panel of experts, not derived from a specific data survey as in the COMPACCS study.

Second, assumptions used in previous studies have not stood the test of time. One essential assumption for studies in the early 1990s was that almost 100% of patients would have their care delivered by HMOs or other models of managed care. This hasn’t happened. While penetration of managed care is high in urban areas, many other areas have a low penetration of managed care. Fee-for-service care still exists, and it is growing in popularity again in many areas of the country.

The COMPACCS report is very important for multiple reasons. Not to be underestimated is the importance of the collaboration of the three societies to achieve a common goal. The memberships believe that their societies should work together in areas of common interest. This was done, and, hopefully, the success of this endeavor will provide the basis for future endeavors.

Manpower assessment studies clearly show the danger of “driving while looking through the rear view mirror.” By looking only backwards in our data and by failing to recognize the very dynamic nature of forces affecting patient demand and physician supply, we as a profession have embarked on policy initiatives that will be unsubstantiated in the future.

Is COMPACCS in danger of this same malady? You bet. Have things changed since the initial data collection 4 years ago? You bet. COMPACCS was always envisioned as a moving picture. Right now, all we have is a photograph of a single point in time. We need periodic evaluations using similar methodology to be able to rigorously defend our position and to make the most intelligent decisions regarding workforce and trainee planning.

The leaderships of the ACCP, the Society of Critical Care Medicine, and the American Thoracic Society have committed to revisit COMPACCS with a repeat survey. Efforts are currently underway to review the data survey methodology to update any areas. Specifically, the issues of hospitalists and pediatric intensivists are being explored.

Meanwhile, our professional societies must embark on strategies of physician workforce planning. Given this data, an intuitive conservative approach should include maintenance of the current supply of pulmonary and critical care physicians. Pulmonary and critical care trainee numbers should not be decreased. Multiple other strategies need to be considered and addressed.

The COMPACCS report has a wealth of data in addition to projections for the future. Characteristics of physician practice and work are delineated for pulmonary and critical care physicians. I urge you to read this report for yourself. Also, if you receive a COMPACCS survey in the future, please fill it out. Your responses are how we can best determine manpower and workplace issues.

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REFERENCES
3 Hunninghake GW, Mark JD, Rainey TG, et al. Workforce needs and training in pulmonary and/or critical care medicine. Am J Respir Crit Care Med 1995; 151:937–938
4 Angus DC, Kelley MA, Schmutz RJ, et al. Committee on Manpower for Pulmonary and Critical Care Societies: Current and projected workforce requirements for care of the critically ill and patients with pulmonary disease; can we meet the requirements of an aging population? JAMA 2000; 284: 2762–2770
5 Tarlov AR. Estimating physician workforce requirements; the devil is in the assumptions. JAMA 1995; 274:1558–1560

Lest the Tide Return

In 1992, Michael Iseman observed that: “As the epidemic tide of tuberculosis recedes from the shores of America, small tidepools of disease remain behind; pools populated by immigrants, the elderly, and the immunocompromised.”” The report by Narita and colleagues in this issue of CHEST (see page 343) gives us some insight into the impact of these tidepools on our society.

During the 43 months of their study (January 1, 1994, through July 31, 1997), 5,516 cases of active tuberculosis were identified in Florida, keeping it among the top six states in the United States reporting the highest annual rates of newly diagnosed tuberculosis cases. By law, Florida requires all laboratories to report positive cultures, thereby giving credence to the completeness of these data.

While this number of new tuberculosis cases initially appears large, in reality, when annualized against Florida’s total population of 14 to 14.5 million, the actual percentage of tuberculosis cases in
the population is stunningly low, ranging between 0.013% and 0.01%, a percentage that should hardly generate attention much less any significant concern. Simply stated, approximately one case of new active tuberculosis per 10,000 Floridians was detected during each year. Then why did CHEST determine that it was important to publish this report that focuses on an even smaller number of the cases, only 81 of the 5,516?

The answer is found in the “Results” section of the report by Narita et al. All 81 patients received diagnoses of multidrug-resistant (MDR) tuberculosis, which is defined as being resistant to both isoniazid and rifampin. Forty-three of these patients (53%) had accumulated their resistant organisms over a prolonged period of treatment. We tactfully define this as “acquired” resistance (ie, acquired through a combination of inadequate professional care and unpredictable patient behavior; the result, of course, being the selection and survival of resistant organisms that were allowed to progressively mutate and flourish over time).

Of more concern is the fact that 38 patients from this group (47%; nearly one half) had no history of prior treatment and developed their disease as a result of exposure to an individual with MDR pulmonary disease, again demonstrating that the old belief that drug-resistant organisms are not as contagious as fully sensitive tubercle bacilli was, and is, wrong.3

This becomes important in the light of our rediscovery of truths that over recent years have been replaced by myths, which unfortunately have acquired the legitimacy of facts through oft-repeated proclamations by authoritative sources. For example, physicians often are told that smear-negative tuberculosis patients are “not contagious,” a rationale based on the reality that these individuals expel fewer organisms than do smear-positive patients.

For those few persons unfamiliar with the definition of “smear-positive,” that determination is made after carefully examining 100 high-power microscopic fields over a 5- to 10-min period. If a single tubercle bacillus is identified, the patient’s sputum contains >10,000 bacilli/mL and is smear-positive. While smear-negative individuals do expel fewer bacilli, there has never been a factual basis to believe that they are not contagious. Behr et al4 have demonstrated quite convincingly that smear-negative patients are one fifth (20%) as infectious as smear-positive patients.

Similarly, many physicians have come to believe that extensive exposure is necessary to spread the disease. Again, this is not true. Transmission is dependent not only on the time of exposure, but is affected by sputum consistency, cough frequency, and, perhaps most importantly, the environment shared by the patient and contacts. In 1995, the Centers for Disease Control and Prevention5 reported transmission to eight students in <5 h of exposure.

When one considers that an adult tuberculosis patient has an average of 20 identifiable contacts plus those he or she exposes through casual contact, even this very small number of MDR patients becomes of vital importance to the community. It must be recalled that prior to the advent of chemotherapy, two thirds of those patients with active pulmonary tuberculosis were dead within a 5-year period. MDR tuberculosis reopens the possibility of a fearful return to that era, an apprehension that is validated by the authors’ findings that 32% of the 81 MDR patients died during treatment.

It is for this reason that the treatment results of this study are important. Despite a higher rate of social risk and HIV infection, the mortality rate of 18% in the hospitalized group was lower than the 26% mortality rate among patients treated on an outpatient basis in the community. Similarly, only 45% of the community group completed treatment despite the fact that outpatient treatment was ensured through the use of directly observed therapy. Seventy-nine percent of those admitted to the specialized inpatient tuberculosis treatment facility at Holley Hospital completed therapy. However, at what cost to society? Three to four days in a hospital can cost as much as a year of outpatient care, even when that care is directly administered. The average duration of inpatient care at Holley Hospital was 270 days at a cost that easily surpassed $150,000 per patient episode.

These are important findings for those involved in public policy development. MDR tuberculosis represents a failure of physicians, of public health officials, and of government. The message is clear: in the face of an escalating rate of MDR tuberculosis throughout the world and of the easy movement of diseased individuals between countries and continents, it is essential that the United States, always a country of immigrants, support and maintain its few remaining specialized centers of tuberculosis treatment and research.

It is equally important that all physician organizations, especially the American College of Chest Physicians, recognize that every physician becomes a public health official when encountering a tuberculosis patient and that every physician thereby assumes an obligation to ensure that treatment is thorough and complete. Unfortunately, a few academic centers continue to promulgate the belief that since everyone with tuberculosis desires to regain their health, everyone therefore will adhere to treatment if it is provided within a well-functioning health
system.6,7 Despite the presence of multiple studies that repeatedly have proven this assumption to be false and a world literature replete with reports of the success of directly observed therapy, these centers contend that there is no firm evidence demonstrating that directly observed therapy is both effective and essential in the treatment of tuberculosis.

It is time for physician organizations from all parts of the international community to reject such folly and firmly endorse directly observed therapy as the professional standard of care. And as a corollary standard, as soon as a patient is identified as not adhering to treatment appointments and cannot be induced to cooperate with directly observed therapy (even when provided with a range of social supports), public health officials should immediately direct that patient into a specialized tuberculosis treatment center. If we fully and appropriately treat all patients during their first encounter with tuberculosis, including the use of specialized facilities where necessary, the risk and the fear of MDR tuberculosis can fade into history.

The alternative is to stand by and watch as the tidepools described by Iseman slowly enlarge and perhaps return as a flood tide.

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REFERENCES
1 Iseman M. ASTER Challenge Lecture. Paper presented at: IUATLD meeting, November 1992; Paris, France

Smear-Negative Pulmonary Tuberculosis in Industrialized Countries

Much attention has recently been paid to the problem of smear-negative pulmonary tuberculosis. Quite appropriately, the discussion has focused on low-income countries, home to the vast majority of individuals with tuberculosis and HIV and where the ability to culture diagnostic specimens may be lacking.1–5 Yet, there remain legitimate questions concerning this group of patients in industrialized countries. In this issue of CHEST (see page 349), Kanaya et al address one of those questions. Is it possible to predict, among patients with suspected active, smear-negative pulmonary tuberculosis, those patients whose culture specimens will ultimately prove to be positive? The object would be to avoid the adverse consequences that might result from withholding treatment in patients with the disease (remaining ill for excessively long periods of time, and possibly infecting others in the community) or introducing treatment in patients without the disease (their actual illness goes untreated, and they are exposed unnecessarily to possible drug toxicity).

The problem of smear-negative pulmonary tuberculosis is not trivial. In acute-care settings, as many as 8 to 10 patients are suspected to have tuberculosis for every one confirmed case.6,7 In our provincial jurisdiction, respiratory specimens from 125 persons are submitted, on average, for every one culture-confirmed case of tuberculosis.

Presently the most important criteria for establishing a presumptive diagnosis of tuberculosis are the acid-fast bacilli (AFB) smear (performed on clinical specimens that are adequate in both quantity and quality) and a case definition, which may be based on radiographic signs, clinical findings, risk factors, or a combination of these factors.8 The sensitivity of the AFB smear result is known to be poor, varying between 30% and 70% depending on a number of factors relating to how the test is implemented.3 The sensitivity is improved by concentration of sputum specimens and use of fluorescent microscopy but reduced in patients with HIV disease.3,5 The specificity and positive predictive value of the smear results may be reduced in settings of high HIV prevalence or low (high nontuberculous mycobacterial [NTM]) tuberculosis prevalence.9 Yet, the sputum smear should always be performed because it is quick and easy to activate, provides preliminary confirmation of the diagnosis, and gives a quantitative estimate of the number of bacilli being excreted and therefore the infectivity of the patient (≥ 5,000 bacilli per milliliter of sputum must usually be