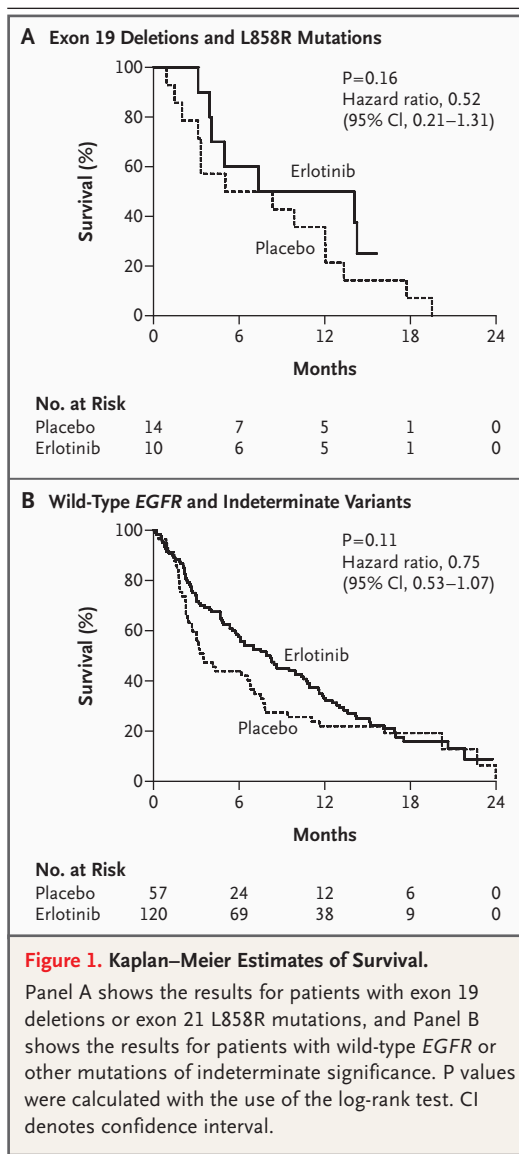


tions, we have reanalyzed our data, focusing only on exon 19 deletions and exon 21 L858R mutations for which the functional significance is clearer. Including the new samples, 24 cases that could be evaluated had these classic mutations, among 201 patients, for a prevalence rate of 11.9 percent, which is similar to mutation rates reported by other investigators. Among patients with classic mutations who were treated with erlotinib, the response rate was 30.0 percent (3 of 10 patients), as compared with 7.5 percent (8 of 106) for the remaining 106 patients ( $P=0.05$ ). The hazard ratio for death associated with erlotinib, as compared with placebo, was 0.52 (95 percent confidence interval, 0.21 to 1.31;  $P=0.16$ ) among those with classic mutations (Fig. 1A), whereas it was 0.75 (95 percent confidence interval, 0.53 to 1.07;  $P=0.11$ ) among those with wild-type *EGFR* or other variant mutations of indeterminate significance (Fig. 1B). The interaction  $P$  value for treatment by classic-mutation status was 0.45. These findings, although based on small numbers, are consistent with our previous results showing no significant difference in the survival benefit achieved with erlotinib between patients with classic mutations and patients with wild-type *EGFR*. We therefore continue to believe that testing for *EGFR* mutations is not necessary to identify patients for treatment with erlotinib, since patients with wild-type *EGFR* and those with mutant genotypes both have the potential to benefit from therapy.

Ming-Sound Tsao, M.D.  
Suzanne Kamel-Reid, Ph.D.  
Frances A. Shepherd, M.D.  
Princess Margaret Hospital  
Toronto, ON M5G 2M9, Canada



## The Metrics of the Physician Brain Drain

**TO THE EDITOR:** As African physicians who have experience in both the developing and the developed worlds, we believe that Mullan (Oct. 27 issue),<sup>1</sup> like others who have written about the metrics of the physician brain drain,<sup>2</sup> overlooks three important points. First, given the limited number of residency positions in the source countries, if the migrating physicians who are described in this article had stayed home, they might not

have attained the qualifications they now hold. This would have left a workforce of minimally trained doctors with even fewer jobs befitting their qualifications. Second, a reversal of the “fatal flows” of doctors from poor to rich countries, as touted by Chen and Boufford in the accompanying editorial,<sup>3</sup> would not necessarily lead to an effective increase in the number of practicing physicians, given the unequal geographic and so-

cioeconomic distribution of physicians within source countries. Anecdotally, we know many such physicians who, out of frustration, have left medicine altogether. These internal losses buttress our third point: the real effects of physician migration cannot be captured by static (stock-of-manpower) indicators.<sup>4</sup> We need to quantify the effects on flows and distribution of physicians within the source countries. These countries must actively contribute to crafting ethical and effective solutions. We hope that the World Health Report 2006 will encourage such developments.<sup>5</sup>

Uzor C. Ogbu, M.D.

Netherlands Institute of Health Sciences  
3000 DR Rotterdam, the Netherlands  
uzorco@yahoo.com

Onyebuchi A. Arah, M.D., Ph.D.

Academisch Medisch Centrum  
1100 DD Amsterdam, the Netherlands

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**TO THE EDITOR:** One of the major problems of being a physician or scientist in a developing country is the shortage of academic opportunities. Medical migration, or “brain drain,” from these developing countries is at least partially due to the potential risk of being deprived of such academic opportunities and losing scientific skills, which can lead to “scientific brain death.” Since the Internet provides rapid access to the scientific media, physicians from developing countries can now update their knowledge much more easily and have access to any scientific publication. An awareness of the amazing developments in their fields and a shortage of academic opportunities make emigration to a better scientific environment an attractive option for many physicians. “Brain drain” is widely considered as

one of the therapeutic options for the prevention of “scientific brain death.”

Gökmen Gemici, M.D.

Florence Nightingale Hospital  
80220 Istanbul, Turkey  
kardiyolog@ttnet.net.tr

**TO THE EDITOR:** Mullan joins Chaguturu and Vallabhaneni (Oct. 27 issue)<sup>1</sup> in raising timely issues for developing countries. A disheartening development in the Philippines is the increasing number of physicians who are retraining to become nurses. Most doctors there receive an annual salary equivalent to less than a month’s pay for a nurse in a U.S. hospital. Immigration to the United States for nurses is much simpler than it is for physicians. Since the year 2000, more than 3500 Filipino physicians have taken accelerated nursing courses and have left for nursing jobs abroad. More than 4000 physicians are now in nursing school. These students include not just new physicians but internists, surgeons, anesthesiologists, family practitioners, and subspecialists.<sup>2</sup>

On the basis of Mullan’s brain-drain formula and the actual number of Filipino physicians abroad, which is close to 22,000, the emigration factor for the Philippines increases to 19.4 percent. Widespread awareness of these issues is important because plugging the brain drain will require a multilateral approach involving not just source and recipient countries but a global effort for equitable health care.

Angela F. Domingo, M.D.

Edsel Maurice T. Salvana, M.D.

University Hospitals of Cleveland  
Cleveland, OH 44106  
angela.domingo@case.edu

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**TO THE EDITOR:** Mullan’s important report demonstrates that a nontrivial portion of the physician workforce has immigrated to richer nations from low-income countries. However, well-intentioned but misguided policies in source countries also contribute to such flows, and we should not

discount their importance. Many articles in the field of economics demonstrate that income differentials between source and recipient countries are the principal determinant of decisions regarding migration.<sup>1</sup> In many source countries, government clinics are the primary source of employment for physicians. Wages are not allowed to adjust to market levels, thereby exacerbating the pressure on physicians to emigrate. Moreover, many source countries provide enormous public subsidies to medical education, thereby contributing to the training of more physicians than there would be if tuition levels were higher. Finally, in contrast to the view of Chen and Boufford, physician migration is not necessarily a “fatal flow.” If physicians were not able to find work in high-income countries, evidence suggests that potential students might not continue to become physicians in their home countries.<sup>2,3</sup>

Amitabh Chandra, Ph.D.

Harvard University  
Cambridge, MA 02138  
amitabh\_chandra@harvard.edu

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**THE AUTHOR REPLIES:** Over the past half century, as global travel has become easier and the paths of medical credentialing have become more standardized, migration of physicians from poorer countries to wealthy Anglophone nations has become commonplace. Dr. Chandra and Dr. Gemici raise the important issue of the paucity of medical-training opportunities in low-resource nations as an acceptable rationale for medical migration from poor countries to rich ones. Although one can respect the desire to emigrate to obtain better opportunities, it is hard to make the case that

advanced training in medicine is either a “right” or good health policy. The desire of ambitious physicians to seek better practice and economic opportunities is understandable, but less defensible are the medical-education policies of Anglophone countries that fail to train a sufficient number of physicians to meet their own needs and then draw on the ambition of doctors educated elsewhere.

Dr. Chandra, as well as Drs. Ogbu and Arah, suggests that without the opportunity to move abroad in search of training, many physicians in low-resource countries might eschew the study of medicine. This premise illustrates another deleterious aspect of current large-scale emigration. The brain drain is actually a safety valve for systems in need of reform. It is a launchpad for some nations’ brightest young minds who, if they stayed at home, would demand change and probably lead that change. This perspective will not be well received by many migrating doctors, but if global calls for a reduction in poverty and an increase in health equity are to make any headway, these medical minds will have to be part of the solution, not the exodus.

The troubling report of Drs. Domingo and Salvana on the retraining of Filipino physicians as nurses in order to enter practice in the United States dramatizes the truly pernicious effect of the human-resource vacuum caused by the failure of the United States to train enough doctors or nurses for its own needs. Medical and nursing educators and policy leaders at both ends of the immigration road need to develop strategies to mitigate the brain drain. In the United States, this means, first and foremost, training toward the goal of self-sufficiency in the medical workforce.

Fitzhugh Mullan, M.D.

George Washington University  
School of Public Health and Health Services  
Washington, DC 20006  
fmullan@gwu.edu

## Health-Information Altruists

**TO THE EDITOR:** Project planners who are seeking to cultivate a network of patients willing to provide their health information to genomic-cohort investigators, as described by Kohane and Altman

(Nov. 10 issue),<sup>1</sup> cannot afford to ignore how increasing commercialization has complicated the social contract for biomedical research.<sup>2</sup> In fact, the very projects in Iceland and Estonia cited by