tious diseases specialists in the United States. Although we do not believe physicians should abdicate their fundamental primary role in medical care just because times are changing, we welcome fresh ideas on how appropriately trained pharmacists can collaborate with infectious diseases specialists to improve patient care.

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Evaluation of Pertussis in U.S. Marine Corps Trainees

Sir—Jansen and colleagues [1] have demonstrated the potential role of Bordetella pertussis as a significant respiratory pathogen in U.S. Marine Corps trainees. The relevance of pertussis for military populations was illustrated by an epidemic in 1985 at Laughlin Air Force Base, Texas, which involved 299 suspected and 66 bacteriologically confirmed cases [2]. Sustained transmission of respiratory pathogens may be enhanced by the unique demographics of basic trainees. Although Jansen calls attention to the closed nature of the community, other factors may include a high turnover rate, providing a frequent influx of susceptible individuals. An example of this phenomenon is an outbreak of measles that occurred from 1976 to 1979 among the basic trainee population at Lackland Air Force Base. New groups of trainees (including potentially susceptible individuals) arrived weekly to complete a 6-week program. Cases occurred year round, without the usual seasonal pattern, with attack rates of ≈30 cases per 1,000 trainees per month. The outbreak was finally terminated by the routine immunization of trainees for measles upon arrival [3]. The epidemiology of the outbreak was described accurately by a stochastic model based on the Reed-Frost theory of epidemics, adapted as a Markov process [4].

The model was adapted to predict prospectively the behavior of pertussis in the same training population. Sensitivity analysis predicted sustained transmission under a wide range of susceptibility rates (14%–100%). To prevent sustained transmission, a vaccine would have to decrease the susceptibility rate to <10% within the first week of training. A vaccine boosting immunity after day 7 is predicted to reduce transmission by recruits leaving basic training, but not to prevent transmission among the new recruits arriving continuously [5]. The observation of Jansen et al. [1] that “none of the cases had discernible epidemiologic links” over 9 months suggests similar dynamics. The frequent influx of susceptibles as well as close confinement may constitute a unique and dynamic demography, placing training bases at increased risk for sustained transmission of respiratory disease.

References

The opinions expressed herein are those of the authors, and do not reflect official position or policy of the U.S. Army, the U.S. Air Force, or the U.S. Department of Defense.

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Reply

Sir—We would like to respond to the suggestion by Drs. Christopher, Pavlin, and Bustamante that acellular pertussis vaccines used in military populations would need to decrease the susceptibility rate to <10% within the first week of training in order to be valuable.

First, there is little published information that attempts to evaluate pertussis infection in adults in nonepidemic conditions. As described in our paper [1], the findings of these studies have not been consistent. Because of the difficulties in diagnosing pertussis, no study has definitively defined the incidence of disease. None, to our knowledge, has evaluated U.S. military populations.

Second, although the vaccine stochastic model [2] may be appropriate for the protection of U.S. Air Force recruits during 6 weeks of basic training, decisions regarding future use of acellular pertussis vaccines among U.S. military populations must be based upon longer periods. For instance, most of the military patients in our study [1] were U.S. Marines trainees who routinely undergo 5 months of crowded training. Throughout the training period, they are subject to respiratory disease epidemics including infections due to Bordetella pertussis [3–5]. In addition, military populations are at high risk for respiratory disease whenever they undergo deployment [6]. This was most recently evident during the Persian Gulf War, 1990–1991 [7, 8].

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