

Round Table

Strategies to discourage brain drain

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Abstract Building health research expertise in developing countries often requires personnel to receive training beyond national borders. For research funding agencies that sponsor this type of training, a major goal is to ensure that trainees return to their country of origin: attaining this objective requires the use of proactive strategies. The strategies described were developed under the extramural acquired immunodeficiency syndrome (AIDS) International Training and Research Program (AITRP) funded by the Fogarty International Center (FIC) at the National Institutes of Health, United States. This programme supports universities in the United States that provide research training to scientists from developing countries to enable them to address the global epidemic of human immunodeficiency virus (HIV)/AIDS and the related tuberculosis (TB) epidemic. This paper describes the strategies employed to discourage brain drain by the principle investigators (PIs) of five of the longest-funded AITRPs (funded for 15 years). Long-term trainees in these programmes spent from 11 to 96 months (an average of 26 months) studying. Using scientific, political and economic strategies that address brain drain issues, PIs working in AITRPs have attained an average rate of return home for their trainees of 80%.

Keywords Research personnel/supply and distribution; Brain drain; Emigration and Immigration; Biomedical research/education; Training support/organization and administration; Research support; Health priorities; HIV infections; Developing countries; Developed countries (*source: MeSH, NLM*).

Mots clés Personnel de recherche/ressources et distribution; Exode des compétences; Emigration et immigration; Recherche biomédicale/enseignement; Aide enseignement/organisation et administration; Priorités en santé; Infection à VIH; Pays en développement; Pays développé (*source: MeSH, INSERM*).

Palabras clave Investigadores/provisión y distribución; Exodo intelectual; Migración internacional; Investigación biomédica/educación; Apoyo a la formación profesional/organización y administración; Prioridades en salud; Infecciones por VIH; Países en desarrollo; Países desarrollados (*fuentes: DeCS, BIREME*).

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Introduction

Trained scientists are needed in every part of the world. However, the better standard of living and quality of life, higher salaries, access to advanced technology and more stable political conditions in developed countries often attract scientific talent from less developed areas. This phenomenon, known as the "brain drain", is not new. However, as scientists have increasingly recognized the importance of having capable partners worldwide, certain programmes have established strategies to stem the tide of migration of highly skilled people out of developing countries.

Given the borderless nature of disease and the international and interdisciplinary nature of current scientific research, international collaborations are key to addressing global health issues. Epidemics, such as those of severe acute respiratory syndrome (SARS) and acquired immunodeficiency syndrome (AIDS), highlight the need for qualified scientists throughout the world to signal problems and work together on producing solutions.

The issues surrounding brain drain are complex. For developing countries, scientific trainees who fail to return are a drain on the economy and on capacity building. On the other hand, expatriates send home money that they earn, thus contributing to the developing nation's economy. While abroad, they can contribute to scientific advances of importance to their home country and serve as mentors for other trainees.

A developed country may view itself as providing a refuge for those who would encounter political unrest and economic hardship at home. The developed world has its own shortages of skilled people in specific fields and can drain a developing country of expertise by providing job opportunities.

Some factors cited by researchers from developing countries as reasons for not returning after training include: lack of research funding, poor facilities, limited career structures, poor intellectual stimulation, threats of violence and lack of good education for children in their home country (1). However, not

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all the factors involved in brain drain can be addressed by science-funding agencies (e.g. research funding): some, such as violence, are outside their sphere of influence. Some strategies proposed to encourage trainees to return home, used by PIs of the AITRP funded by the Fogarty International Center (FIC) at the National Institutes of Health in the United States, are described below.

Strategies to address brain drain

Programmes supported by the FIC, which funds research training programmes for scientists from low- and middle-income countries with the goal of building local expertise to conduct research in developing countries, use a variety of strategies to encourage scientists to return home after training. One programme using these strategies is the AIDS International Training and Research Program (AITRP). The AITRP supports universities in the United States that provide research training to scientists from developing countries to enable them to address the global epidemic of HIV/AIDS and the related epidemic of TB. The FIC awards 5-year institutional training grants through the AITRP. Individuals from developing countries who wish to become trainees under the AITRP must apply directly to the PI in charge of an awarded grant, using the application process instituted by the PI. For the purposes of this study, long-term trainees were defined as trainees who were sponsored by an AITRP study for their master's degree or doctorate or held post-doctoral positions. The PIs of the AITRP must use strategies that encourage scientist-trainees to return home after training to accomplish an AITRP goal: this is to establish, in developing countries affected by HIV/AIDS and TB, the critical biomedical and behavioural science research expertise needed to address the global epidemic of HIV/AIDS and the related TB epidemic.

During the summer of 2002, the FIC conducted a survey of five of its longest-funded research training grantees under the AITRP. Each of these programmes had been funded for three, 5-year grant cycles (15 years). Given a list of 14 possible strategies, the PIs indicated which of these strategies they had used to make a trainee's return to his or her home country more probable. One or more PIs had used each of the strategies listed below; all PIs used a combination of strategies. Data from 186 long-term trainees on five AITRPs were used to calculate an average return rate of 80%. Trainees spent from 11 to 96 months training; an average of 26 months.

Scientific strategies

Research is responsive to priorities in the home country

An AITRP PI works with his or her colleagues in developing countries to determine their priority areas of research. By working in these high-priority areas, trainees in the programme are more likely to find support in their home country to continue working in the area in which they were trained.

Training-related research is conducted at home

By maximizing the amount of research training conducted in the home country, AITRP minimizes the time a trainee spends abroad. This is sometimes called "sandwich training" — the beginning and end of the training period take place in the host country institution whereas the middle third takes place at an institution in the home country. Carrying out the research at home, near family, friends and colleagues, places the trainee in a better position to find a job and funding after completion of the training.

Strategic in-country trainee selection

Collaborators and home-country institutions are involved in the training and selection process. In addition to selection criteria (such as test scores and proficiency in English) some PIs found trainees were more likely to return to their home countries if they were members of the institutions involved in the collaboration.

Strong mentoring in the United States and in the home country

Having a mentor both in the United States and in the home country is important. The mentor in the home country provides the necessary administrative, political and scientific support for a trainee. Ideally the mentor in the United States and the mentor in the home country will have a long-term scientific relationship that can provide research, training and scientific support.

Equipment support

The AITRP provides some funds for the purchase of computers and the laboratory equipment necessary to accomplish research goals. At sites where other research supported by the National Institutes of Health is conducted, additional equipment and opportunities may be available for the trainees.

Journal and Internet access

During the training period, the AITRP trainee has access to up-to-date medical journals and the Internet. Once training is over, the programme may allow the trainee to keep an email address and to have access to journals through the institution in the United States.

Professional networking support

The PIs who have established a network among their current and former fellows and mentors have found that this provides vital long-term support to trainees returning home. The AITRP network meetings are held regularly and include discussion about how to reinforce the relationships between trainees, PIs and mentors. The AITRP trainees also meet at international conferences.

Re-entry funding

Trainees have had opportunities to apply for funds (US\$ 25 000) to support their "re-entry" research projects as part of the AITRP grant. These awards provided bridge funding for the trainee upon returning home and allowed them to continue their research and to begin to establish themselves as independent researchers.

Support with writing grant applications

Successfully competing for funding can provide a trainee with the resources and the foundation on which to build a research laboratory. The AITRP may hold seminars on writing grant applications and many mentors provide advice and examples for their trainees.

Political strategies

Temporary visa

The AITRP trainees come to the United States under non-immigrant temporary visas. Most PIs will not support extension or renewal of these visas, thus preventing prolongation of trainees' stays in the United States.

Return agreements

Trainees are asked to sign a “condition of appointment” or return agreement prior to training that can be a valuable tool in encouraging them to return home.

Training for decision-makers in developing countries

Educating decision-makers about the importance of health research is an important step towards increasing the probability that such research will become a political priority. Short-term courses are the most appropriate method for training these decision-makers. This training should make administrators more aware and supportive of scientific research training, thus enhancing the environment to encourage talented people to return home.

Economic strategies

Repayment agreements

Some AITRP PIs require their trainees to sign repayment agreements stating that if trainees do not return to their home country, they will be responsible for repaying the cost of their training to the United States institution.

Letters of future job support

Some AITRP PIs require that trainees have positions in the field in which they were trained upon returning home. They do this by obtaining a letter of support from the sponsor in the developing country that describes potential positions that will be available after training.

Results and discussion

There are no good comparison groups for the average rate of return home of 80% reported for the 186 AITRP trainees who

came from 38 different low- and middle-income countries. However, the National Science Foundation, in their 2004 Science and Engineering Indicators Report, stated that, in 1998–2001, 54% of international science and engineering PhD students in the United States accepted firm offers to remain in the United States after receiving their degree (return rate of 46%). In another study, a return rate of 44% was reported for African students who were studying for a PhD in health sciences in Canada and the United States (2).

The AITRP has served as a model research-training programme for the FIC. However, there is no “one-size-fits-all” strategy available to counteract the complex phenomenon of brain drain. Furthermore, some aspects of the AITRP are unique. For example, because research on HIV/AIDS currently attracts a substantial amount of national and international funding, a trainee in this field may find it easier to obtain research funds and develop mentor networks. Also, because this research area is a high priority for the governments of many developing countries, jobs for trainees may be more easily secured upon their return to their home countries.

Clearly, everyone involved would benefit from a coordinated planning effort to reduce brain drain and to mitigate its effects. Further efforts are needed to engage representatives of all sectors, including the trainees themselves. Interested parties should meet to discuss this issue, to exchange “best practices” and to develop a comprehensive action plan. In addition to addressing a trainee’s physical return, it is essential to identify novel ways (e.g. partnerships, networks, alumni associations and virtual communities) that would achieve the “critical mass” of scientists required to provide the collegial community that is so important to retaining quality researchers in any country. ■

Conflicts of interest: none declared.

Résumé

Stratégies destinées à décourager l'exode des compétences

Pour acquérir des compétences en matière de recherche sanitaire, les personnels des pays en développement doivent souvent se former à l'étranger. Pour les organismes de financement de la recherche qui parrainent ce type de formation, un des buts majeurs est d'assurer que les chercheurs qui bénéficient d'une bourse de formation retourneront dans leur pays d'origine. Pour atteindre cet objectif, il faut faire appel à des stratégies qui prennent ce problème en compte dès le départ. Les stratégies décrites dans le présent article ont été élaborées dans le cadre du programme AITRP (programme international de formation et de recherche sur le SIDA (syndrome d'immunodéficience acquise)) destiné aux étudiants et chercheurs étrangers et financé par le Fogarty International Center (FIC) aux National Institutes of Health (Etats-Unis d'Amérique). Ce programme soutient les universités des Etats-Unis qui proposent

une formation à la recherche à des étudiants et chercheurs des pays en développement afin de leur donner les compétences nécessaires pour faire face à l'épidémie mondiale de VIH (virus de l'immunodéficience humaine)/SIDA et à l'épidémie de tuberculose qui l'accompagne. Le présent article décrit les stratégies employées par les responsables des programmes de recherche de cinq des AITRP les plus longs (financés pour 15 ans) pour décourager l'exode des compétences. Les bénéficiaires d'une bourse de longue durée dans le cadre de ces programmes sont restés pendant 11 à 96 mois (moyenne : 26 mois). En appliquant des stratégies de lutte contre l'exode des compétences reposant sur des bases scientifiques, politiques et économiques, les responsables des programmes AITRP ont obtenu un taux de retour des boursiers dans leur pays d'origine de 80 %.

Resumen

Estrategias para desalentar la fuga de cerebros

La ampliación de los conocimientos técnicos en materia de investigaciones sanitarias en los países en desarrollo exige a menudo que el personal de esos países reciba formación en el extranjero. Para los organismos de financiación de investigaciones que patrocinan este tipo de capacitación, un objetivo fundamental

es asegurar que las personas formadas regresen a su país de origen, y para lograr ese objetivo hay que emplear estrategias preventivas. Las estrategias aquí descritas se formularon en el marco de una iniciativa en régimen de enseñanza libre conocida como el Programa Internacional de Capacitación e Investigaciones

sobre el síndrome de inmunodeficiencia adquirida (SIDA) (AITRP), financiado por el Fogarty International Center (FIC) en los Institutos Nacionales de Salud (EE.UU.). Este programa apoya a universidades de los Estados Unidos que imparten formación investigadora a científicos de países en desarrollo para que puedan hacer frente a la epidemia mundial del virus de la inmunodeficiencia humana (VIH)/SIDA y a la tuberculosis asociada a la epidemia. En este artículo se describen las estrategias que para desalentar la fuga

de cerebros emplean los investigadores principales (IP) de cinco de los AITRP financiados durante más largo tiempo (15 años). Las personas que participaron en estos programas invirtieron en sus estudios entre 11 y 96 meses (26 meses como media). Valiéndose de estrategias científicas, políticas y económicas que abordan el problema de la fuga de cerebros, los IP que trabajan en los AITRP han logrado una tasa media de regreso al país de los cursillistas

ملخص

استراتيجيات للحد من هجرة العقول

البلدان النامية، لتمكينهم من التصدي للوباء العالمي لمرض الإيدز والعدوى بفيروسه ووباء السل المرتبط بالإيدز. وتصف هذه الورقة الاستراتيجيات المتبعة للحد من هجرة الباحثين الرئيسيين الذين شاركوا في خمسة من أطول البرامج الدولية للبحوث والتدريب في مجال مرض الإيدز (التي استمر تمويلها مدة ١٥ عاماً). وقد أمضى المتدربون في هذه البرامج الطويلة الأمد من ١١ شهراً إلى ٩٦ شهراً من الدراسة (بمتوسط ٢٦ شهراً). وأدت الاستراتيجيات العلمية والسياسية والاقتصادية للتصدي لقضية هجرة العقول إلى وصول المعدل المتوسط لعودة الباحثين الرئيسيين المتدربين في هذه البرامج إلى بلدانهم، إلى ٨٠٪.

الملخص: عادة ما يتطلب بناء خيرات العاملين في مجال البحوث الصحية في البلدان النامية حصولهم على التدريب خارج بلدانهم. ويتمثل أحد الأهداف الرئيسية للوكالات الممولة للبحوث، التي ترعى مثل هذا النمط من التدريب، في ضمان عودة المتدربين إلى بلدانهم لدى انتهاء التدريب. غير أن تحقيق هذا الهدف يستلزم تطبيق استراتيجيات استباقية. وقد تم وضع الاستراتيجيات التي تناولها هذه الدراسة وفقاً للبرنامج الدولي للتدريب والبحوث خارج الجامعات في مجال مكافحة مرض الإيدز، الذي يموله مركز فوغارتي الدولي في المعاهد الوطنية للصحة في الولايات المتحدة. ويقدم هذا البرنامج الدعم للجامعات الأمريكية التي تقدم برامج تدريبية على إجراء البحوث للعلماء من

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Round Table Discussion

Effectiveness of strategies for discouraging brain drain

Anna Whelan¹

The paper by Kupfer et al. raises an issue of great public health importance, namely, scientific brain drain, and describes how the authors' institution had developed strategies to stem it. The situation they describe is part of the larger issue of migration of skilled labour from low-income countries to high-income countries, commonly referred to as brain drain, which has been recognized internationally since the 1960s (1). Most of the studies on this topic have focused on the medical workforce, including nurses (2, 3), and less is known about flows of other health personnel such as research scientists, academics, laboratory technicians, radiographers. The magnitude of this problem for scientists and its impact on public health were not discussed by Kupfer et al; however, the available data relating to the migration of health personnel have recently been reviewed by the Regional Network for Equity in Health in Southern Africa (EQUINET) (4).

Kupfer et al. describe the approach taken by their institution, which for the five programmes they surveyed, resulted in a return rate for trainees of 80% (n = 186). It is unclear where

these trainees came from, whether they were able to utilize their new skills on their return home, whether they were satisfied with a range of factors (e.g. employment conditions and lifestyle) on return, and whether they remained in their home countries thereafter or subsequently migrated. Medium- and longer-term follow-up of trainees would provide useful information on which to base further action.

The paper by Kupfer et al. lists 14 strategies that had been used to "make a trainee's return to the home country more probable". While the results of this package of initiatives were impressive, an evaluation of the benefit of each of these strategies separately would provide other similar institutions with valuable information. Is there one particular strategy that is more effective, or are all 14 needed to improve the likelihood of return to the home country?

The first strategy listed, i.e. that "research is responsive to home country priorities", seems to be the linchpin. This is a sensitive issue that lower-income countries often find difficult to negotiate because these countries may be under pressure to make their priorities fit those of the external agencies. A key question is who is the initiator of the research proposal? If the trainee is to be supported to return home, then having a research agenda that genuinely reflects the priorities of his or her country is a fundamental requirement. For example, if the research is considered marginal, or beyond the capacity of the institutions of the home countries, the trainees may face frustration on return, and seek to emigrate so that they can utilize their new skills elsewhere. In other words, the issue of recognition of

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