

a simple reliable method for detecting anti-HCV antibodies in human serum that requires neither complex reagent preparation nor expensive instrumentation, could prove useful.

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### Immunization of Peacekeeping Forces<sup>1</sup>

**To the Editor:** The immunization status of military contingents arriving from different nations for peacekeeping missions may vary widely. This variation results from lack of information, coordination, and financial support.

For larger missions, the United Nations (UN)

Headquarters issues recommendations about needed vaccines; recently, operations officers have consulted World Health Organization experts before issuing recommendations, and their advice, which takes into account epidemiologic data in the host country, has improved. Medical officers who develop recommendations for smaller missions must consider the pathogenic agent; environment; host efficacy, safety, and price of preventive measures; and legal and ethical aspects.

Data on the incidence of vaccine-preventable diseases within a military population that had similar duties in the same location are rarely available. When data from the respective region are not available, disease incidence or prevalence in the host country may be substituted. These data, however, may be misleading since the military often does not have the same lifestyle as the native population. Plague, for instance, had an incidence rate of 8 per 100,000 in Namibia, but not a single case was reported in the South African Armed Forces (unpub. SAMS report: Disease Profile of South West Africa, 1989). If epidemiologic documentation for a host country is not available, data from neighboring countries may be useful.

Traveler's diarrhea is the most frequent health problem abroad (1,2). Although the diarrhea is self-limited and lasts an average of 1 day with appropriate treatment (4 days without), the unproductive time may be detrimental to a military mission. Oral vaccines against the three most frequent causes of traveler's diarrhea (enterotoxigenic *Escherichia coli*, *Campylobacter* spp., and rotavirus [1,2]) are being developed; the latter will be available soon (3). Hepatitis A, most frequent among the vaccine-preventable diseases (4), is 10 to 100 times more frequent than typhoid fever (4,5). Hepatitis B occurs mainly in expatriates, but infections have also been observed in tourists who have had unprotected casual sex (6). The incidence rate of rabies is unknown, but animal bites that may result in rabies virus transmission and thus necessitate postexposure prophylaxis are frequent (7). Only anecdotal cases of diphtheria, tetanus, and tuberculosis have been reported (8). Poliomyelitis, yellow fever, Japanese encephalitis, and plague occur only in limited parts of the world (5). The situation may rapidly change as

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epidemics occur (e.g., diphtheria in eastern Europe in the early and mid-1990s) (9). If needed, the World Health Organization can provide information on confirmed and unconfirmed epidemics on a weekly basis.

Travel and peacekeeping mission statistics share similarities. In Namibia, the South African Armed Forces had most often observed hepatitis (unspecified), with rare cases of tuberculosis, typhoid, and meningitis (unpub. SAMS report: Disease Profile of South West Africa, 1989), as did the UN mission to Namibia, where within 12 months and with 7,114 employees, seven cases of hepatitis (mostly hepatitis A, some unspecified) occurred (10). No other vaccine-preventable infections were diagnosed in this UN mission.

Considering both risk (on the basis of incidence rates) and impact of infection, the priority for immunization (from highest to lowest) is as follows: hepatitis A, hepatitis B, rabies, poliomyelitis, yellow fever, typhoid fever, influenza, diphtheria, tetanus, meningococcal disease, Japanese encephalitis, cholera, and measles. To administer all vaccines would be extremely costly and may also result in an increased rate of adverse side-effects. Immunizations against the more frequent, more severe infections should be given priority.

If a mission is limited to one season, environmental factors of that respective season should be considered. This general rule is more important for vector-borne than for vaccine-preventable infections, except for influenza and meningococcal disease.

Persons who are already immune (because of previous immunization or immunity after infection) need not be vaccinated. The latter cause is particularly often true of hepatitis A; troops recruited in developing countries have an anti-hepatitis A virus seroprevalence rate close to 100% (11). Hepatitis B immunization, except for non- and low-responders, probably grants lifelong protection (12); the same is likely for measles vaccine.

Sometimes the host country may require proof of some specific vaccination based on the International Health Regulations (13), currently under fundamental revision to become a more effective tool in preventing the spread of infections that may be a global hazard (14).

In addition to adequate epidemiologic information and coordination between the military, international health organizations, and

the host country, successful intervention efforts require thorough knowledge of vaccine characteristics with varying rates of efficacy and duration of protection. Cost-benefit evaluations, which would be very desirable, are unlikely in areas of political instability.

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### Sexually Transmitted Diseases in Ukraine

**To the Editor:** With the political changes in eastern Europe in the last 10 years have come social and economic changes (1). Ukraine not