. Laboratory support should be provided for surveillance of antibiotic resistance. In developing countries, pharmacists are placed uniquely to help control the use of drugs, since they have contact with patients.[5] They can be mobilized to serve as health promoters and educators, even though some of them create part of the problem by selling antibiotics without prescription.

It is now time for national action on infection control. Health ministers must set standards and enforce them by inspection at all levels of the health delivery system.

Surveillance of hospitals must be instituted so that the extent of the problem can be documented. Local surveillance reports could be used to create awareness of the extent of the problem at all levels of healthcare workers and also to convince hospital managers to allocate funds for control of hospital infection. If it is not possible to survey the whole healthcare facility, surveillance could be started in high-risk units.

The attitudes of administrators to hospital infection need to change. They must be given information about hospital infection so that they will be aware of the problems and see the value of allocating more resources for infection control.

If necessary, legislation must be passed that places the responsibility of safe care on hospital administrators.[6] Legislation also is needed for the management of infectious waste.

In the training of young doctors and nurses, all aspects of infection control must be stressed in the syllabus. In addition, continuous education for all healthcare personnel must be done regularly. Countries with more resources and international organizations such as the World Health Organization can help with training and development of research programs and appropriate local guidelines in developing countries.

Finally, healthcare workers must be protected while working with infectious patients and contaminated materials. Since measures used in industrialized countries to control diseases such as tuberculosis in the healthcare setting are beyond the resources of developing countries, healthcare workers must be protected by using methods involving practical measures relating to diagnosis and treatment of infectious cases, appropriate environmental control, and relevant personal protection and surveillance.[7]

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Rodac Plate Method to Recover VRE From Environmental Surfaces

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Hacek from the Northwestern Prevention EpiCenter, Northwestern Memorial Hospital and Northwestern University Medical School, Chicago, Illinois, compared the Rodac imprint technique to selective enrichment broth for detecting vancomycin-resistant enterococci (VRE) and multidrug-resistant *Enterobacteriaceae* (MDRE) on surfaces. Rodac plates contained tryptic soy agar with 5% sheep blood, vancomycin (6 µg/mL), ceftazidime (2 µg/mL), amphotericin B (2 µg/mL), and clindamycin (1 µg/mL). Two types of broth were used: brain heart infusion (BHI) and BHI plus vancomycin (6 µg/mL) and ceftazidime (2 µg/mL; BHIVC). Of the 46 surfaces cultured for VRE, 12 (26%) were positive. Of the 12 VRE-positive surfaces, 11 (92%) grew from Rodac, 8 (67%) grew from BHIVC, and 7 (58%) grew from BHI. A larger study is needed for MDRE, as only 4 of 43 surfaces were MDRE-positive. The Rodac imprint technique successfully recovered VRE from environmental surfaces.

FROM: Hacek DM, Trick WE, Collins SM, Noskin GA, Peterson LR. Comparison of the Rodac imprint method to selective enrichment broth for recovery of vancomycin-resistant enterococci and drug-resistant *Enterobacteriaceae* from environmental surfaces. *J Clin Microbiol* 2000;38:4646-4648.